NEGEA 2016 Annual Retreat
ABSTRACTS

WORKSHOPS

Workshop 1: Writing and Submitting a Successful NEGEA Grant Proposal

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Learning Objectives: At the conclusion of this workshop, participants will be able to: 1. Describe the requirements of the NEGEA grant program 2. Identify the characteristics of a competitive grant proposal 3. Discuss the common pitfalls in grant writing 4. Apply the processes described to begin the development of a grant submission
Methods/Approach: Busy clinicians and educators often face several barriers when attempting to develop and execute sound educational research1. Many of these barriers have been explored in the educational literature including a lack of expertise, time, and money2. Recognizing the importance of providing funding for researchers to develop and implement necessary research projects, the AAMC and the four regional groups of the Group on Educational Affairs (GEA) all provide funding for education research through an annual grant program. These funds are considered essential as they provide seed money to initiate research projects that seek to answer key educational questions and foster collaboration across individuals and institutions within a region. A key first step in defining high quality education research is improving the quality of proposals submitted to these funding pipelines and providing researchers with ample opportunities to seek guidance and mentorship3. Given the recent focus on increasing the quality of education research being conducted and submitted within the US4, this workshop is part of a larger national push to enhance the quality of education research projects being submitted to the NEGEA annual grant program using established resources in the existing literature5.
Session Outline (90 minutes):

Participants will begin the workshop with a brief introduction to the NEGEA grant program **(5 min).** This will include an overview of the intent of the program as well as a history of prior projects that have been funded and the scholarship produced as a result of these projects. Participants will also be introduced to the other regional and national grant programs with an emphasis on the importance of the programs as a pipeline to high-quality education research across the US. Participants will be asked at the beginning of the workshop to identify a possible project that they would want to submit to the upcoming grant cycle as we progress through the various activities.

Following the introduction, we will introduce a panel of prior grant recipients and reviewers (3 individuals maximum) who will share their experience including pitfalls and recommendations **(15 min).**

Next, participants will be broken into small groups and given an example of a grant proposal to review **(15 min).**

Using the same criteria given to grant reviewers, each small group will be asked to review the grant and provide feedback based on a hand-out that will list the review criteria. Each group will then report out to the large group **(15 min).**

Next, session facilitators will walk through each component of the call for proposals and provide specific feedback on each section based on reviews from prior years (10 min). Following this, participants will break into small groups to start the collaborative process of writing a grant proposal based on their individual ideas **(20 min).** We will specifically focus on problem statement, methodology, and evaluation/outcomes.

The session will close with a final Q&A and review of some of the projects discussed in the small groups **(10 min).** Participants will be provided with a list of resources for grant writing upon completion of the workshop.

References: 1. Cook DA, Beckman TJ, Bordage G. Quality of reporting of experimental studies in medical education: a systematic review. Med Educ 2007;41(8):737–745. 2. Yarris LM, Miller Juve A, Artino AR, Sullivan GM, Rougas S, Joyce B, Eva K. Expertise, time, money, mentoring, and reward: systemic barriers that limit education researcher productivity—proceedings from the AAMC GEA workshop. Journal of Graduate Medical Education 2014;6(3):430-36. 3. Yarris LM, Simpson D, Sullivan GM. How do you define high-quality education research? J Grad Med Educ 2013;5(2):180-1. 4. Artino AR Jr, West DC, Gusic ME. Foreword: The more things change, the more they stay the same. Acad Med 2015;90(11 Suppl):Si-Siii. 5. Blanco MA, Gruppen LD, Artino AR Jr, Uijtdehaage S, Szauter K, Durning SJ. How to write an educational research grant: AMEE Guide No. 101. Med Teach. 2015;2:1-10.

Workshop 2: IPE in the Clinic Setting: Optimizing Your Clinic and Teaching When You have Multiple Health Professions Trainees on Your Team

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N. Saks, J. Afram Rutgers Robert Wood Johnson Medical School
P. King University of Vermont College of Medicine
P.A. Findley Rutgers Robert Wood Johnson Medical School

Learning Objectives: At the conclusion of this workshop, participants will be able to: 1. Summarize challenges to teaching interprofessionally in the clinic setting. 2. Discuss best-practice methods for teaching in the interprofessional clinic. 3. Consider which assessment methods and faculty development models for IPE might be most successful at their institutions.

Methods/Approach: Interprofessional education (IPE) often stops in the classroom. However, the workplace is where learners can apply basic IPE principles and begin working collaboratively toward better patient outcomes (IPEC Expert Panel, 2011). However, several systemic issues pose significant barriers to effective workplace learning in IPE. Logistical issues include consideration of how many different learners can fit in a specific setting and whether schedules can be effectively aligned. Educational programs also have specific expectations for their learners which do not always match reality, including medical student supervision by a physician as primary contact and overlapping expectations of different roles such as those between MD and NP/PA learners. Administrative priorities also may be out of line with the educational objectives, including the concern that learners take time and would need electronic health record access when currently such systems are often partitioned by profession. In this workshop, participants will explore the barriers to, and solutions for, effective IPE in the clinic. They will then have the opportunity to work together in small groups to discuss best practices for clinical IPE in one of five areas. Participants will be asked to share their expertise and consider ways to enhance their programs. Information from this session, as well as similar workshops at the other regional GEA meetings, will be collated and returned to all participants for validation of the identified best practices.

Session Outline (90 minutes):

I. Introductions and Overview of Workshop (10m)

II.Overview of Challenges to IPE in the Clinic Setting (15m) III. Small-group discussion to generate best practices in five focal areas specific to learners in the clinical workplace (35m).

III. Participants will be asked to select one area during this portion; each small group will be facilitated by a workshop presenter.

1. Logistics/Facilities – How many trainees can be accommodated and do it well? Consider facilities, time, patient flow, etc. How do you orient your staff/engage your colleagues in interprofessional teaching?
2. Alignment with Clinic Priorities – How do you align goals to create "win/wins" for learners AND patient care?
3. Teaching Strategies/Approaches – What are the different ways interprofessional learners can be taught? How best could they be teamed to take care of patients? Is it possible to teach across professions (ie, an RN faculty teaching pharmacy learners)?
4. Assessment – Does peer evaluation work to measure teamwork, competence, professionalism, communication, etc? Where does direct observation of skills fit in?
5. Faculty Development – Are there existing faculty development models which could be repurposed to prepare faculty to teach IPE? Is their success dependent on specific local factors?

IV. Large-group presentation and discussion of SG work (20m).

V. Summary and Next Steps (5-10 min)

1. Distribute key references by each of 5 focal areas specific to IPE
2. Consider SIG on IPE
3. Collate key findings from each workgroup and circulate to participant. Note this information will be shared across regions and collated from workshops in other regions and shared back with participants in a national framework for validation.

References: Interprofessional Education Collaborative Expert Panel. Core Competencies for Interprofessional Collaborative Practice: Report of an Expert Panel. Washington, DC: Interprofessional Education Collaborative; 2011:1–56. World Health Organization (WHO). Framework for action on interprofessional education and collaborative practice. Geneva: World Health Organization; 2010. Accessed March 22, 2015.

Workshop 3: Professional Identity Formation: From Pedagogy to Practice

L. Coplit, T. Cassese Frank H. Netter School of Medicine at Quinnipiac University
S.A. Gaines, H. Wald Warren Alpert Medical School of Brown University

Learning Objectives: 1.Articulate the distinction between professionalism and professional identity formation in medical education and training 2.Discuss pedagogies and best practices from the region in making professional identity formation explicit 3.Collaborate with other participants to design new educational interventions or adapt existing curricular offerings that will help advance PIF as an explicit part of medical education and training in their own institutions

Methods/Approach: Since the 2010 publication of the Carnegie Foundation's Educating Physicians: A Call for Reform of Medical School and Residency (Cooke, Irby, O'Brien), professional identity formation (PIF) has become the focus of increased attention in medical education.1 Posited as one of four goals for educating future physicians, professional identity formation has been defined as "the transformative journey through which one integrates the knowledge, skills, values, and behaviors of a competent, humanistic physician with one's own

unique identity and core values." (Holden, et al, 2015). 2 At the 2015 Medical Education Meeting in Baltimore, the Group on Educational Affairs' (GEA's) Professional Identity Formation (PIF) Working Group led a workshop designed to explore specific strategies supporting the development of PIF in educational activities across the continuum of medical training. The topic that generated the most interest at this session was what Cruess and colleagues call one of the "educational implications and future directions" of the reframing of medical education to support PIF: making identity formation explicit in medical training. 3,4 The PIF Working Group of the GEA (Pamela Schaff, Chair) now proposes a workshop to be presented at each of the Spring Regional meetings where participants will be able to learn from several regional institutions that have developed educational strategies to make students aware of the concept of professional identity—to "engage learners as active participants in the process of identity formation and encourage them to trace their own progress though the journey."3 Participants will then work together to design interventions for implementation at their home institutions. Electronic proceedings will be made available to all participants (across all regions), and a report on progress of the resulting interventions will be delivered at the 2016 Medical Education Meeting.

Session Outline (90 minutes):

1. 5 minutes: introduction to define terms and introduce panelists
2. 20 minutes: representatives from two regional institutions will describe recent interventions that have focused on advancing PIF as an explicit instructional goal. Presenters from Brown will describe initiatives that address undergraduate and graduate PIF.
   a. Todd Cassese, MD, Course Director, Clinical Arts and Sciences, Frank H. Netter MD School of Medicine
   b. Hedy S. Wald, PhD, Director, Reflective Writing Curriculum, Family Medicine Clerkship, Warren Alpert Medical School of Brown University (UME Initiatives)
   c. Sarah Andrus Gaines, MD, Internal Medicine Follow-Up Rounds Course Director, Warren Alpert Medical School of Brown University (GME Initiatives)
3. 45 minutes: participants will work in small groups to design or modify a curricular element at their own institutions, or to share works in progress. Groups may be organized by particular pedagogies of interest, e.g., learning communities/mentoring, doctoring course elements, fostering resilience, reflective writing, use of e-portfolios and other interventions that influence PIF.5 Participants will use a worksheet designed to focus attention and facilitate development of their proposed interventions. A scribe at each table will capture key ideas.
4. 20 minutes: Report out from tables on the most promising (exciting and feasible) intervention identified at each table.

References: 1.Cooke, M., Irby, D., O'Brien, B. (2010). Educating Physicians: A Call for Reform of Medical School and Residency. San Francisco: Jossey-Bass. 2.Holden M. Buck, E., Clark, M., Luk, J., Ambriz, F., Boisaubin, E., Clark, M., Mihalic, A., Sadler, J., Sapire, K., Spike, J., Vince, A., Dalrymple, J. Professional Identity Formation: Creating a Longitudinal Framework Through TIME (Transformation in Medical Education). Acad Med.2015; 90: 761-767. 3.Cruess, R.L., Cruess, S.R., Boudreau, J.D., Snell, L., and Steinert, Y. Reframing Medical Education to Support Professional Identity Formation. Acad Med 2014; 89 (11), 1446-1451. Wald, HS. Professional Identity (Trans)Formation in Health Professions Education: Reflection, Relationship, Resilience. Invited Commentary - Special Theme Issue. Acad Med 2015; 90(6): 701-706. Goldie J. The formation of professional identity in medical students: Considerations for educators. Med Teach 2012; 34: e641-e648

Workshop 4: Faculty Development: Standardization of Faculty Teaching in Your Clinical Skills Course

J. Hojsak Icahn School of Medicine at Mount Sinai
R.K. Ovitsh SUNY Downstate College of Medicine
A. Fornari Hofstra Northwell School of Medicine

Learning Objectives: The learning objectives are to identify teaching methods that do and do not foster dynamic small group learning, to utilize developed small group vignettes for generating an open discussion among clinical skills faculty, to share challenges met in developing clinical skills faculty, and to augment a clinical skills toolbox for use in individual medical school clinical skills courses.

Methods/Approach: Clinical skills courses for medical students in the early years of medical school training are often taught by a diverse group of multidisciplinary faculty. These faculty are skilled clinicians who vary in their experience as educators and facilitators of adult learners. Assuring that all clinical faculty develop and utilize the skills of questioning, listening, responding, and explaining, in order to foster teamwork and collaborative learning, is key for effective small group dynamics. (1) Developing diverse facilitators, with the goal of providing a standardized small group experience for students, can be challenging. In this workshop presenters from three different institutions with expertise in directing clinical skills courses will discuss effective development of small group faculty, resulting in standardization of the clinical skills curriculum and the student experience.

Session Outline (90 minutes):

Introduction: 10 minutes Workshop leaders Identification of participants with respect to experience in faculty development. Arrange discussion groups with a mix of levels of experience.

Coaching Strategies: 15 minutes Powerpoint and discussion regarding the attributes of an effective small group facilitator.

Introduction of the Developed Vignettes: 5 minutes

Case discussion: 20 minutes Participants work in arranged small groups. Participants will be encouraged to share their own challenges in developing small group faculty. Workshop facilitators will each join a discussion group.

Vignette debrief: 20 minutes Discuss the cases and solutions developed by each group.

Taking it Home: 15 minutes What other issues occur at individual institutions that prevent standardization of faculty development? How can these be discussed with faculty in a manner that fosters collective problem-solving and avoids finger pointing? How might these issues be developed into vignettes for faculty development?

Conclusion: 5 minutes Distribution of take-home materials: references, checklist, one-minute paper.

References: 1. Edmuds S, Brown G. Effective Small group learning: AMEE Guide No. 48. Med Teach. 2010; 32 (9): 715-26.

Workshop 5: The Core EPAs in Action: Lessons from the Pilot Schools

J. Amiel, M. Thomashow, P. Locks Columbia University College of Physicians and Surgeons
A. Langer New York University School of Medicine

Learning Objectives: The purpose for this workshop is to share early experiences from the implementation of the Core EPA curricula, assessment and entrustment processes at the ten AAMC Core EPA pilot schools and to engage medical educators at schools implementing EPA-based systems and those considering using EPAs in their curricula in a discussion about their opportunities and challenges. Specifically, by the end of the workshop, we expect that participants will be able to: 1. Describe the ways the Core EPAs can increase confidence among residents, patients and program directors regarding what each resident can be relied upon to do at entry to internship. 2. Describe the thirteen core EPAs and the guiding principles of the Core EPA pilot. 3. Describe the three components of trustworthiness (truthfulness, conscientiousness and discernment) and their role in entrustment. 4. Describe the range of supervisory levels and its relationship to entrustment. 5. Apply the Core EPA construct and its systems-based checklist to work underway at their home institutions.

Methods/Approach: (In addition to the authors listed, we will have other faculty from pilot schools in NEGEA) Over the past ten years, the momentum to develop and implement competency-based curricula in medical education has reached an important threshold and now theory is rapidly translating to practice. The construct of Entrustable Professional Activities (EPAs) has helped catalyze this transformation because it places trust at the center of the education mission and links what patients should trust their physicians to do with what teachers must entrust their learners to do with less and less supervision over the course of their training. In undergraduate medical education, a group convened by the AAMC has articulated the Core EPAs: those activities that all residents should be trusted to perform without direct supervision on their first day. Now that the Core EPAs have been published, medical schools are grappling with ways to implement competency-based curricula using the Core EPAs. A group of ten schools, again convened by the AAMC, is in the midst of piloting the Core EPAs and developing best practices for their implementation.

Session Outline (90 minutes):

30 minutes: The session will begin with a brief review of the Core EPA pilot, including the mission of the project, the thirteen EPAs themselves, the guiding principles of the pilot and the constructs of trustworthiness and supervisory levels. Though we acknowledge this is not particularly interactive, our experience with colleagues is that there remains notable variability in awareness and use of the foundational terminology used to describe EPA-based work that is leading to confusion. We believe spending some time on definitions to ensure consistency is very important.

30 minutes: Work as a group to conceptualize how EPA 1 (obtaining history and physical) may be taught, assessed and entrusted, using the curricula of schools represented by attendees (i.e., a traditional 2+2 school, a shortened-preclinical school, a school using longitudinal integrated clerkships, etc.)

30 minutes: Discuss anticipated challenges (faculty development, resources for coaching and data management, remediation) and brainstorm approaches to them.

References: Core Entrustable Professional Activities for Entering Residency: Curriculum Developers' Guide. Timothy Flynn, et al. 2014 Curriculum development for the workplace using Entrustable Professional Activities (EPAs): AMEE Guide No. 99. Olle ten Cate, Huiju Carrie Chen, Reinier G. Hoff, Harm Peters, Harold Bok, Marieke van der Schaaf. Medical Teacher : 1–20. Posted online on 14 Jul 2015.

Workshop 6: The Leadership Education and Development (LEAD) Program: Graduates Share How They Applied LEAD Learning to Individual Workplace Settings

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S.W. Chauvin LSUHealth – New Orleans
B. Thompson, Penn State University College of Medicine

Learning Objectives: At the end of this session, participants will be able to: Describe the components of the LEAD program. Explore the educational leadership domains of setting direction, developing people, developing organizations, and managing and administering. Appraise the various focused applications completed by the LEAD graduates. Apply the examples and lessons learned from others to his/her own situation.

Methods/Approach: The Leadership Education and Development (LEAD) certificate program was created in 2009 with support from the SGEA, expanded to the CGEA in 2011, and in 2013 was implemented in all four GEA regions. At the 2016 spring meeting, faculty who completed the 2014-16 nation-wide program will graduate. This session will provide an opportunity for LEAD graduates in this region to present their experiences, and in particular, how they applied their LEAD learning to as specific workplace situation (i.e., their personalized LEAD Applied Leadership Focus). The session will culminate their two-year learning commitment and provide opportunities for others who are interested in leadership development to explore the LEAD program and its conceptual framework that is comprised of four domains. The LEAD program was designed specifically for medical educators already in a mid-level educational leadership position or those aspiring for leadership positions. The LEAD program focuses on the following educational leadership competencies: setting direction, developing people, developing organizations, and managing and administering. As a cohort, the LEAD Fellows completed workshops at the annual regional GEA meeting. Throughout the year, each Fellow interacts regularly with a LEAD faculty advisor and a local coach. As a cohort, they interact with LEAD faculty and each other through quarterly intersessions via teleconference. LEAD Fellows also complete periodic self-directed assignments and reflective exercises. A key component of each Fellow's portfolio is the inclusion of an Applied Leadership Focus that is completed in Year 2 to apply what is being learned in LEAD to a specific aspect of the Fellow's local leadership context. Through roundtable discussions with audience members, the LEAD graduates will use their Applied Leadership Focus experiences to discuss leadership development experiences in LEAD.

Session Outline (90 minutes): This interactive session will be comprised of 2-3 LEAD graduates seated at each of several tables who will be joined LEAD faculty and session participants. After a brief introduction and using a round-robin format, the LEAD graduates will rotate every 15 minutes to a different LEAD graduate roundtable every 15 minutes. The session will conclude with a large group summary. Each graduating Fellow will provide a one-page summary of his/her Applied Leadership Focus that includes a description and rationale, implementation and insights, and how the graduate plans to continue his/her leadership development,

1. Introduction (5 minutes) Explanation of the session format Overview of the LEAD program Introduction of the LEAD faculty Introduction of LEAD graduating Fellows
2. Round-robin Table Discussions: Participants engage in a 15-minute roundtable discussion with 2-3 LEAD graduates. Graduates will then move to a different table every 15 minutes. (5 15-minute rotations with transition time between rotations = 75 minutes) Within each roundtable discussion, the LEAD graduates will provide an overview of his/her Applied Leadership Focus and LEAD activities, reflecting the four leadership domains: setting direction, developing people, developing organizations, and managing and administering. Session

participants will be invited to ask questions and share experiences and views regarding leadership development.

3. Wrap-Up/Closure: The session will conclude with a large group debriefing and summary of key points. (5 minutes)

References: 1AAMC Leadership Course Catalog. Accessed April 1, 2014 from https://www.aamc.org/members/leadership/catalog/. 2Chauvin SW. Leadership Education and Development (LEAD) Certificate Program: Conceptual Framework and Evidence Base. Washington DC: Association of American Medical Colleges, 2009. 3Chauvin SW, Thompson B. Leadership Education and Development (LEAD) Certificate

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Workshop 7: Converting Your Teaching and Assessment Materials into Educational Scholarship through MedEdPORTAL

H. Kittel
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Learning Objectives: Participants will be able to: 1. Describe the differences between the MedEdPORTAL services: Publications, iCollaborative, and CE Directory. 2. Delineate the steps to submit an educational resource for publication in MedEdPORTAL Publications. 3. Interpret and address MedEdPORTAL's Publications peer review criteria. 4. Cite and demonstrate the impact of MedEdPORTAL Publications as an example of educational scholarship.

Background/Purpose of Workshop In this interactive workshop, attendees will engage with the MedEdPORTAL editorial staff while participating in hands-on exercises designed to help educators turn their materials into peer-reviewed publications that can be used for educational scholarship and promotion. MedEdPORTAL (www.mededportal.org) is a free, global online service that consists of Publications, iCollaborative and the CE Directory. Participants will learn about the entire submission to publication process and the criteria1 used to evaluate the scholarly value of their materials. The workshop will include a series of audience-led discussions and activities to determine the "best fit" for various types of educational and assessment resources, with an emphasis on publishing. After reviewing criteria related to copyright and the protection of patient privacy, participants will apply these criteria in a problem solving exercise. The audience will then discuss the value of educational scholarship in small groups, specifically how to apply scholarly criteria when submitting materials to MedEdPORTAL for peer review. The presenters will focus on the Educational Summary Report (ESR), a newly required submission component that provides a summary overview of the entire submission, and will conclude with a discussion how to document publication on one's curriculum vitae. Having walked through the entire process from submission to publication, participants will leave with the tools to publish, cite and demonstrate the impact of their educational work.

Session Outline (90 minutes): Structure of 90 Minute Workshop:

05 Minutes: Introductions
10 Minutes: Presentation – Overview of MedEdPORTAL
10 Minutes: Small Group Exercise – Determine which resources belong in each service
10 Minutes: Presentation – Copyright and patient privacy criteria
10 Minutes: Small Group Exercise – Applying copyright and patient privacy criteria
15 Minutes: Presentation – Peer review criteria and defining educational scholarship (Educational Summary Report)
15 Minutes: Small Group Exercise – Applying peer review criteria
10 Minutes: Presentation – Publishing, citing, and demonstrating impact
05 Minutes: Wrap-up and questions

Rationale and Timeliness In an effort to further strengthen the impact of MedEdPORTAL Publications, we are making strides towards achieving our biggest goal yet. In 2016, we plan to submit an application to the National Library of Medicine for indexing status in MEDLINE and inclusion in the PubMed database. Many of our authors are health educators who choose to publish in MedEdPORTAL as a way to disseminate their high-quality educational material to others around the world—for free. MedEdPORTAL is also a platform for these educators to receive recognition for works of educational scholarship, yet we continue to hear from our authors that inclusion in PubMed/MEDLINE would increase the likelihood that our publications count as compelling scholarly contributions that can support promotion and tenure. We've spent much of the past year working with a consultant on how to revise our journal with an eye to being indexed among the top names in biomedical literature. While we know the content we publish is high quality—a result of our rigorous screening and peer review process—we are always looking for ways to increase the numbers of educators who access our materials and to improve the experience of using them in teaching and learning environments. As part of our plan to widen MedEdPORTAL's reach, we will now attempt to improve the visual identity of our final product, the publication itself. As of November 15, 2015, all authors are now required to develop an Educational Summary Report (ESR) as part of their submission to MedEdPORTAL Publications. The ESR provides a summary overview of the entire submission and serves as a guide for understanding the purpose and scope of the resource. The ESR replaces the Instructor Guide. Authors should be aware that a MedEdPORTAL publication will consist of the ESR and all component resources contained within the submission. Authors will be provided with a template that contains detailed guidance, and staff will prepare the ESR for publication upon acceptance. While inclusion in PubMed/MEDLINE is our immediate focus, the enhancement of our final publication will undoubtedly have greater impact. Regardless of the outcome of the application to the National Library of Medicine, the addition of the ESR and our emphasis on continuous improvement will increase the quality and value of our journal to current and potential users. Intended Audience Health professions faculty, administrators, and students

References: Glassick, C., Huber, M., & Maeroff, G. Scholarship assessed. 1997. San Francisco, CA: Jossey Bass.

Workshop 8: The Mentors Matter Workshop: Group Peer Mentoring As A Way To Improve Career Vitality Among Academic Physicians

S. Wretzel, R. Belforti, R. Starr, O. Torres
Baystate Medical Center

Learning Objectives: ● Enumerate the importance of mentoring and it's relationship to career vitality ● Describe the differences between traditional mentoring and group peer mentoring and be able to explain the importance of peer mentoring ● Engage in a group peer mentoring experience exploring the importance of values in one's career ● Illustrate the ways in which group peer mentoring could improve career vitality among academic physicians in participant's home institutions

Methods/Approach: Having a mentor has been significantly associated with increased research productivity, higher rates of promotion, and increased retention rates of junior faculty.1, 2 Further, people with mentors are more likely to have an increased perception of career success and vitality.3, 4 However, traditional mentoring models in which a person with more experience mentors someone with less experience can be fraught with problems. First, finding a mentor can be difficult. Second, a mentor may not be able to provide guidance in all of the areas that a mentee needs, necessitating a larger mentoring network for the mentee. Third, and most

importantly, mentoring within a hierarchical schema may pose barriers to honest, two-way feedback with the goal of improving the mentee's career.5 Group peer mentoring was designed as a way to address these issues. Group peer mentoring allows individuals of equal rank and experience to mentor each other. The absence of inequality allows for mutual feedback on issues of career planning and career success.5 Mentorship and career vitality are key components for educators to provide the best educational and career experiences to medical students and residents. In the Department of Medicine at Baystate Medical Center, a group peer mentoring program called "Mentors Matter" was developed and implemented for mid-career faculty as a means to increase mentorship within the department, as well as career vitality for faculty. We will describe Mentors Matters, a 10-month program that incorporates mentorship skills building, promotion preparation, scholarly activity support, and work life balance advice for faculty.

Session Outline (90 minutes):

1. Introduction to Group Peer Mentoring and benefits to mentorship including job satisfaction, retention, promotion, productivity and career vitality. (Sharon Wretzel) **15 minutes**

2. Peer Group Mentoring Exercise (Small Group Facilitators: Sharon Wretzel, Raquel Belforti, Rebecca Starr, Samuel Borden). Participants will be divided into small groups of 5-6 based on their career level (ie. 1-5 years, 6-10 years, >10 years). The small groups will be facilitated through an exercise on value identification. The small groups will then be facilitated through a discussion on their results and how these can better be achieved in their career. During this exercise participants will be actively mentoring each other. At the end of this group peer mentoring experience, participants should be able to identify at least one new or improved mentoring skill such as active listening or improved methods of feedback. **60 minutes**

3. Large Group Discussion (Raquel Belforti) After experiencing the power of group peer mentoring, the groups will come together to discuss their experience with group peer mentoring, as well as explore and discuss how group peer mentoring can be brought back to their own institutions. **15 minutes**

Deliverable: Each participant will be provided with a "Group Peer Mentoring Start Tool Kit." This includes topics, readings and activities for group peer mentoring sessions including: -What makes a good mentor -Career development -Academic promotion -Getting the right work done -Getting what we want -Vitality -Teaching -Leadership -Work Life Balance

References: 1 Morrsion LJ, et. al. " Impact of a Formal Mentoring Program on Academic Promoton of Department of Medicine Faculty: A Comparative Study" Med Teach 2014 July: 36(7) 608-14 2 Sambunjak D, et. al. "Mentoring in Academic Medicine: A Systematic Review" JAMA. 2006; 296: 1103-1115. 3 Allen TD et. al. "Career Success Outcomes Associated With Mentoring Others: A Comparison of Mentors and Nonmentors" J Career Devel 2006 32:3 272-285 4 Pololi LH et. al. "Faculty Vitality – Surviving the Challenges Facing Academic Health Centers: A National Survey of Medical Faculty" Academic Medicine 2015: 90 (7) 835 – 997. 5 Pololi L et. al. "Mentoring Faculty in Academic Medicine" J Gen Intern Med 2005; 20: 866-870.

Workshop 9: How to Respond to and Incorporate Feedback from Trainees

S. Warrier, S. Rougas, K. Cahill, E. Green, S. Elisseou, S. Michael
Warren Alpert Medical School of Brown University

Learning Objectives: 1. Describe the "culture of feedback" for faculty in medical education 2. Identify strategies for responding to and incorporating different types of feedback 3. Develop strategies for those in leadership positions to effectively relay feedback to educators

Methods/Approach: Medical faculty members are asked to provide specific, timely, and professional feedback to their learners (1). However, few receive training about how to respond to and incorporate feedback from learners (2). Some guidance about how to incorporate

feedback can be found in the higher education literature and focuses mainly on obtaining feedback from learners in a structured fashion (3, 4). This still leaves educators ill-equipped to respond to feedback once they obtain it (5). Despite this, faculty members are asked to facilitate learning and improve the learner experience while being responsive to anonymous, often time-delayed evaluations. These expectations, however, ignore the emotional impact of negative feedback on dedicated educators and the many barriers to implementing real changes in teaching practice. Medical educators in leadership roles have the additional responsibility of having to convey learner feedback to colleagues who teach in their course, clerkship, or residency program. These medical education leaders are often asked to relay both reinforcing and corrective learner feedback to seasoned and invested educators – and must do so in a way that encourages these educators to improve their practice, not discourage them from teaching. Decisions about how to frame the feedback, the format in which to best deliver it, and ways in which to best support fellow educators in making changes to instruction are complex and fraught with personal and professional considerations. In this workshop, participants will describe the culture of feedback in medical education and identify strategies for educators to respond to and incorporate feedback. The workshop will have a specific focus on helping medical education leaders develop strategies to relay learner feedback to colleagues and to support those colleagues in their instructional practice. Participants will apply these strategies to cases through discussion in small groups. Participants will also discuss how to disseminate these strategies to colleagues at their own institutions and use feedback to support professional advancement.

Session Outline (90 minutes):

The workshop will begin with an introduction to the culture of feedback for medical educators (5 minutes).

Next, participants will review strategies for processing feedback as educators in the large group (10 minutes). Participants will then be broken into small groups to discuss 2 cases, utilizing the strategies discussed.

Each group will then report out to the large group (25 min).

Next, participants will return to the large group format to review leadership strategies for relaying feedback to colleagues (10 min).

Then, participants will discuss an additional case in small groups, using the strategies discussed, and report out to the large group (20 min).

Finally, the large group will reconvene to troubleshoot barriers to helping educators respond to and implement feedback from learners, and discuss professional advancement and further exploration of helpful strategies (20 min).

References: 1. Ramani S, Krackov SK. Twelve tips for giving feedback effectively in the clinical environment. Med Teach 2012;34(10):787-91. 2. Algiraigri AH. Ten tips for receiving feedback effectively in clinical practice.Med Educ Online 2014;19:25141. 3. Seldin, Peter, Using Student Feedback to Improve Teaching" (1997). To Improve the Academy. Paper 393. http://digitalcommons.unl.edu/podimproveacad/393 4. Morgan, P., The Course Improvement Flowchart: A description of a tool and process for the evaluation of university teaching, Journal of University Teaching & Learning Practice, 5(2), 2008. Available at: http://ro.uow.edu.au/jutlp/vol5/iss2/2 5. Fromme H, Mariani A, Zegarek M, Swearingen S, Schumann S, Ryan M, Reddy S. Utilizing Feedback: Helping Learners Make Sense of the Feedback They Get. MedEdPORTAL Publications; 2015. Available from: https://www.mededportal.org/publication/10159

Workshop 10: Strategies to Avoid Common Statistical Errors in Medical Education Research

S. Ramesh
Tufts University School of Medicine

Learning Objectives: At the end of the session, participants will be able to: - Choose appropriate statistical methods for use to conduct medical education research - Identify common statistical errors while reviewing medical education research papers

Methods/Approach: Basic knowledge of statistics is essential for conducting and understanding both quantitative and qualitative research. Recent advances in statistical methodology and statistical software programs have resulted in the increased use of statistics in medical research2. Despite the increase in computing power and data analytic techniques, statistical errors are common in medical education research and some popular journals 1, 3. This suggests a need to think about ways to improve statistical thinking and avoid the common statistical pitfalls in medical education research. The goals of this session are to engage participants in identifying and discussing most common statistical errors in medical education research design, data analysis, interpretation and reporting of results, and suggest simple solutions to avoid such statistical errors.

Session Outline (90 minutes):

- Introduction. (5 minutes)
- Group brainstorming activity: As a reader, what are the common problems you come across while reading the methodology and analysis sections in a quantitative medical education research article? (10 minutes)
- Interactive presentation on common errors in the data collection, analytical methods, interpretation and documentation of findings. (15minutes)
- Small group exercise 1: Each small group will be given a sample medical education research article and a checklist to identify the errors. They will then report their comments to large group for discussion. (15 minutes)
-Interactive presentation on simple solutions to avoid statistical errors. (15 minutes)
- Small group exercise 2: Participants will do a statistical evaluation of a sample research paper to provide feedback to the researcher while applying the solutions presented (20 minutes)
- Recap of session. (10 minutes)

References: 1. Fernandes-Taylor, S., J. K. Hyun, R. N. Reeder, and A. H. S. Harris. 2011. Common statistical and research design problems in manuscripts submitted to high-impact medical journals. BMC Research Notes 4:304. 2. Matthew S. Thiese, Zachary C. Arnold, Skyler D. Walker. The misuse and abuse of statistics in biomedical research. Biochemia Medica 2015; 25(1):5-11. 3. Strasak, A. M., Q. Zaman, G. Marinell, K. P. Pfeiffer, and H. Ulmer. 2007. The use of statistics in medical research. American Statistician 61:47–55.

Workshop 11: Creating a Culture of Support: How to foster mental health and prevent burnout in medical students and resident trainees

L. Karp, M. Chiu, S. Warrier
Warren Alpert Medical School of Brown University

Learning Objectives: 1. Review current research on medical student and resident mental health issues, the impact of burnout and depression on training, and interventions that have been studied. 2. Share, examine, and build upon current individual and systems-level interventions employed by participants' home programs. 3. Brainstorm innovative strategies that medical educators can employ to change the culture of medicine.

Methods/Approach: Medical trainees experience depression, burnout, and suicide at higher rates than the general population (Schwenk et al, 2010), which negatively impacts their ability to maintain professionalism, empathy, and patient safety (Drybye et al, 2006). Burnout prevention programs have been studied in the medical training setting, including those related to mindfulness and discussion groups, but it has been challenging to assess their overall impact due to small sample size and inadequate follow-up on long-term effects (Siralkar et al, 2013). Additionally, though individual-level interventions are essential, they are not sufficient, and there has been a recent movement in medical education literature towards creating systems-level initiatives (Watling et al, 2015). This workshop will bring together trainees and faculty to examine the methods that medical schools and residency programs use to foster the mental health of their trainees, and to brainstorm innovative ways to create systems-level change. To allow for cross-pollination between programs, participants will be separated into groups by areas of focus: pre-clinical training, clerkship programs, and residency programs. Participants will be asked to reflect upon their institutions' strengths and weaknesses in supporting trainee mental wellbeing. Lastly, each participant will create an action plan for their home institution that incorporates the strategies developed in the workshop.

Session Outline (90 minutes):

10 min: Written exercise Written exercise placed at table, to be completed as participants enter.

For faculty: 1. Reflect back to your time in medical school and residency: What were the top 1-3 obstacles to maintaining your mental health during training? What were the top 1-3 methods employed by your training programs (intentional or not) that helped prevent burnout and maintain your mental wellbeing? 2. When reflecting on the current state of training, can you identify ways in which the culture of medicine has evolved to create different challenges to maintaining mental health in training?

For medical students and residents: 1. What are the top 1-3 current obstacles to maintaining your mental health in training? 2. What are the top 1-3 methods employed by your training programs (intentional or not) that help prevent burnout and maintain mental wellbeing? 3. Can you identify ways in which the culture of medicine creates challenges to maintaining mental health in training?

20 min: Brief power-point presentation Brief power-point presentation of the current research on medical student and resident mental health issues, the impact of burnout and depression on training, and individual and systems-level interventions.

30 min: Small group discussion Break into 3 small groups

1. Pre-clinical medical students and faculty,
2. Clinical medical students and faculty,
3. Residency program trainees and faculty.

Introductions: Name, home institution, briefly why you chose to attend this workshop. Discussion questions: 1. Share your answers from the written exercise. 2. Faculty, what are your perceived strengths and weaknesses in supporting your trainees' mental health at your home institutions? What successful programs do you have in place that you would recommend to other institutions? 3. Trainees, what do you perceive to be the strengths and weaknesses of your home institutions' ability to address mental health needs? What additional feedback would you like to give your faculty about these issues? 4. Allow time for participants from different institutions to exchange ideas and give feedback.

10 min: Large group discussion Come together for large group discussion to brainstorm systems-level changes. Discussion questions: 1. Write on white board suggestions for systems-level changes (for example: pass/fail grading system, AOA timing, duty hours, maltreatment feedback, reflection and peer support as part of the required curriculum, suicide prevention training for faculty), ask participants for additional contributions. 2. Discuss advantages and limitations of these proposed interventions. 3. Additional questions if time allows: Should burnout prevention be an intentional aspect of training? How do administrators train faculty in a way that supports this endeavor? What can we do to measure our impact?

20 min: Action plans Return to small groups for development of action plans 1. Decide on 1-2 changes faculty and trainees would like to make at their home institutions. 2. Brainstorm required steps (for example: contact other administrators, obtain training for Healer's Art or Balint groups, create student feedback surveys) 3. Create timeline for implementation of changes

References: Drybye LN, Thomas MR, Shanafelt TD. Systematic Review of Depression, Anxiety, and Other Indicators of Psychological Distress Among U.S. and Canadian Medical Students. Acad Med. 2006; 81:354-373. Kotter, T, Pohontsch, NJ, Voltmer, E. Stressors and starting points for health-promoting interventions in medical school from the students' perspective: a qualitative study. Prospect Med Educ. 2015; 4:128-135. Schwenk TL, Davis L, Wimsatt LA. Depression, stigma, and suicidal ideation in medical students. JAMA. 2010;304:1173-1177 Shiralkar, MT, Harris TB, Eddins-Folensbee FF, et al. A Systematic Review of Stress-Management Programs for Medical Students. Acad Psychiatry. 2013;37:158-164.

Workshop 12: Instructional Methods to Promote Cognitive Integration of Basic Science and Clinical Medicine

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L. Fall Dartmouth Medical School

Learning Objectives: Following completion of the workshop, participants will be able to: 1. Explain the rational for the integration of basic sciences into clinical curriculum. 2. Identify basic science concepts within clinical cases and how cognitive integration can be facilitated through clinical reasoning and advanced problem solving. 3. Design strategies to create integrated basic science and clinical medicine educational sessions, including case design and intentional educational methods. 4. Plan for innovations to incorporate basic science and clinical medicine integration teaching materials into a curriculum.

Methods/Approach: The integration of basic science and clinical knowledge within medical school curriculum has been increasingly emphasized within the medical education community. The implementation of an integrated curriculum is a step-wise evolutionary process as indicated through Harden's Integration Ladder.1 Successful development of an integrated curriculum should involve the alignment of course goals with that of the program, and session learning objectives should reflect the course rationale.2 The process of basic science and clinical integration within medical curriculum requires a large effort in planning, communication, coordination, and time from faculty involved in the course development and implementation.1,2 Additionally, in order for cognitive integration to occur within the mind of the student, curricular innovations should activate student critical thinking, and interweave basic science with clinical medicine concepts.1-4 This workshop will provide participants with resources and discussion

regarding the process and design for curricular innovations involving basic science and clinical medicine integration.

Session Outline (90 minutes):

Introduction (10 Minutes): A brief introduction into the rationale behind the importance of the integration of basic science and clinical medicine in medical student education will be given using didactic format with informational slides.

Break Out Groups (25 Minutes): In small groups, participants will recognize and discuss the basic science concepts embedded within an example clinical case. Groups will be asked to identify the importance of those basic science concepts in relation to clinical reasoning and student learning. Each group will then create a single collaborative mini-case, and highlight pertinent basic science concepts. Several higher order learning objectives regarding the basic science and clinical integration will be formulated by the group. A handout with higher order learning objective verbs will be distributed.

Didactic Interlude (10 Minutes): A brief didactic will be shared with informational slides regarding interactive educational methods and strategies for implementing integrated basic science and clinical medicine learning. Current examples from medical school curriculum will be shared.

Break Out Groups (25 Minutes): In small groups, participants will discuss ways to incorporate the previously created case into the clinical curriculum. This discussion will include consideration of educational methods, training level of learners, and specific clinical environments.

End of Session Wrap Up (10 Minutes): A session review and recap will be provided with time for remaining questions from participants.

References: 1. Hartman, R. M. “The Integration Ladder:A Tool for Curriculum Planning and Evaluation.” Med Educ 2000;34:551-557. 2. Goldman, E. and Schroth, W. S. “Deconstructing Integration: A Framework for the Rational Application of Integration as a Guiding Curricular Strategy.” Acad Med 2012;87:1-6. 3. Kulasegaram, K. M., Martimianakis, M. A., et al. “Cognition Before Curriculum:Rethinking the Integration of Basic Science and Clinical Learning.” Acad Med 2013;88:1578-1585. 4. Kulasegaram, K., Manzone, J. C., et al. “Cause and Effect: Testing a Mechanism and Method for the Cognitive Integration of Basic Science.” Acad Med 2015;90:S63-S69.

Workshop 13: Minimizing Harm, A Novel Approach to Teaching Safety Using a Team Based, Inter-professional Simulation Model in Residency Training

N. Goolsarran, C. Hamo, W. Hsin-Lu, S. Frawley, C. Rowe, S. Lane
Stony Brook University School of Medicine

Objectives: The objectives of this workshop align with ACGME milestones, CLER patient safety/transitions pathways, and National Patient Safety Goals. The simulated training teaches concepts adapted from AHRQ TeamSTEPPS, an evidence-based collaborative approach to prevent medical errors. By the end of the workshop, participants will be able to: 1) Utilize simulation and team-based learning (TBL) concepts to effectively teach patient safety using an interprofessional simulation exercise 2) Adapt tools and templates provided to design and create a simulation experience to promote safe and quality patient care among in-training healthcare professionals including nurses (or other healthcare professionals) and internal medicine residents. 3) Integrate key principles and practices of patient safety using concepts from AHRQ Team STEPPS high reliability model across existing patient safety curricula

Methods/Approach: The Accreditation Council of Graduate Medical Education Clinical Learning Environment Review Program (ACGME CLER) mandates formal education in patient safety. Module based e-learning, power point didactics, and other passive learning techniques have traditionally been used to teach patient safety, resulting in less than optimal knowledge retention and learner satisfaction. This workshop will present an innovative way to teach safety using team-based learning (TBL) in an interprofessional setting using simulation of actual errors. Presenters will provide participants with tools to design an interprofessional, TBL simulation experience to promote safe and quality patient care among in-training healthcare professionals including nurses (or other healthcare professionals) and internal medicine residents. Communication is commonly the root cause of medical errors. Teaching and learning patient safety and quality care requires both the understanding of concepts and principles, and the demonstration of teamwork and communication skills. Team science is an interprofessional science in which team members with training and expertise in different fields work collaboratively to integrate resources and enhance perspectives. Ideally, teaching safety should involve direct hands-on training in a team-based manner with involvement of other healthcare professionals. Furthermore, too few opportunities exist that systematically bring faculty and trainees from multiple disciplines together in a meaningful way for the purpose of improving safety and quality of patient care. Presenters will demonstrate their approach using a simulation/standardized patient (SP) application case model, which allows trainees to participate in simulated errors and post-scenario debriefing. This activity is a grant funded TBL activity, which demonstrates a unique approach to teach safety in an interactive way. This activity allows team members to review and appraise their performance and create action plans to decrease the probability of future errors.

Session Outline (90 minutes): The TBL experience will revolve around three different case scenarios including (1) Medication Error-A Case of Overdose (2) Effective Hand-offs and (3) Patient Education Teach Back. Workshop participants will view short clips of recorded simulated interprofessional scenarios and participate in small group discussions and activities. Participants will use a checklist to identify key patient safety and quality concepts as well as opportunities for interprofessional collaboration. The audience will then align concepts from the scenarios to the relevant ACGME milestones, CLER pathways, and National Patient Safety Goals Interactive Activities

30 minutes Introduction, sharing our experience, our data, and materials/props needed

30 minutes Small group exercise where participants will view three short clips of recorded simulated interprofessional scenarios and use a checklist to identify key patient safety and quality concepts covered in each scenario

20 minutes Participants will then match concepts from the scenarios to the relevant ACGME milestones, CLER pathways, and National Patient Safety Goals

10 minutes Wrap up and questions/answersLearning

References: Sweet, M. & Michaelsen, L. (2012). Team-based learning in the social sciences and humanities: Group work that works to generate critical thinking and engagement. Sterling, Virginia: Stylus Publishing. Institute of Medicine. Crossing the Quality Chasm: A New Health System for the 21st Century. (2001). Washington, DC: National Academies Press.

Workshop 14: A User Friendly Approach to Writing Narrative Comments of Medical Student Performance

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M.S. Grayson, D.C. Myers Albert Einstein College of Medicine of Yeshiva University

Learning Objectives: By the end of the session, participants will be able to: ● Recognize the value of providing narrative feedback to learners ● Identify characteristics of effective narratives ● Identify student attitudes, behaviors and skills that could be included in narrative assessment ● Compile data over time to include in the narrative assessment ● Develop a personalized and time-efficient plan to write narrative assessments

Methods/Approach: This workshop is designed to address the Liaison Committee on Medical Education (LCME) Standard Element 9.5 (1) that mandates that "a narrative description of a medical student's performance, including his or her non-cognitive achievement, is included as a component of the assessment in each required course and clerkship of the medical education program whenever teacher-student interaction permits this form of assessment". An increasing number of medical schools have moved away from large lecture based educational activities to a greater number of small group, case, problem and team based activities. Each of these interactive educational sessions allows for more direct interaction between students and faculty, and therefore the LCME requires that the faculty members write narrative comments as part of the overall student assessment. While faculty development sessions are often focused on how to teach and run these sessions, this training does not typically include the development of skills needed to write personalized and meaningful narrative comments on the student's final assessment. In addition to deficient skills to write comments, faculty often voice a concern about the time needed to fulfill this extra demand on top of the time devoted to teaching (2). In this workshop faculty will learn strategies to design time-efficient and effective methods to write meaningful narrative comments that will not only establish compliance for accreditation, but more importantly, provide important feedback and guidance to students about their performance. A combination of brief presentations, individual and small group exercises, and large group interactive discussions will be utilized during the session. A specially designed worksheet, as well as handouts with example narratives, will serve as learning aides for the workshop.

Session Outline (90 minutes):

- Introductions and elicitation of questions, concerns, and barriers concerning writing narrative comments (10 Minutes)
- Workshop Faculty Panel Presentation: Educational benefits of writing narratives, strategies to address both non-cognitive issues and barriers, and the application of narrative writing skills to differing levels of learners (15 minutes)
- Individual Activity: Workshop participants will choose one educational program for which they are required to write narrative comments. On a specially designed worksheet, they will list the skills, behaviors and attitudes that can be assessed for their learners (10 minutes)
- Workshop Faculty Presentation: Characteristics of effective narrative comments with examples (10 minutes)
- Individual Activity: Participants will choose two of the attributes listed on their worksheet and write a sample narrative sentence for a learner that "meets expectations", and a sentence for a learner who is "marginal". (10 minutes)
- Small Group Breakout: Under the guidance of workshop faculty, participants will share and provide feedback on narratives written by participants (10 minutes)
- Workshop Faculty Presentation: Time saving tips for writing narratives (5 minutes)
- Individual Activity: Creation of a personalized and time efficient plan on worksheet (10 minutes)

● Interactive Discussion: Lessons learned and strategies for moving forward (10 minutes)

References: 1. Liaison Committee on medical Education: Functions an Structure of a Medical school: Standards for Accreditation of Medical Education Programs Leading to the MD Degree, April 2015 2. Power, BM and Chandler, K: Well-Chosen Words: Narrative Assessments and Report Card Comments, Stenhouse Publishers, 1998

Workshop 15: Beyond Information Transfer: Interactive Techniques to Engage Your Learners

B. Clyne, R. Tubbs, J. Smith, S. Michael, S. Rougas
Warren Alpert Medical School of Brown University

Learning Objectives: At the conclusion of this workshop, participants will be able to: 1. Explain how teaching techniques can influence learner comprehension 2.Describe at least ten examples of active learning 3. Identify common obstacles to using active learning techniques and strategies to overcome them 4. Adopt and apply one new interactive technique to their next large group presentation

Methods/Approach: It is commonly reported that learners retain only 10%-30% of what they hear in standard lectures. Despite this, lectures remain the prevailing form of teaching in medical education, relying on passive transfer of information to learners1. This poses a challenge since the average learner has a significant drop in attention after approximately 15 minutes without an active "reset". Research shows that instructional approaches that include active engagement result in positive learner attitudes, deeper understanding, and higher achievement2. This workshop will serve as a practical, hands-on guide for educators interested in employing interactive techniques to engage learners and move beyond simple information transfer.

Session Outline (90 minutes): At the beginning of the workshop, participants will identify an upcoming presentation that might benefit from the use of active learning strategies.

The introduction **(10 min)** will include an overview of the literature and supporting theory that supports active learning.3, 4 During the introduction, participants will be also exposed to several active learning techniques including storytelling, the pause procedure, poll-everywhere, commitment exercises, and think-pair-share1.

Following the brief introduction, participants will then break into groups (8 per group) to complete a "jigsaw" activity **(30 min).** During this exercise, participants will be assigned one of four different active learning techniques (board rotation, pick-the-winner, layered cake, thinking hats) 4 and start by becoming an "expert" in this technique. Each individual will then find the other person in their group who has the same technique and form an "expert group". This expert group will then report their technique to the rest of the group of 8, thus demonstrating now only each the jigsaw technique, but also reviewing each of the other 4 techniques as well.

Following the jigsaw exercise, participants will learn how to use concept maps as a tool to actively engage learners in a large group5 **(15 min).** Examples of concept mapping software and their use as an educational teaching tool will be demonstrated.

In the next segment, participants will divide into small groups to discuss the common barriers to implementing active learning techniques **(20 min).** Small groups will be tasked with discussing a different barrier and identifying 1-2 solutions to report out to the large group.

The workshop will conclude with a call to action: participants will be asked to commit to using at least 1 new active learning technique covered in the workshop during their next presentation **(10 min).**

References: 1. Wolff M, Wagner MJ, Poznanski SP, Schiller J, Santen S. Not another boring lecture: engaging learners with active learning techniques. The Journal of Emergency Medicine

2015;48(1):85–93. 2. Bonwell CC, Eison JA. Active learning: creating excitement in the classroom. 1991 ASHE-ERIC Higher Education Reports. ERIC Clearinghouse on Higher Education, The George Washington University, One Dupont Circle, Suite 630, Washington, DC 20036-1183, 1991. 3. Hake, RR. Interactive-engagement versus traditional methods: a six-thousand-student survey of mechanics test data for introductory physics courses. American journal of Physics 1998;66(1):64-74. 4. Wilson K, Korn JH. Attention during lectures: beyond ten minutes. Teaching of Psychology 2007;34(2):85-89. 5. Torre DM, Durning S, Daley BJ. Twelve tips for teaching with concept maps in medical education. Medical Teacher 2013; 35: 201–208.

Workshop 16: Harvest the Low Hanging Fruit First: Preparing Med Ed Innovations for Publication

R. Blanchard
Baystate Medical Center

Learning Objectives: At the end of this workshop, participants will be able to: 1. Identify the facilitators and barriers to innovation in the medical education culture both at their own institutions and throughout institutions at NEGEA 2. Develop their innovation(s) in preparation for publication 3. Discuss colleagues' innovations and discuss best practices for preparing innovations for publication

Methods/Approach: Medical education is ripe with innovation, in response to environmental trends,(1) and in response to local challenges. Accreditation mandates, simulation technology, student and resident scholarship, and curriculum design all present fertile ground from which to develop educational innovations. For several reasons, many educators find difficulty disseminating these innovations.(2) For example, they may fail to see their work as innovative, or struggle to identify an appropriate outlet for their work. Many times, educators lack skills to write about their innovations for publication or develop their innovations in a scholarly manner. Kanter (3) outlined considerations for educators preparing their innovations for publication. However, Kanter's editorial does not consider the myriad publication formats available to educators. Blanchard et al (2) continued this conversation for educators, and both editorials provide the backbone for this interactive workshop. This session leads educators through a process of reflection on their own innovations using Kanter's criteria. Participants will discuss theirs and others' innovations. Finally, participants will begin the process of preparing their innovations for publication, and leave with a strategy to continue their effort at their home institutions and guide others to the same goal. This workshop offers practical advice for participants on publishing their educational innovations, which they will apply to their own educational innovations during the workshop. Participants will also be encouraged to share this framework with colleagues at their home institutions.

Session Outline (90 minutes):

- Welcome and Introductions (10 min)
- Didactic (25 min) Defining and Cultivating Med Ed Innovation and Strategies for Publishing Innovations- a PowerPoint-guided, interactive presentation with stories which communicates the value of publishing educational innovations, and lists strategies for overcoming common challenges
- Participant Activities:
  - Part 1(10 min) Using a worksheet developed by the workshop facilitator and a colleague, and based on Kanter (3) and Blanchard et al (2), each participant silently outlines their own innovation. Where necessary, participants identify perceived or existent challenges.
  - Part 2 (15 min) In pairs, participants describe their innovations in the same format as a publication, and solicit feedback from their partner. They also

discuss potential solutions for perceived barriers for progress and/or publication.

Part 3 (20 min) As a full group, the process of developing an innovation for publication is discussed (including barriers and potential solutions). Specific challenges are identified and discussed as a full group. This debriefing session should help participants identify next steps.

Wrap-up/Conclusion (10 min)

Materials: Worksheet developed by the facilitator and a colleague to encourage scholarly review of an innovation for publication. (Attached)

References: 1. Irby & Wilkerson. Educational innovations in Academic Medicine and Environmental Trends. JGIM. 2003;18:370-376. 2. Blanchard RD, Nagler A, Artino AR. Harvest the low hanging fruit: Strategies for submitting educational innovations for publication. J Grad Med Educ. 2015, Sept: 315. 3. Kanter SL. Towards better descriptions of innovations. Academic Medicine, 2008;83(8).

Workshop 17: Using Data Visualization to Engage Faculty and Improve Curricula

C.M. Vaughan Boston University School of Medicine
B. Reid Dartmouth Medical School
T. Cameron AAMC S. Albright Tufts University School of Medicine

Learning Objectives: By the end of this workshop, participants will be able to: 1. Discuss the value of visualization in presenting data 2. Describe how visualization of curriculum data can improve faculty engagement in documentation 3. Provide examples of how data visualization can support curriculum improvement 4. Explain how knowledge and experience with data visualization can improve curriculum documentation

Methods/Approach: Medical schools are investing significant resources to document curriculum content. To maximize the return on this investment, curriculum leaders must find the best way to organize data and processes and engage faculty to ensure the highest possible quality of the data. It is also important to reward faculty engagement by taking the data back to faculty in formats that make the best use of faculty time and shows the best options for curriculum improvement. Visualization is one of the current innovations in reporting curriculum data in a manner that quickly shows coverage areas and helps faculty focus on areas for curriculum improvement. There are two strong arguments for the power of data visualization: 1) vision is by far our dominant sense, and humans have evolved to perform many data sensing and processing tasks visually; and 2) visualization enhances pattern matching, showing data in patterns and pattern violations: trends, gaps, and outliers. Visualization pares information to its simplest form, stripping away noise to increase the efficiency with which a decision maker can understand it. Large datasets are best understood through visualization. However, not all visualizations are actually that helpful. Bar graphs, or line graphs made with software defaults and couched in a slideshow presentation or lengthy document can be at best confusing, and at worst misleading, but visualization done well can cause a revelation. The best data visualizations expose something new about the underlying patterns and relationships contained within the data. Understanding those relationships — and being able to observe them — is key to good decision making. This session will use small groups to document and share innovative and best practices curriculum leaders have developed for documenting curricula, engaging faculty, and reporting data. Three schools using visualization to display curriculum content will share their experiences with visualization, particularly how the tool has enhanced faculty engagement and curriculum improvement. Small groups will share experiences with the use of

charts and other visualizations to share data and how these innovations can improve faculty engagement and curriculum improvement.

Session Outline (90 minutes):

1. Introduction of Panel Discussion Issues by speakers (30 minutes)
2. Focus group discussions for each of the following questions (30 minutes) What are the best practices for using data visualization? How can data visualization improve faculty engagement? What data visualizations best lend themselves to curriculum improvement?
3. Reports back to the whole group (25 minutes)
4. Questions/Wrap-up/summary (5 minutes)

Workshop 18: The Vermont Strength Assessment: Collaborative Integration of Competency Based Multiple Mini Interviews (MMI)

L. Greene, R. Barlow, J. Gallant, A.K. Howe
University of Vermont College of Medicine

Learning Objectives: After participating in this session, participants will be better able to: ● Describe possible best practices for implementing a MMI ● Identify strategies to engage student, resident, faculty, and community members into the interview process ● Assess the value of integrating AAMC core personal competencies into the interview process ● Identify strategies for interviewer development training and assessment ● Discuss measurable outcomes for evaluation of MMI process

Background: The medical school admissions process has a responsibility to the applicant, the medical school, and society to provide a fair, unbiased and equitable process, while also ensuring increased reliability and validity. The use of the personal interview in the admissions process can introduce bias into this process1. The MMI was developed at McMaster University by Eva and colleagues to broadly sample an individual's competencies in order to gain an accurate picture of that individual's strengths and weadnesses"1. The same authors have also shown that the MMI is predictive of clinical performance2. At the University of Vermont College of Medicine (UVM COM), we are in year two of designing and implementing our MMI. The purpose of this interactive session is to provide useful information for medical school admissions considering a change to the MMI as well as to generate ideas to improve current MMI practices. We will begin by briefly sharing our experiences and initiatives upon implementing the MMI format. Next, we will invite participants to contribute their effective practices and experiences and voice questions about MMI implementation. Participants will then engage in several activities designed to simulate MMI planning and implementation. Through discussion of what we consider to be our best practices in terms of interviewer team composition, interviewer training, and integration of the American Association of Medical Colleges (AAMC) Core Personal Competencies (CPC) for entering medical students3, we will generate a list of strategies for each aspect of MMI implementation. This list will be compiled and shared with participants following the meeting.

Session Outline (90 minutes):

(10) Welcome, Introduction, and Overview of Session

(10) Diversity of MMI interviewers

(5) Activity #1 Table Activity (small group discussion-Current and ideal interviewer composition at their respective institution)

(10) Debrief in large group (sample of table reports)

(10) Integration of Core Personal Competencies into MMI

(5) Activity #2 Table Activity (Blueprinting a MMI circuit question to reflect a core personal competency)

(10) Debrief in large group (sample of table reports)
(10) Training of MMI interviewers
(5) Activity #3 Table Activity (Active listening and a mock MMI interview)
(10) Debrief in large group
(5) Discussion of Next Steps; Summary and Conclusion

MMI INTERVIEWER TEAM COMPOSITION: Faculty plays a critical role in our interview process. We seek faculty from diverse specialties as well as academic rank. We also utilize students and residents in the interview process. Recently, we have expanded our network of interviewers to include community leaders who are committed to maintaining excellence in health care delivery within our state. These diverse interviewers allow applicants to be assessed from diverse vantage points.

QUALITY OF MMI INTERVIEWER TRAINING: Initially, we engage our interviewers in a formal 3.5 hour training session, including not only information on the mechanics of the interview itself but also in scoring and in becoming active listeners. Each interviewer participates in a mock interview as both the interviewer and the applicant. On interview day a member of the MMI Development Team meets with the interviewers pre-circuit to explain the scenarios and to ensure understanding of the core personal competency being assessed. Interviewers debrief post circuit to give feedback on how the scenario performed. The interviewers also complete a post-interview survey for continual quality improvement. **ASSESSMENT OF CPC:** We feel that integration of the AAMC CPC into the MMI circuit helps to ensure that our entering medical school class has the competencies necessary to succeed as future physicians. We have a MMI development committee which constructs the circuit blueprint so that all nine competencies are assessed. Specifically, each MMI scenario is matched to a core personal competency with the committee ensuring that the follow-up questions available to the interviewer help to assess the matched competency. UVM COM Admissions is committed to a competency and evidence based, data-driven, admissions process to guide our decisions which we hope in turn creates a fair and equitable process for all applicants. We will continue to analyze our data as we aspire to establish best practices. It is our hope that through this interactive session we will be able to share and build upon our successes as well as generate new ideas to help with our challenge of selecting the strongest, best qualified applicants to become our future medical doctors.

References: - 1) Eva K, Rosenfeld J, Reiter H, and Norman G. An admissions OSCE: the multiple mini-interview. Medical Education 2004; 38: 314-326. - 2) Eva K, Reiter H, Trinh K, Wasi P, Rosenfeld J, and Norman G. Predictive validity of the multiple mini-interview for selecting medical trainees. Medical Education 2009; 43:767-775. - 3) Koenig T, Parrish S, Terregino C, Williams J, Dunleavy D, and Volsch J. Core Personal Competencies Important to Entering Students' Success in Medical School: What are They and How Could They Be Assessed Early in the Admissions Process? Acad Med 2013; 88: 603-613. - 4) Knorr M and Hissbach J. Multiple mini-interviews: same concept, different approaches. Medical Education 2014; 48:1157-1175. - 5) Terregino C, McConnell M, and Reiter H. The Effect of Differential Weighting of Academics, Experiences, and Competencies Measured by the Multiple Mini Interview (MMI) on Race and Ethnicity of Cohorts Accepted to One Medical School. Acad Med. 2015: 90: E pub ahead of print.

Workshop 19: Examining Assessment Practices from EvidenceBased Learning Principles

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H. Rashid, Rutgers Robert Wood Johnson Medical School
W. Pluta, Georgetown University School of Medicine
J. Meka, Pennsylvania State University College of Medicine

Learning Objectives: At the conclusion of this workshop participants will be able to: 1. Evaluate the extent to which current assessment practices (at the participant's own institution) are aligned with evidence-based principles of learning. 2. On the basis of the learning principles, identify best practices at peer schools, as well as in the broader educational literature. 3. Apply core principles of learning to future curricular decisions about assessment.

Background: The goal of the proposed session is to give participants a venue to review and discuss how school-wide assessment practices and policies can be better aligned to core, evidence-based principles of learning to promote long-term retention and application of content, as well as performance on high-stakes examinations. The focus of this interactive session will be on Phase 1/Preclinical curriculum. Evidence-based practices are frequently underutilized in medical education1,2. There are a number of learning principles that can be used to inform school-wide assessment policies, instructional practice, and curricular design. In most schools, grading policies, remediation policies, school-wide examination feedback practices, and examination schedules can be better aligned with core learning principles, such as the: (a) organization effect, (b) explanation effect, and (c) deep question effect3 to improve student performance outcomes. For example, a large and growing body of research indicates that a powerful way to promote student learning and retention is through relatively frequent testing events. In fact, this work indicates that frequent testing (even without feedback) is more powerful than a number of commonly-used study techniques, including rereading or concept mapping4. This and related findings have important implications for school-wide examination schedules and other assessment-related decisions, leading to important questions related to the appropriate balance between implementing cumulative progress examinations5, implementing weekly quizzes, or supporting students as they develop self-study/assessment behaviors.

Session Outline (90 minutes):

1. Session Overview and Introductions: Presenters from three institutions with educational psychology backgrounds will explain the goals and objectives of the session. The presenters will review the format of the workshop and organize participants into small groups (5 minutes).

2. Review of Evidence-Based Learning Principle Research: Introduce participants to research in educational psychology about how to support student learning (15 minutes).

3. Small Group Work: Reflecting on their current practices, participants will work in groups to generate responses to four questions: a. How should the schedule of preclinical exams be structured to promote long-term retention and application of information? b. What form should exam feedback/review take? c. What are the best remediation/ exam retake strategies and policies to facilitate student learning? d. What self-assessment resources should be provided to help students prepare for exams/support long-term learning? Within groups, the participants will (a) share what is currently done in their own schools, and (b) what they might do to align practice and policy with the learning principles. Groups will report out to the larger group after discussion, including what changes they might suggest making at their school based on evidence-based learning principles (~15 minutes per question).

4. Large Group Debrief: At the conclusion of small group work, the presenters will facilitate a discussion on overarching issues related to aligning assessment practice with evidence-based learning principles (10 minutes).

References: 1. Steinert Y. Implementation Science in Medical Education: Is Best Evidence" Leading to "Best Practice"? AAMC 2015 Medical Education Meeting Plenary, Baltimore, MD. 2. Van der Vleuten CPM, Dolmans DHJM, Scherpbier AJJA. The need for evidence in education. Med Teach, 2000, 22(3): 246-250. 3. Karpicke JD, and Blunt, JR. Retrieval practice produces more learning than elaborative studying with concept mapping. Science. 2011, 331: 772-775. 4. Cutting MF, Saks NS. Twelve tips for utilizing principles of learning to support medical education. Med Teach. 2012; 34(1):20-4 5. Wrigley, W, Van der Vleuten CPM, Freeman A, Muijtjens A. A systemic framework for the progress test: Strengths, constraints and issues: AMEE guide no. 71. Med Teach. 2012; 34(9), 683-697.

Workshop 20: Aligning Incentives: An Appraisal of Resources Required for Preservation and Innovation of the Education Mission

L. Coplit, Frank H Netter MD School of Medicine at Quinnipiac
E. Friedman,CUNY Sophie Davis Medical School
R. Simons, George Washington University School of Medicine and Health Science
L. Snell, McGill University

Learning Objectives: 1. Identify key characteristics in curricular innovation and associated resources necessary to support the innovations. 2. Identify challenges to funding the educational missions of Academic Health Centers. 3. Formulate ideas on how to rectify resource allocations to address the demand for curriculum innovation, while recognizing the funding challenges of Academic Health Centers.

Methods/Approach: This workshop is an initiative of the Undergraduate Medicine Education (UME) section of the Group on Educational Affairs (GEA). UME programs are faced with the ubiquitous challenge of repeated calls for innovation in medical education.1-2 Unfortunately these calls do not adequately address the associated resource demands.3-4 As we strive for integration and individualization, we face increased staffing demands and find ourselves developing new organizational structures to centralize educational support. More and more, there is a need to financially support our faculty members actively engaged in curricular design, delivery and assessment.5 The Group on Educational Affairs UME section would like to explore evolving models implemented to support UME programming, in the hopes of articulating trends and identifying best practices. By acknowledging that overall resources are limited, we think this workshop will be a valuable addition to the conversation about educational innovation and core curriculum support. The information obtained from workshops at each of the GEA regional meetings will be combined with an extensive literature review, institutional surveys/interviews, and input from the Group on Business Affairs and other relevant AAMC partners, to create a national report of institutional models that could support educational goals in settings with a range of available resources. This workshop will contribute to our national discussion on this important topic and also introduce participants to alternative models utilized at regional institutions.

Session Outline (90 minutes): We propose an inquiry among our constituency to outline strategies employed at various institutions. Various models, such as educational value units versus FTE support versus set remuneration for educational roles will be explored. We will determine the pros and cons of each approach and articulate what has been effective in a variety of settings (academic centers, community-based programs, etc.). Additionally, we will identify the benefits and challenges associated with organizational structures that include centralized administrative support and have established offices of medical education

1. Overview of resources needed to support innovations, as well as the core curriculum. This section will include a focused presentation from three medical schools (20 minutes) a.

Sophie Davis School of Biomedical Education b. The George Washington University School of Medicine and Health Sciences c. McGill University, Faculty of Medicine

2. Participants will divide into small groups to focus on particular types of resources, such as faculty time, centralized staff support, faculty development, program evaluation, and so forth. Fictional cases will be developed for each type of resource and participants will use the cases to formulate ideas schools can use to rectify resource allocations. (45 minutes)

3. Participants will report out to the large group their discussion and ideas. (25 minutes)

References: 1. American Medical Association. Accelerating change in medical education: Creating the medical school of the future. Published 2015. Accessed November 25, 2015. 2. Kanter SL. Advancing the education mission. Academic Medicine. 2012;87:991-992. 3. Holmboe ES, Batalden P. Achieving the desired transformation: Thoughts on next steps for outcomes-based medical education. Academic Medicine. 2015:90:1215-1223. 4. Richards AJ. Advancing the medical education mission: The bottom line. Academic Medicine. 2013:88:434. 5. Clyburn EB, Wood C, Moran W, et al. Valuing the education mission: Implementing an educational value units system. Am J Med. 2011;124:567–572.

Workshop 21: Core Competencies, Milestones and EPAs – How Do They Relate to OSCE Rating Forms?

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L. Altshuler, New York University School of Medicine

Learning Objectives: By the end of the workshop participants should be able to: -Discuss different OSCE rating form designs (e.g., checklists, scales) -Determine whether Competencies, Milestones and EPAs should be included in Station rating forms based on the OSCE goals -Propose specific wordings that can help avoid typical rater errors

Methods/Approach: Objective Structured Clinical Exams (OSCEs) are quickly becoming a common element of the continuum of medical education. They have long been established in Undergraduate Medical Education since the licensing exam includes an OSCE-type assessment for quite a few years now. In Graduate Medical Education they are fast emerging since new accreditation requirements emphasize skills training and assessment. The Next Accreditation System and other guidelines propose massive changes, and it is being debated whether adjustments need to be made as far down as individual OSCE rating forms. Even in Continuing Medical Education (CME) educators have incorporated multiple station exercises to address specific competencies. For example, Objective Structured Teaching Exams/Exercises (OSTEs) are rising in popularity as the increase in conference presentations and publications on the topic testify. Although the majority of CME OSCEs are formative, some are also used for program evaluation or for screening candidates for training positions. In the mid 1970's Harden et al. developed OSCEs which provide a sampling of multiple cases and competencies. Over the years a variety of rating forms have been developed and there is much information in the literature about what qualities are necessary to establish confidence in the results (Kahn, 2013; Zabar, 2013, Harden, 2016). Clearly, the rating of learner's competence is a complex task that needs succinct instructions and consensus regarding a) what should be observed, b) how should behaviors be categorized, and c) how should they be recorded. Without doubt, raters need training and become prepared for the types of errors that can occur at every step. Unfortunately, whether they are faculty or SPs, time and resource limits often prevent optimal rater preparations. The new structures for medical education include new concepts and terms which raise new questions about how much and where they can or need to be integrated: Core Competencies (What types of knowledge, skills & attitudes should be tested?), Milestones (How developed are the competencies at this time? Where do they range on a novice to expert

scale?) and Entrustable Professional Activities (EPAs) (Is the learner ready to practice with or without supervision?) (ACGME, 2015; Ten Cate, 2013). Many questions arise as to new formats and content necessary to make such adjustments. Should each item be changed or should one provide some global ratings to reflect the new thinking about Milestones and EPAs. Should there be one rating form for all training levels or should one offer a limited set of rating options (e.g., Novice to Competent for beginning residents), assuming that the higher levels are reserved for more advanced trainees. Since there has not been any definitive guideline it is important to contemplate the various options. This workshop will attempt to discuss the pros and cons of different strategies and explore the impact changed rating forms will have on learners, faculty and the program as a whole. A brief introductory presentation will define and illustrate the different terms and strengthen participants' understanding of new accreditation requirements. A list of rating form options will be provided and the pros and cons of each will be discussed (e.g., feedback value, link with psychometric properties). In small groups participants will develop a decision tree to help guide future OSCE development and evaluation, and make the OSCE results useful for all types of decisions related to learners, faculty and programs.

Session Outline (90 minutes):

10 min Welcome & introductions

15 min What can we learn from an OSCE Station! (video, Think/Pair/Share)

15 min Definitions and presentation of issues involved (e.g., Core Competencies, Milestones, EPAs, OSCE and station types, rating form options, previously used strategies, adaptations for other assessment methods)

25 min How can they fit together and assist program decision making? (small group development of decision trees guided by worksheets, identifications of pros and cons such as implications for formative and summative assessments)

15 min Presentations to large group, discussion of findings

10 min Take-home points and closure

References: -Accreditation Council for Graduate Medical Education (ACGME). Frequently Asked Questions: Milestones. http://www.acgme.org/acgmeweb/Portals/0/MilestonesFAQ.pdf, accessed on 12/1/2015 -Harden RM, Lilley P, Patricio M (eds). The Definitive Guide to the OSCE. The Objective Structured Clinical Examination as a Performance Assessment. Edinburgh: Elsevier, 2016 -Khan KZ, Gaunt K, Ramachandran S, Pushkar P. The Objective Structured Clinical Examination (OSCE): AMEE Guide No. 81. Part II: Organisation & Administration. Med Teach 35:e1447-e1463, 2013 -ten Cate O. Nuts and Bolts of Entrustable Professional Activities. J Grad Med Educ 5(1): 157-8, 2013 -Zabar S, Kachur E, Kalet A, Hanley K (eds). Objective Structured Clinical Examinations: 10 Steps to Planning and Implementing OSCEs and Other Standardized Patient Exercises. New York: Springer, 2013

SHORT COMMUNICATIONS

Short Communication 1: Inspiring Innovation in Medical Education

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Purpose/Problem Statement: Although medical school focuses on teaching students the fundamentals of medicine and preparing them to perform in the clinic, the medical curriculum rarely offers students opportunities to demonstrate their ability to think creatively (1). Given the diverse background of medical students, who range from engineers to fashion designers, educators have the unique opportunity to capitalize on a wide range of talents and perspectives to advance medical technology. As medical students at UVM ourselves, we face the challenge of integrating our school and clinical work with our desire to innovate. To address this problem, we have designed a program at UVM that stimulates students from a variety of backgrounds to work together in developing new technologies and utilizing our school's resources to patent them.
Methods/Approach: Our first step addressing this problem was to create a live online document that we have used to record technological inefficiencies on the wards as we rotated through our clerkships. We then used these issues as topics for discussion, focusing on how we could effectively and creatively address them. Through this system, we eventually came up with the project of engineering a shoe for patients with fine motor disabilities. After learning more about the innovation and product patenting process, we established the very first student-run interest group at UVM medical school that focuses on creating and innovating medical technology to help carry out our project.
Results/Lessons learned: We learned that students at UVM have an interest in participating in team-based design of new medical technology and that there is a definite need for organizations that can serve as creative outlets. By thinking out loud about medical issues in a multidisciplinary team, we also learned a significant amount about the hidden difficulties and needs of the patients we serve. Furthermore, we discovered that our school has many resources in place to help our endeavors of which we were previously unaware. In addition to students, medical schools may also benefit from the technological advances conceptualized and carried out by these student-run teams. Now more than ever, medical schools must improve their ability to engage and foster collaboration across a diverse population of students, a problem that is addressed by our team-based approach to medical innovation (2).
Discussions and conclusions/Significance: Advances in medicine can be made by integrating innovative thinking and problem solving in the medical curriculum. Exposing students to the process of innovation earlier on in their careers will allow them to better dissect medical issues and think about how they could create technology that will facilitate the lives of both patients and physicians. We believe medical students, with their fresh perspective and seemingly inexorable determinism, are in a prime position to conceptualize and execute innovative solutions to many problems (3).
References: 1. Lippell, S., Creativity and medical education. Med Educ, 2002. 36(6): p. 519-21. 2. Yazdi, Y. and S. Acharya, A new model for graduate education and innovation in medical technology. Ann Biomed Eng, 2013. 41(9): p. 1822-33. 3. L. Sanders. Collective Creativity. AIGA journal of interaction Design Education. 2001. Number 3.

Short Communication 2: Development of an Instrument to Assess Performance and Learning in Interprofessional Health Care Teams

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George Washington University School of Medicine and Health Sciences

Purpose/Problem Statement: The purpose of this study was to develop and evaluate a comprehensive assessment instrument to evaluate learning and performance in interprofessional health care teams based on factors identified by national and international experts.
Methods/Approach: Teamwork is an integral part of health care delivery. The Affordable Care Act supports greater interdependence of patient care teams to promote coordinated high quality care. This emphasis on teamwork has generated the need to systematically measure and improve the learning and performance of health care teams. Yet, traditional evaluation methods fall short of effectively assessing learning and performance in interprofessional health care teams in a comprehensive and integrated manner. Although a number of educational models assess: interprofessional team performance; individual member readiness for interprofessional learning; professional perceptions; development of attitudes towards toward health care teams; and physician team functioning, there is no integrated instrument for assessing how well members of inteprofessional health care teams learn and perform together in clinical settings, as guided by individual, team, and organizational level factors
Results/Lessons learned: This study occurred in three four-month phases: (1) a panel of 25 national and international experts participated in the Delphi process to identify factors influencing learning and performance in interprofessional health care teams; (2) the research team analyzed the findings from two Delphi rounds to develop an instrument to assess team learning and performance and (3) a voluntary cohort of 27 students at The George Washington University [medicine (n=7); nursing (n=8); physician assistant (n=4); and physical therapy (n=8)] engaged in a clinical simulation to test and refine the instrument. Internal validity was assessed using Cronbach's alpha and exploratory factor analysis was used to examine the consistency of factors within the dimensions of team performance and team learning. Trustworthiness of qualitative data was insured through the use of: (1) triangulation through multiple researchers; (2) purposive sampling for diverse perspectives; (3) peer reviews; and (4) member checks. Direct participant quotes were used to enhance external validity
Discussions and conclusions/Significance: This study identified factors that enhanced interprofessional team learning and performance at the level of the individual, team, organization and task. Factors that enhance interprofessional team learning: An interprofessional team will learn more effectively, if: 1) individual team members communicate effectively, demonstrate knowledge of team function, listen actively and are respectful, open to learning, and committed; 2) the team is able to communicate effectively, develop a climate of mutual respect and trust and 3) the organization promotes a culture of safety (not blame), provides opportunities to work and grow in teams, promotes learning, and 4) the task incorporates active engagement and practice, mechanisms for communication, and instruction on team process. Factors that enhance interprofessional team performance: An interprofessional team will perform more effectively, if 1) individual team members communicate effectively, appreciate professional identity of self and others, invite contributions from others, and are respectful, willing to share knowledge, and ethical; 2) the team is able to develop a climate of mutual respect and trust, and adopt effective communication strategies; and 3) the organization uses a patient-centered approach, promotes a culture of safety (not blame), and promotes individual and team learning.Reflection: The Delphi Technique and simulations were

used to develop and evaluate individual, team, organizational, and task level attributes that enhanced learning and performance of interprofessional health care teams. The aim of was to develop an instrument to assess interprofessional education (IPE) activities; however having completed this study, the researchers recognized the importance of aligning education and practice activities. What emerged was the Interprofessional Education and Practice Inventory (IPEPI), which can be used to assess team learning and performance in both the educational and clinical environments.
CLINICAL RELEVANCE: Findings from this study can inform policy aimed at aligning competencies between interprofessional education and practice to better manage complex patient care.
References: 1. Ekmekci, O., Plack, M., Pintz, C., Bocchino, J., LeLacheur, S., & Halvaksz, J. (2013). Integrating executive coaching and simulation to promote interprofessional education of health care students. Journal of Allied Health, 42(1), 17-24. 2. Hepp, S., Suter, E., Jackson, K., Deutschlander, S.,… & Birmingham, L. (2014). Using an interprofessional competency framework to examine collaborative practice. Journal of Interprofessional Care, Sep 10, 1-7. 3. Koo, D., Miner, K., Tilson, H., & Halverson, P. (2014). Workforce standards as part of health department accreditation—Necessary but not yet sufficient. Journal of Public Health Management and Practice, 20(1), 125-127. 4. Neville, C., Petro, R., Mitchell, G., & Brady, S. (2013). Team decision making: Design, implementation and evaluation of an interprofessional education activity for undergraduate health science students. Journal of Interprofessional Care, 27(6), 523-525. 5. Zhang, C., Miller, C., Volkman, K., Meza, J., & Jones, K. (2014). Evaluation of the team performance observation tool with targeted behavioral markers in simulation-based interprofessional education. Journal of Interprofessional Care, Nov 25, 1-7.

Short Communication 3: Dialog about Psychosocial Topics in Problem-Based Learning Sessions

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Purpose/Problem Statement: Learning objectives relating to psychosocial aspects of health care are increasingly important in medical education, but research has shown that in PBL sessions learners are more likely to identify learning objectives related to scientific and clinical knowledge rather than psychosocial issues (Abdul Ghaffar Al-Shaibani et al., 2003).This project investigates how psychosocial learning issues are addressed during learning interactions in PBL groups. Learning interactions that occur during discussions of scientific and clinical learning issues in PBL groups have been analyzed qualitatively to describe how students engage in argumentation, questioning, and hypothesizing (Hmelo-Silver & Barrows, 2008), but no such studies have been found characterizing the quality of the learning interactions related to psychosocial topics. The purpose of this study is to open the black box" of the PBL session to directly observe how medical students discuss psychosocial issues and to elicit students' own explanations of factors supporting discussion of psychosocial learning objectives.
Methods/Approach: The study received IRB approval and was performed in fulfillment of doctoral dissertation requirements. Facilitator's guides for PBL cases were analyzed for the presence of learning objectives relating to psychosocial factors as defined by the Institute of Medicine (Cuff et al., 2004). The author observed and audio-recorded a consenting group as each case with psychosocial content was discussed. Those portions of the recordings containing dialog about psychosocial issues were transcribed and data analyzed to identify the dialog "moves" made by learners and facilitators to express or resolve uncertainties about psychosocial issues. Dialog moves made when discussing psychosocial issues were characterized using a taxonomy of questions, explanatory statements, and regulatory

statements (Hmelo-Silver and Barrows, 2008). Learners and facilitators who participated in the PBL sessions were interviewed to explore their perceptions about psychosocial learning issues as discussed in PBL. Cultural historical activity theory was used as a theoretical framework for analysis of transcribed interview data to uncover the unwritten rules of communication in PBL and in the medical education community concerning psychosocial learning objectives; and the impact that tools such as the PBL case itself have on the discussion of these issues.
Results/Lessons learned: Data collection began in October 2015 at one medical school observing PBL sessions occurring during Years 1 and 2 of the curriculum. Early results show that psychosocial learning objectives are rarely addressed as "official" student-generated learning objectives unless explicitly part of the case as indicated by intentional written clues in the case. Learning interactions involving psychosocial aspects of the case are of shorter duration than those involving scientific or clinical aspects of the case. Students who initiated discussions about psychosocial aspects of the case were often those with previous clinical experience. Another important factor described by student interviewees was time pressure: if group discussion time is limited, students preferred to focus on scientific and clinical concepts.
Discussions and conclusions/Significance: The research shows the primacy of the PBL case itself and the importance of intentional clues within it for generating discussion of psychosocial aspects of care during PBL sessions. Supporting and encouraging students to discuss psychosocial learning objectives in the PBL curriculum could lead to consideration of how to provide more holistic patient care.
Reflection: We can learn about the conditions supporting rich discussion of psychosocial issues during PBL sessions by directly observing group activity and probing students and facilitators about successful learning interactions involving psychosocial learning objectives.
References: Abdul Ghaffar Al-Shaibani, T. A., Sachs-Robertson, A., Al Shazali, H. O., Sequeira, R. P., Hamdy, H., & Al-Roomi, K. (2003). Student generated learning objectives: extent of congruence with faculty set objectives and factors influencing their generation. Education and Health (Abingdon), 16(2), 189-197. Cuff, P. A., Vanselow, N. A., & Institute of Medicine Committee on Behavioral and Social Sciences in Medical School Curricula. (2004). Improving medical education: Enhancing the behavioral and social science content of medical school curricula. Washington, D.C.: National Academy Press. Hmelo-Silver, C. E., & Barrows, H. S. (2008). Facilitating collaborative knowledge building. Cognition and Instruction, 26(1), 48-94.

Short Communication 4: Academic Coaching, Portfolios, and Holistic Assessment: Ingredients for Student Success

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Purpose/Problem Statement: The current pre-clerkship curriculum at the UCONN School of Medicine (SOM) consists of longitudinal year-long courses. In the basic medical science courses, students take high-stakes examinations after discreet sections. Students with difficulties are often not identified until mid-year, and the resulting remediation occurs during the summer months. Curricular reform is an opportunity to address this issue.
Methods/Approach: UConn SOM is undergoing curricular reform with implementation planned for the 2016-17 year. In addition to the refresh of the curriculum and shift to Team-Based Learning, the SOM has reconfigured the academic year to allow for shorter terms, in-depth assessment and enhanced academic coaching. The SOM is embracing a holistic approach to assessment, providing an opportunity to individualize learning. Robust academic advising, achieved by matching faculty as coaches with student advisees, will allow the SOM to not only address learning difficulties early on, but also provide enhanced learning opportunities linked to

assessment. During Stage 1 (first 18 months), there will be five ten-week terms and subsequent intersessions called “LEAP,” or Learning Enhancement and Assessment Periods, each being two weeks in length. These interludes will provide an innovative approach to incorporating assessment with learning. A holistic examination coupled with formative data in portfolios will allow academic coaches to work with students to identify learning gaps. The coach and student then create a learning plan for the balance of the LEAP period to either address a gap in learning or enhance student interest. The resources required include dedicated faculty, with appropriate faculty development and training; an IT infrastructure with a platform to tag question data, grade assessments quickly and sort tagged data into content and/or competency categories with a portfolio template that allows students to gather and share important data with their coach; teamwork amongst course directors for the creation of the appropriate examination and effective communication.

Results/Lessons learned: Lessons learned thus far relate to faculty and resources. The faculty voice in decision making is critical not only for buy-in, but also for a thorough review of what will be attainable in a particular institution. Committee function and overall governance contribute to successful reform. Providing a number of venues for faculty input is an important strategy in the planning process. Also critical for a successful transition to using portfolios and coaching is the realization that faculty will need to invest in the process, be given a concrete framework of expectations, provided faculty development, and ample protected time both leading into the innovation and during implementation for support and development. The administration must demonstrate a commitment to the change process by providing this support and opportunities for faculty development. Upon implementation, further lessons will be apparent and focused on student learning outcomes.

Discussions and conclusions/Significance: A review of the literature supports the notion of rigorous academic advising through a coaching and portfolio methodology. The design of the LEAP intersession combines holistic assessment, academic coaching, learning enhancement, and effective use of a portfolio system in an effort to reduce summer remediation and provide effective measurements of learning outcomes. Additionally, by emphasizing the enhancement of learning and individualizing a learning plan for all, we hope to reduce/ eliminate the stigma associated with remediation and focus on lifelong learning.

Reflection: Curricular reform provides an opportunity to be innovative in not only content delivery, but overall infrastructure to promote student learning and growth. Individualized education is possible through an effective coaching system, and may contribute to life-long learning.

References: Hall P, Byszewski A, Sutherland S, Stodel EJ. Developing a Sustainable Electronic Portfolio (ePortfolio) Program that Fosters Reflective Practice and Incorporates CanMEDS Competencies into the Undergraduate Medical Curriculum. Academic Medicine 2012; 87 (6): 744-751. Macaulay W, Mellman LA, Quest Do, Nichols GL, Haddad J, Puchner PJ. The Advisory Dean Program: A Personalized Approach to Academic and Career Advising for Medical Students. Academic Medicine 2007; 83 (7): 718-722. Tartwijk JV, Driessen EW. Portfolios for assessment and learning: AMEE Guide no. 45. Medical Teacher 2009; 31:790-801.

Short Communication 5: Impact of a Curricular Intervention on Resident Knowledge, Attitudes, and Prescribing Practices Regarding Intranasal Naloxone for Opioid Overdose Reversal

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Purpose/Problem Statement: In the midst of a growing opioid epidemic, concern has been raised that medical trainees do not receive adequate training in substance use disorders.1

There is mounting evidence that providing overdose education and naloxone kits to at-risk patients, relatives, and first responders reduces overdose deaths.2 However, naloxone rescue kits are still not routinely prescribed. A review of endocarditis admissions at Beth Israel Deaconess Medical Center (BIDMC), a large academic tertiary care center in Boston, MA, demonstrated that 0/102 patients with endocarditis as a result of intravenous drug use were discharged with a prescription for naloxone.3 In addition, very few had an addiction plan explicitly outlined in their discharge summary. The BIDMC Internal Medicine Residency Program has developed an addiction medicine curriculum for its trainees. The purpose of this study is to evaluate whether a brief, targeted curricular intervention improves resident knowledge and comfort level regarding naloxone rescue and increases self-reported prescribing of naloxone rescue kits.

Methods/Approach: In November and December, 2015, BIDMC internal medicine residents will receive a series of two one-hour didactic sessions that outline the scope of the opioid epidemic and strategies for harm reduction, including how to identify patients at risk for opioid overdose and how to prescribe intranasal naloxone overdose rescue kits. An electronic survey assessing residents' knowledge about naloxone use for opioid overdose reversal as well as attitudes regarding the management of opiate addiction will be administered before and two months after the new curriculum.

Results/Lessons Learned: Forty internal medicine residents (25%) completed the pre-intervention survey, including 15 interns, 13 second-year residents, and 12 third-year residents. Twenty percent of respondents (n=8) had received prior training in the use of naloxone rescue kits to reverse opioid reversal. One resident (2.5%) had prescribed naloxone in the past. Just 12.8% of the sample (n=5) agreed that they were adequately trained to prescribe naloxone rescue kits, whereas 79.5% (n=31) disagreed. One half of the sample (n=20) disagreed with the statement, "Treating patients with opiate addiction is professionally rewarding." The duration of naloxone action, approximately one hour, was correctly identified by 77.5% of respondents (n=31). Eighty-five percent of the sample (n=32) correctly identified that physicians in Massachusetts can prescribe intranasal naloxone to patients with opioid addiction, patients without opioid addiction who take narcotics for pain, and third parties. This varied by level of training, and senior residents were significantly more likely to answer correctly than first and second-year residents (91.2% vs. 33.3%, p=0.02). Curricular sessions are ongoing. The study post-test will be distributed in early 2016.

Discussions and Conclusions/Significance: Internal medicine trainees are often the front-line providers for patients with opioid use disorder; however, addiction medicine has historically been underrepresented in residency curricula. Prescribing intranasal naloxone for reversal of opioid overdose is a relatively new intervention that reduces mortality. Our study confirms that few of our internal medicine trainees have received formal training in how to prescribe intranasal naloxone and just 12.5% feel comfortable prescribing it currently. Half of residents do not find the treatment of addiction professionally rewarding. We are hopeful that our targeted curricular sessions will improve resident knowledge, attitudes, and prescribing practices regarding intranasal naloxone for opioid overdose reversal and we will be measuring this effect by post-intervention survey to be distributed in early 2016.

References: 1. O'Connor PG, Nyquist JG, McLellan AT. Integrating addiction medicine into graduate medical education in primary care: the time has come. Annals of Internal Medicine. 2011;154(1):56-59. 2. Walley, et al. Opioid overdose rates and implementation of overdose education and nasal naloxone distribution in Massachusetts: interrupted time series analysis. BMJ 2013;346:f174 doi: 10.1136/bmj.f174 3. Rosenthal E, Karchmer A, Theisen-Toupal J, Araujo-Castillo RV, Rowley C (2015, October). Addictions interventions in patients admitted with injection drug use complicated by infective endocarditis. Poster presented at ID Week 2015, San Diego, CA.

Short Communication 6: Integrating Acupuncture Curriculum in Addiction Psychiatry Fellowship Program

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Purpose/Problem Statement: Auricular Acupuncture has been studied as an adjunct to traditional treatment for substance use disorders. Many hospitals, outpatient clinics, and facilities are integrating acupuncture treatment. This includes the United States Department of Veterans Affairs which has integrated acupuncture services in many of their hospitals. Given the various leadership roles that psychiatrist hold within hospital, and VA settings it is imperative that they have a working knowledge of such interventions. The following study describes the National Acupuncture Detoxification Association (NADA) protocol and its inclusion as part of the curriculum for Yale psychiatry addictions fellows (Serafini, Bryant, Ikomi, & LaPaglia, 2015).
Methods/Approach: An acupuncture training curriculum was developed in 2009 for use in the addiction psychiatry fellowship program at Yale School of Medicine, Department of Psychiatry. The curriculum included the National Acupuncture Detoxification Association (NADA) 5-point protocol and the following topics: the acudetox-based treatment model; the nature of addiction and recovery; models for understanding addictions and behavioral health; pharmacology of psychoactive substances; public health and regulatory concerns; ethical and legal issues; client management issues and strategies; special populations. The training utilized the following teaching methods: lecture; video learning; experiential point description, location, and feedback; technique mastery through trial treatments; role play with clinical scenarios focused on boundary issues and clinical approach. The training was followed by administration of a satisfaction survey given to all participants over the past five years. Psychiatry and psychology fellows completed the acupuncture training (n=20) and reported on their satisfaction with the training.
Results: There were 20 individuals that participated in the survey. Overall, their responses strongly supported the inclusion of this innovative adjunctive addictions intervention within the training program. The majority found the training beneficial and reported a history of integrating acupuncture in their professional practice following graduation. In addition, 50 % of the respondents were currently implementing acupuncture services. There were 20 fellows that participated in the survey. The majority of respondents (70 %) had completed the acupuncture training within the previous 2 years. All participants completed the training within the years 2009 through 2013. The fellows reported overwhelmingly that they enjoyed the training and that they found it beneficial.
Lessons: 1. Provide the training early in the year. We incorporated the acupuncture training into the core curriculum of the Yale psychiatry fellowship at the outset of the training year, with the belief that the training would build cohesion among the cohort and that it would provide an opportunity for advanced skill development and comfort with the intervention. 2. NADA-certified trainers provided the NADA training over the course of 3 half days so as not to interfere with the fellows orientation to their training sites. 3. It is important that trainers experienced in both addiction and mental health provide the training. 4. Include real patients in one or more of the training days to provide trainees with supportive real world experience
Discussions and conclusions/Significance: It is imperative to expose future psychiatry leaders to this important adjunct intervention for the treatment of substance use disorders which we believe holds the possibility of increasing patient treatment engagement. In addition, as noted from the results psychiatrist trained in the intervention were more likely to “seed” new programs with acupuncture which helps to spread an effective adjunct intervention. We believe this type of training could be generalizable and beneficial to other types of fellowship programs such as Addiction Medicine, Primary Care, and Integrative Medicine.Reflection: Those working

in addictions treatment understand that often times the ability to engage patients in treatment is critical to saving lives. Through creation of this training curriculum we are able to arm physicians with a low cost, non-invasive, non-verbal, high patient satisfaction intervention--that keeps patients back to treatment. A true win" in the addictions field.
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Short Communication 7: The Stony Brook Teaching Families: A Novel and Practical Way to Integrate Family Centered Care and Contextual Learning

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Problem Statement: Many learners report going to medical school to help people, which is why they are eager for clinical engagement and patient contact (Bell et al., 2009). In the first two years of medical school, however, the primary focus is on building a solid foundation in the biomedical sciences rather than clinical exposure. While this is important and necessary, there is also value to 'putting a face' to the clinical conditions the learners are studying. This is ideally accomplished by exposing them to the family and cultural context that occurs in real clinical encounters early on, as it helps learners integrate and contextualize skills and knowledge (Dornan, 2004). Recognizing this, several medical schools in the US and abroad have done so or are starting to do so, although their methods have differed.
Approach: At Stony Brook, we have enhanced our current curriculum through the addition of the 'Stony Brook Teaching Families (SBTFs)', five simulated families representing diverse cultural and socioeconomic backgrounds. These simulated families, portrayed by actors and non-actors, were developed by interdisciplinary faculty in the School of Medicine (SOM) to create clinical and psychosocial context to the material in the preclinical curriculum. Each of the SBTFs has at least 2 family members who suffer from common clinical conditions, including diabetes, cancer, and dementia. These conditions affect the personal dynamics among family members and are presented in the clinical and cultural context in which real illness present. The SBTF "visits" occur throughout the preclinical phase using a variety of methods, including videos, improvisational monologues, PowerPoint presentations, group discussions, team based learning (TBL) and electronic medical record teaching sessions. The illnesses are presented in an unfolding and progressive manner, much as real disease presents over time.
Lessons learned: Initially, it proved challenging to engage the interest of the preclinical course directors in the teaching families and their inclusion in the curriculum. This was, in part, because the SBTFs project coincided with an overall reform of the curriculum. Although change is never easy, we all worked together and gradually the course directors began to recognize that the families are an excellent teaching tool. The development and implementation of the SBTFs also provided clinical, basic and behavioral science faculty with a much-required but seldom-realized opportunity for meaningful interdisciplinary collaboration.
Significance: Learning about clinical conditions by viewing patients in the context of their families provides learners with unique insight into the importance of biopsychosocial factors affecting human diseases. This innovation enhances the learning of pathophysiology and AAMC/LCME hot topics by showing learners what longitudinal patient care in a diverse patient population would look like. This makes the content more realistic, and more likely, we believe, to result in retention of knowledge of clinical conditions. Thus, the SBTFs provide students with

the opportunity to learn about the importance of patient and family centered care (Carman et al., 2013).
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Short Communication 8: Dígame Bienvenidos: An Intensive Pre-Orientation Program as a Tool for Integration of Community Health and Social Medicine Themes in the PreClinical Curriculum

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Purpose/Problem Statement: Medical schools have been making headway in increasing teaching on social justice and the social determinants of health by connecting students with the communities in which they practice [1] [2]. However, integrating these experiences into the already strained pre-clinical curriculum is challenging [3]. Here we present a novel longitudinal program in cultural competence and community health for pre-clinical medical students.

Methods/Approach: Columbia University College of Physicians and Surgeons (P&S) is located in the vibrant Washington Heights community of Northern Manhattan, where there is a significant monolingual Spanish-speaking population. Students have voiced an immense desire to engage with the Washington Heights community. In a survey conducted by the authors, 72% of respondents in the class of 2018 (n=91) wanted more opportunities to learn more about the community. With the support of the Steve Miller Grant in Medical Education and the IFAP Global Health program, the authors designed and conducted "Dígame Bienvenidos," a four-day pre-orientation program for 16 incoming medical and dental students to learn about the history, culture and social determinants of health in Washington Heights. Students participated in: tours of the neighborhood led by community members and a local historian; visits to community organizations; lectures and discussions on social determinants of health, history, immigration and social justice; reflection through group conversation and personal blog posts; and trips to cultural events and local restaurants. To broaden the program beyond those who participated in the pre-orientation. All participants in Bienvenidos were designated as community guides for their Foundations in Clinical Medicine (FCM) course (our "doctoring" course) which runs throughout the pre-clinical curriculum and incorporates content on social issues in medicine. A day of the course was dedicated to Washington Heights, in which Bienvenidos participants brought their experience to the entire P&S class by leading walking tours and in-depth discussions following a lecture on health disparities in the community.
Results/Lessons learned: The pre-orientation program was evaluated using a pre- and post-program survey which showed students felt more confident in their knowledge and understanding of the program themes and demonstrated continued dedication to reducing health disparities, exploring social justice in medicine, and working closely with the Washington Heights community both before and after the program. All participants strongly agreed" that they would recommend Dígame Bienvenidos to incoming students. Anonymous open-response feedback was overall positive, with one participant stating: "I found Dígame Bienvenidos to be an outstanding introduction to my medical education and the Washington Heights community… It also gave me a group of colleagues who shared my interest in community health and have since become great friends." The principal critique of the program was that students felt

"overscheduled" and would have appreciated more time for group reflection. Further evaluation is warranted to determine the long-term impacts of the program, evaluate the effectiveness of the student-led tours for class-wide learning and explore how these experiences affect students' trajectories in medicine. Despite these limitations, preliminary impressions suggest the usefulness of a short, intensive program followed by curricular integration in fostering student interest in the local community, health disparities and social justice in medicine.
Discussions and conclusions/Significance: A pre-orientation program with a longitudinal component may be an effective means to incorporating community health and social medicine themes into medical school curricula by forming a cohort of engaged, well-informed students who can serve an important role in facilitating discussion among their peers.
Reflection: Creating and piloting Dígame Bienvenidos has been a fantastic experience. The pre-orientation model allows for students to expand on their interest in communtiy health before setting foot in a classroom, setting the tone for the next four years. Empowered by this experience, the student participants have become leaders and advocates for community health within their class, and several of them will assume the pre-orientation leadership for next year with new ideas and perspectives. With truly inspiring and engaged student participants, the program has been an overwhelming success. We are thrilled to share our experiences and learn from others doing similar work.
References: [1] Coria, A., et al., The Design of a Medical School Social Justice Curriculum. Academic Medicine, 2013. 88(10): p. 1442-1449. [2] Martinez, I.L., et al., Twelve tips for teaching social determinants of health in medicine. Medical teacher, 2014(0): p. 1-6. [3] Carter-Pokras, O., et al., Surmounting the unique challenges in health disparities education: a multi-institution qualitative study. Journal of general internal medicine, 2010. 25(2): p. 108-114.

Short Communication 9: Vermont Medical Students: The Value of Understanding the Characteristics of Your Students

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Purpose/Problem Statement: The objective of this research is to identify characteristics and goals of each entering class. This information will be used for comparative purposes in evaluation of a longitudinal curriculum utilizing multiple methods.
Methods/Approach: The Department of Family Medicine at the University of Vermont was awarded a 5 year predoctoral training grant with the goal of increasing the number of students choosing family medicine and primary care and providing care for underserved populations. The grant emphasizes the role of the family physician as a leader of a healthcare team within the medical home, a community advocate, and a partner in patients' care. This program is comprised of multiple enhancements within the existing curriculum as well as several new innovative components within all years of the undergraduate medical curriculum.
Results/Lessons learned: A 17 item questionnaire was designed capturing the following categorical nformation: view of team members, comfort in key concepts of patient centered care, communication skills, caring for diverse populations (including rural and underserved), career choices, and view of the physician role within communities. A pilot of the questionnaire was sent to the class of 2017. Information from this pilot was used to modify specific questions. Questions concerning care of the underserved were also added to the revised questionnaire. Utilizing RedCap, the questionnaire was sent to matriculating students (Classes of 2018, 2019) within the first two weeks of medical school. Follow-up reminders were sent approximately two weeks after the initial invitation. Data was collected within RedCap.
Discussions and conclusions/Significance: Students matriculating at the University of Vermont (Classes 2018 and 2019) believe that physicians should have a high degree of

community advocacy. Almost 40% intend to practice in a rural setting and/or practice in primary care. Over 70% intend to prioritize care to underserved populations. Matriculating students recognize multiple members of the healthcare team and over 20% recognize the patient as a member of that team.
Reflection: It is important to understand what your learners' characteristics and goals are at the onset of medical school in order to assess whether curricular innovations have an impact on student outcomes. Students matriculating at the University of Vermont College of Medicine enter with a higher degree of commitment to primary care and intent to serve disadvantaged populations than national averages. Future directions The data collected through this survey will be utilized as comparative data to the same class upon their graduation. This information will also be correlated with the number of students going into primary care and/or family medicine as well as the number of graduates providing care in medically underserved settings.
Limitations: Support of the curriculum will end two years before data can be analyzed. Unfortunately a pre curriculum data was not collected so we do not have baseline comparison data.
References: Matriculating Student Questionnaire, 2014, AAMC website: https://www.AAMC.org/download/419782/data/mcq2014report.pdf

Short Communication 10: Teaching Medical Students Forensic Evaluation of Asylum Seekers: Five Clinical Models

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Learning Objectives: Attendees will: Be introduced to the unique needs of this population of people seeking asylum in the United States. Explore clinical settings to teach students to perform medical forensic examinations. Acknowledge the often disturbing nature of asylum seeker's histories who allege torture and provide emotional support for trainees participating in these evaluations. Recognize the importance of emphasizing the specific role a physician plays in evaluating asylum seekers. In this role, phsyicians provide objective forensic expertise, and do not provide care.
Methods/Approach: By the end of 2014, 19.5 million refugees and 1.8 asylum seekers were displaced worldwide, due to ongoing conflict, violence and human rights abuses. Physicians are uniquely qualified to use their training to assist members of this vulnerable population. Regardless of specialty interest or stage of training, students often display significant interest in global human right issues and desire an introducation to providing expertise to this growing population. We will discuss the advantages of medical student involvement in the following settings: in a small exam room with one to two students, in a medical simulation center with up to eight students, in a discussion group, in a detention center, and in a classroom didactic setting. Students and residents who participate in these evaluations often hear about disturbing incidents. We will discuss the need to provide emotional support before and after the appointment. Finally, physicians perform these examinations as objective medical evaluators and do not provide care for asylum seekers. It is important to emphasize this role for students who are more familiar with a role of medical caregiver.
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psychological evaluations of torture and ill treatment. Cambridge, MA, Physicians for Human Rights.

Short Communication 11: "Your Patient Does Not Speak English": Lessons for Communication, Patient Advocacy and Teamwork in a Student-Initiated Medical Chinese Elective

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Purpose/Problem Statement: Problem statement: Although research demonstrates that individuals whose care is inhibited by communication barriers and/or lack of sensitivity to culture have poorer health outcomes, caring for patients of limited English proficiency (LEP) is given cursory attention in the standard medical school curricula.1 In addition, there is limited opportunity for medical and nursing students to engage in formative discourse on best medical practices. Objectives: 1. To provide level-appropriate language and cultural training to medical and nursing students. 2. To facilitate shared learning and clinical problem-solving between medical and nursing students.
Methods/Approach: The course, entitled 'Medical Mandarin,' was a one-semester long Optional Enrichment Elective, open to all UMass medical students and advanced practice nursing students. Two levels of medical Chinese were offered: 1) Beginner and 2) Intermediate to Advanced. The sessions were 1.5-3 hours per week for a total of 15 instructional hours. Students who attended 80% of the instructional sessions received course credit as noted on their transcripts; there was no penalty for students who did not complete the course, consistent with the policy for all Optional Enrichment Electives. Instruction for the course was provided primarily by fourth-year medical students from China, who were at the University of Massachusetts Medical School on a one-year research rotation as a part of the UMass-China Exchange Program. Teaching in the Medical Chinese elective course is now a requirement for all students participating in the exchange program. Additional instructional support was provided by UMass clinical faculty who are native Chinese speakers. The primary teaching materials—presentations and vocabulary sheets—were instructor-generated (a copy of the course syllabus and session objectives are attached). The Confucius Society of Massachusetts donated 30 copies of a medical Chinese-English translation handbook, which were provided to the students on loan for the semester
Results/Lessons learned: 1. There is an active interest to receive Chinese language and cultural training. In the first semester, 16 medical and nursing students were enrolled; one medical resident audited the course. In the second semester, 23 students have enrolled. 2. At the end of the inaugural semester, course evaluations demonstrated that 83% of the students who completed the course felt both 'more confident interviewing Chinese patients,' and 'more confident caring for Chinese patients.' 3. This elective is a feasible approach to further engage the visiting international medical students at the institution.
Reflection: Culturally appropriate care for LEP patients is an essential component of quality health care as demonstrated by the Joint Commission Standards.2 This is especially true for the Northeast region of the U.S., where more than half of the medical graduates in 2015 now work in cities—Boston, Cambridge, New York City, several cities in California—in which the Chinese speaking population is more than double the national average. Therefore, the Medical Chinese elective can equip students with the necessary tools to serve as competent and compassionate providers. The next step for the elective is to facilitate students' application of knowledge in the clinical setting. Given the broad interest from the clinical faculty who are native Chinese speakers and the collaboration with the UMass-China Exchange Program, current efforts are

directed towards providing students with guided practice in hands-on clinical care of LEP patients from China.
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Short Communication 12: Game Changer? Patient Views on the Impact of the Electronic Health Record on Patient and Family Centered Care

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Purpose/Problem Statement: The electronic health record (EHR) has dramatically influenced the delivery of healthcare leading to changes in communication, workflow and in our interactions with patients and families1. Patient centered care is widely recognized as a hallmark of excellence in care delivery and at the University of Rochester, we have a long history of using a patient centered lens and the biopsychosocial model in the education of our learners. Considering the influence of technology on clinical practice, a patient centered care focus needs to be prioritized in the development of EHR educational programming. The aim of this study was to identify patient centered needs in regards to the utilization of the EHR that will inform an educational framework for medical student education.
Methods/Approach: In the Fall of 2014, focus groups were conducted with seven patient and family advisory councils (72 total participants) throughout the University of Rochester Medical Center system. These focus groups were audio recorded and transcribed for analysis. Grounded theory framed the methodology for this study in our intent to generate theories related to individuals' interaction with EHR; aiding in current and future practices/frameworks for EHR use 2-3.
Results/Lessons learned: Analysis identified four strong themes: Interactions: Communication was a central theme. Patients and families describe it as a dialectical relationship that needs attention. EHR and technology should be about how it serves the patient and providers and not providers and patients serving the system. Ergonomics: In-office use of technology should be "shared" between providers and patients. Patients want to see and engage in their care. The equipment/computer is situated at the expense of this relationship often facing away from patients that is disengaging. Information: Patients are worried that the EHR is fueling a disconnection between them and the providers; they have privacy fear; and that the format allows for greater mistakes in information input. They want more information related to care delivery specifically who took care of them, support teams, what are providers decisions, changes to care plan. Access: The most dominant theme that emerged centered on access to the system, information, their care team and education. They requested areas in MyChart for patients to enter data, concerns and questions. While they are in our institutions they want to have greater access to EHR that would allow for communication without direct interactions. They want more of MyChart to increase communication and facilitate information exchange.
Discussions and conclusions/Significance: As educators, we need to consider the tremendous potential that the EHR provides for patient engagement, education and communication. For our patients, the EHR is not a barrier to care but facilitates more interaction, information and education largely facilitated through the patient portal. We need to design educational experiences that teach our current and future workforce how to maximize this opportunity.
Reflection: Becoming more than a technological tool; EHR has reshaped scope of practice for providers and accelerated delivery and access to care for our patients. We need to align our

educational programs with changes in clinical practice and adapt to the influences of technology.References: 1. Verghese A. Culture shock--patient as icon, icon as patient. N Engl J Med. 2008 Dec 25;359(26):2748-51. 2. Charmaz, K. (2006). Constructing grounded theory: A practical guide through qualitative analysis. Thousand Oaks, CA: Sage Publications. 3. Corbin, J., & Strauss, A. (2007). Basics of qualitative research: Techniques and procedures for developing grounded theory (3rd ed.) Thousand Oaks, CA: Sage.

Short Communication 13: Academic Core Curriculum to Enhance Junior Faculty Development

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Purpose/Problem Statement: Senior Instructors and Assistant Professors in their first academic appointment may not have all the basic skills and knowledge they need for the most effective start to their academic medical careers. To address this problem, we designed and implemented an innovative structured core curriculum for junior faculty that would enable these individuals to obtain some of the basic skills and knowledge that would enhance their careers and facilitate more rapid progress along their chosen trajectory.
Methods/Approach: Focus groups of junior and of senior Medical Center faculty identified specific needs for advancing a junior faculty career. Based on this input, we developed a structured week-long, core curriculum to deliver these necessary basic skills and knowledge. Topics included statistics overview, manuscript review, grant review, research funding, informatics, educational scholarship, career advancement, mentoring, wellness, and local resources. Course instructors were senior faculty and staff from across the medical center with expertise in the identified specific needs. Junior faculty participants were required to attend all sessions, including networking lunches.
Results/Lessons learned: There has been overwhelming interest and support for the curriculum with participants from nearly every department in the Medical Center. Department Chairs have been very supportive, facilitating “protected time” during this week.A total of 100 faculty have participated in this program over a 2 year period. Concurrent evaluations have been uniformly very positive. Six-month evaluations have confirmed the value of the curriculum with participants reporting applying the skills and knowledge attained. Participants reported: greater focus on development of their academic career plan, seeking additional mentorship, greater ease in networking, getting “credit” for their educational activities and a greater awareness of the range of resources available across the Medical Center.
Discussions and Conclusions/Significance: Medical Centers may have a tremendous range of resources available to new faculty; however, these resources may not be well recognized or coordinated. A concentrated, week-long Junior Faculty Core Curriculum provides basic skills and knowledge and fosters social and professional interactions among junior faculty and senior faculty who can help them succeed.Reflection: This program offers an alternative format for junior faculty development. This intensive 5-day course provides a strong foundation in academic medicine while promoting interactions among participants that do not ordinarily occur during intermittent faculty development offerings. We plan to continue offering this program annually to all junior faculty.
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Short Communication 14: Innovative Interprofessional Programming for Health Professions Training Program Directors

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Purpose/Problem Statement: Problem: Healthcare is increasingly delivered by interprofessional healthcare teams. Team members require training in providing profession-specific care (e.g., medicine) and in working as interprofessional teams. This latter training is needed to meet competencies in interprofessional practice, which include teamwork and team-based practice, interprofessional communication practices, values/ethics for interprofessional practice, and understanding roles and responsibilities for collaborative practice1. However, professional training models largely integrate learners from different professions only after they are fully trained2, a significant barrier for developing interprofessional healthcare teams. Strategies to increase early interprofessional training include ensuring senior leadership support, offering early team-based experiences, and training faculty to teach in interprofessional educational settings1,2. Barriers exist to implementing these strategies, requiring the health professions education community to identify innovative solutions that lead to interprofessional education and improved patient care.
Approach: Currently, many faculty members have little or no experience with interprofessional education2. Initial programming to meet this need was focused on health professions training program directors affiliated with VA Boston Healthcare System, one of the largest training academic health centers in the US. Training program directors were already meeting monthly to discuss administrative issues common to all programs. The agenda for these meetings was revised to allow for activities that would help meet the competencies for interprofessional work. Each meeting now begins with a different training program director describing the training needed for each profession and the structure of the training program at VA Boston. Educational innovations developed by each program and areas in which the program would like to grow, are discussed. Following this presentation, training program directors discuss the issues raised and potential collaborations among training programs, including ideas for joint programming. Finally, an evidence-based teaching strategy identified in the literature, that could be used in any training program, is discussed. This agenda allows training program directors to engage in activities aligned with interprofessional competencies including teamwork and team-based practice, communication practices, values/ethics, and understanding roles and responsibilities of other professionals. Plans for evaluating the effectiveness of these meetings are being developed. Specifically, training program directors could provide quantitative and qualitative data about their experiences at these meetings, identify changes in perceptions of interprofessional education, and describe learning activities that are developed as a result of these meetings.
Lessons learned: Prior to the new interprofessional format, committee meeting attendance was low, there was little awareness of other training programs, and minimal collaboration among programs. Attendance and participation increased as a result of revisions made to the meeting agenda. Members of the committee were exposed to information about a multitude of different training programs and training paradigms and had the opportunity to interact with each other to provide mutual support and to consider how trainees in different programs can interact. The teaching topic discussed in the meetings was well received and a number of training program directors reported discussing these strategies with faculty members in their training program.
Significance: Few programs exist that focus on enhancing interprofessional competency among health professions training program directors, despite the importance of these activities. The proposed innovations submission will allow for the dissemination of an innovative strategy to integrate activities consistent with interprofessional education into scheduled education

meetings. Other academic health centers may incorporate elements of this strategy into their education leadership programming to further promote interprofessional education and evidence based teaching at their medical center

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Short Communication 15: The One-Minute Learner: An Innovative Tool to Promote and Structure Student-Faculty Discussion of Goals and Expectations

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Learning Objectives: By the end of this session, participants will be able to: 1. Describe the importance of having an efficient and formalized method for both faculty and learners to discuss goals and expectations to enable effective clinical learning experiences 2. Describe and use the One-Minute Learner to facilitate a discussion of goals and expectations in the clinical learning environment 3. Have the skills and materials to implement the One-Minute Learner at their institution with both students and faculty

Background: A significant challenge to medical student education is the wide array of clinical settings and teachers where and with whom our students learn. Not all teachers remember to discuss goals and expectations with each learner with whom they work. Many may intend to, but do not always make the time. Further, and perhaps most importantly, many preceptors do not realize the critical importance of discussing goals and expectations to the success of a clinical learning experience and so therefore do not routinely do this. The concepts of goal setting, clearly defining expectations and encouraging face-to-face conversations are grounded in both adult learning theory and uncertainty reduction theory. Because they are adult learners, we want our students to set personal learning goals and be active and productive members of the clinical team; however, given the nature of the clinical setting and culture, we often do not ask what our learner's goals are and do not provide clear expectations. Additionally, as described by Berger and Calabrese, uncertainty reduction theory states that when individuals approach new interpersonal relationships (like a student and faculty), they want to decrease uncertainty, and further be able to predict their own and others' behaviors. That reduction in uncertainty is critical to setting up a clinical teaching encounter to succeed. Student and teacher expectations drive the activities and anticipated outcomes in any teaching/learning environment. Many medical educators have seen the outcomes of mismatched student-teacher expectations: students feel that they are not being told what they need to do and feel stress and anxiety, teachers feel students are not listening or anticipating, students complain that they are being evaluated unfairly, etc. Mismatches in what either party expects and what actually happens, sets up teaching encounters to fail. For example, if a preceptor expects a student to be at a certain level of clinical skill, but the student is in fact not at that level, the responsibilities and performance expectations for that student will be incorrect. This can lead to poorer quality teaching and learning, frustration, and problems with evaluation. Some of the benefits of a student understanding their role and expectations upfront is that it gives the student a sense of structure, clarifies their role, decreases their anxiety about not knowing what is expected of them, and helps them quickly integrate into the clinical environment and team; it also sets the groundwork for future feedback and assessment. Additionally, one method to foster a productive clinical learning environment for a student and help them feel they are a valued member of the team, is to put an emphasis on student goal setting. Goal setting when done alone or as part of a learning contract helps facilitate self-directed learning behavior, allows students to feel more

energized and in control of their learning, improves learner-educator relationship, increases the learner's motivation, and fosters deeper learning and life-long learning behaviors. Discussion of goals between student and faculty sets up a situation where the faculty is more likely to give students feedback on their progress towards meeting their goals. Further, it can help create a safe learning environment. It can also potentially improve academic achievement and clinical performance. Trying to navigate all of these things at once can be particularly difficult for students and can lead to cognitive overload, making clinical learning even more challenging. In order to alleviate these problems, we have developed the One-Minute Learner (OML). The OML is an easy-to-use and efficient tool that promotes and structures a conversation about goals and expectations during clinical teaching sessions. Either faculty or student can initiate the tool. It prompts faculty to voice their expectation for the student's performance including items such as which patients the student should see, how long they should spend with them, the amount of involvement in clinical care, and expectations for the student's presentation and note writing. It allows students to feel empowered to initiate a conversation regarding their prior learning experiences, current learning goals, and to ask more clarifying questions about specific expectations. It enables and structures a quick and simple conversation that allows students and teachers to be "on the same page," which leads to a satisfying and productive clinical teaching session. The One Minute Learner does not take long to discuss and does not need to be used at every clinical session; additionally, at times only certain components will be needed. The One Minute Learner is specialty-neutral and can be used in a any clinical setting and with any level of learner. To support the teaching of the One Minute Learner we have developed materials to be used when presenting it to students and to faculty. These include pocket cards (with inpatient and outpatient sample language), "one pagers" that provide more detail than the pocket cards, and role plays.

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Short Communication 16: Multifactorial and Individualized: Analyzing the Whole Career Decision-Making Process Influencing General Surgery Residents' Ultimate Career Choice

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Purpose/Problem Statement: This study attempts to identify factors that influence general surgical residents' ultimate career choice. These were then compared with factors that made them apply to medical school and subsequently choose general surgery. We chose to examine the whole career decision-making process while concentrating on medical education and identification of those factors which influence career choice to help avoid a shortfall in general surgical recruitment and retainment. This study intended to follow if the factors of deciding a career in medicine have any impact on their choice of specialty and ultimate general surgery career path. We aimed to determine the views of medical students and junior doctors regarding influences on their career aspirations, such that potential disincentives to a career in general surgery could be identified.

Methods/Approach: This is a retrospective, longitudinal study. A questionnaire was administered to residents from a university general surgery residency program. Demographic information and factors influencing career intent were elicited. The questionnaire influences on specialty preferences were indicated in order to assess the factors to which students attach importance when choosing their first specialty preferences as well as choosing general surgery as a career. Responses to the influences were categorized as minor or major influences. These influences included hours of practice, on-call schedule, flexibility of specialty, interaction with other physicians, the reputation of the specialty, the duration of the residency program, work pressure, career/job satisfaction, interest in research, interest in long term relations with patients, physician-patient interaction, diversity of patients, anticipated income/compensation, the intellectual content of specialty, the individual's competencies, mentor emulation, advice from faculty members, advice from friends, advice from parents, and advice from practicing physicians. Chi-square analysis was used to address questions involving relationships among variables.

Results/Lessons learned: There were 94 general surgery residents (50 males, 44 females) with an 80% response rate over the studied 6 year span. 20.2% (19/94) of the residents were married (12 males, 7 females.) The most common medical school factors that were present in general surgery residents were being influenced by a role model (88%), career /job satisfaction (85%), intellectual content and growth of the profession (82%) and altruism to serve the patient and society (80%). The extensive workload (38.4%), poor work-family balance (36.5%), training duration (34.1%), and compensation (30%), have been identified by those who chose a surgical career as factors that discourage graduates from choosing surgery as a specialty. Of note, as general surgery residents progress through their residency and craft their ultimate career path, their priorities have changed as evidence in that they have responded that the high-intensity/low compensation general surgery career has lead them away from General Surgery with only 13% remaining in General Surgery. Fields such as Minimally Invasive Surgery (63%), Surgical Oncology (41.2%), Breast Oncology (36.2%) and Colorectal Surgery (34.2%) are now the predominant career paths of graduating general surgery residents. Moreover, emphasis on favorable lifestyle/family issues (83.6%) has become a major factor in their decision away from a career in General Surgery. The attrition rate was 7.4% (7 out of 94). The main reason was lifestyle issues.

Discussions and conclusions/Significance: Many researchers have tried to determine factors that influence students' and residents' specialty preferences. Several studies have cited clinical role models as being important influences on students' residency preferences . This included negative role models, who drove students away from some specialties. Surgery may lend itself more readily to the influence of role models. A surgeon who serves as a role model may be a parent or other relative, neighbor, personal physician, family friend, or medical school faculty members. Regardless of the source, role models were a powerful influence on the career preference of 41.8%. Surgery is an attractive option for students. However, general surgery has taken a backseat to the surgical subspecialties such as plastic surgery, orthopedic surgery, otolaryngology, and neurosurgery. General surgery is competitive in its selection, yet the surgical subspecialties are more so. General surgery residents have an average USMLE Step 1 score of 230 and 15% are members of AOA, while surgical subspecialty residents have average scores of 245-260 and AOA membership rates of 30-40%. The surgical subspecialties are so much more competitive and yet desired by medical school graduates. This can be that compensation and lifestyle/work balance supersede the length of training and eventual lifestyle/work balance. Today's majority of medical school graduates may not be willing to accept the extensive workload and work-family imbalance as unchangeable components of a career in general surgery. These factors that were initially accepted by those entering a General Surgery residency have caused them to ultimately decide in a career not in General Surgery.

Reflection: While we know that growth of the general surgery workforce has not kept pace with U.S. population growth. We have graduated the same number of general surgeons annually since 1970, at just about 1,000 a year. So with population growth considerably in excess of estimates, the ratio of surgeons to population is less than [that] in 1970. In 2008, 32% of general surgeons are aged older than 55 years. This percentage will only continue to grow. The shortage of overall physicians is well documented, but more so dramatic in General Surgery. The shortage results from a multitude of factors, including sequential decreases in reimbursement, an unfavorable work environment arising out of professional liability and malpractice risks, increased subspecialization and the demanding lifestyle characteristics of general surgery. The extensive workload, training, and poor work-family balance have been identified as factors that discourage graduates from choosing General Surgery as a career. The identified positive factors could be used to attract and maintain graduates in surgical disciplines. An important conclusion of this study is that it is important for surgeons to not underestimate or belittle the most often and most consistent concerns for not pursuing and remaining in a career in General Surgery. Further research and proactive measures is clearly needed to identify which unidentified factors impact on General Surgery graduates' career preferences and which of these can be manipulated to influence career preferences in a particular direction.
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Short Communication 17: She Said, He Said - Resident Perceptions of Gender and Leadership in Acute Resuscitations: A Qualitative Analysis

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Purpose/Problem Statement: Effective communication and team dynamics are critical to successfully lead ED resuscitations. Literature suggests that gender can influence leadership style and how leaders are perceived. The purpose of our study was to explore EM residents′ perceptions of gender and its impact on acute resuscitation team dynamics.
Methods/Approach: This exploratory qualitative study was conducted from 4/1/15 to 6/15/15 at two level 1 trauma centers in New England, where EM residents lead medical/surgical resuscitations. After obtaining verbal consent, a trained qualitative interviewer conducted anonymous, in depth, semi-structured interviews until theme saturation was reached. Subjects were PGY 2-4 EM residents. Interviews were audiotaped, transcribed, de-identified, coded, and analyzed using MAXQDA v12. A resident physician, nurse, and non-clinical research assistant met as a group to code all segments and reach agreement in coding. Thematic content analysis consistent with grounded theory was used to identify themes related to residents′ perceptions of gender in the acute resuscitation room.
Results/Lessons learned: Sixteen EM residents participated: 6 female, 10 male, (6 PGY2, 6 PGY3, 4 PGY4). Female residents (100%) reported that gender impacted nursing relationships and team dynamics compared to 60% of males. The need to gain the trust of nurses to

effectively lead resuscitations was reported by 67% of female and 10% of male residents. Directive and commanding behavior in females was often perceived as overly assertive, while this was more likely to be accepted as a leadership quality in males. Several female residents noted being timid, soft spoken, or having a smaller stature directly affected a female′s effectiveness in leading resuscitations. Both genders (75%) reported females faced more challenges to earn respect as leaders, but this effect decreased with experience.
Discussions and conclusions/Significance: EM residents who lead resuscitations perceived gender as having a major effect on team dynamics. Several themes regarding barriers to effective leadership were perceived as disproportionally affecting females. Findings suggest gender related differences may impact team leadership dynamics and should be addressed in resident training.
Reflection: Leadership is a critical skill to acquire during emergency medicine residency training. A qualitative method was used to garner responses that would be difficult to measure quantitatively. We conducted an exploratory analysis of residents' perceptions of their role as team leaders in resuscitations. We hope that this will be the first step to understanding the effect of gender in leading acute resuscitations. Our results indicate that future education in resident leadership training could benefit from including a gender-based component to help overcome such gender-based stereotypes.
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Short Communication 18: Assessing the Effectiveness of Pediatric Sick Visits: Do Resident Determine the Caregiver's Main Concern and are Caregivers Satisfied?

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Purpose/Problem Statement: In Barbara Korsch's seminal research on gaps in doctor-patient communication 50 years ago,the major concern of parents was not determined by residents in 25% of sick visits, potentially creating unnecessary parental anxiety [1]. The study objectives were: 1) To assess if residents determined the caregiver's main concern, 2) To determine if residents determine why the caregiver is concerned, and 3) To assess caregivers' satisfaction with the visit.
Methods/Approach: Prior to being seen for a sick visit, caregivers reported their main concern. Research associates observed communication between the resident and caregivers to assess if the resident determined the caregiver's main concern, why they were concerned, and other factors related to resident communication skills during the interaction. Anonymous exit-interviews were conducted following sick visits that assessed the family's satisfaction. Potential correlates of assessing caregiver concern and caregiver-reported satisfaction were tested using the Chi-square test and Wilcoxon Rank Sum test.
Results/Lessons learned: One hundred three sick visits were observed over a 5 week study period. The frequency residents asked the caregiver's main concern was 84.47% (n=87) 95% CI(77.35%-91.58). Although not statistically significant, there was an increase in asking the main concern with 72% of first year residents and 88% for both second and third year residents (p=.14). Only 42.57% (n=43) 95% CI(32.76%-52.38%) of residents asked why the caregiver was concerned. 90.29% of caregivers reported being satisfied with the visit; 31.07% (n= 32) 95% CI(21.98-40.16) reported it was the one of the best visits they had while 59.22% (n=61 95% CI(49.57-68.88) reported the visit was very good.

Discussions and conclusions/Significance: Our results confirm that residents are asking caregivers what their main concern is at sick visits more often than reported in Korsch's work. However they are not as likely to delve into why the caregiver is concerned. This is a critical part of the interview to determine what underlies the parents' reason for the visit. As residents' experience increased, they were more likely to determine the caregiver's main concern. Finally, caregivers were overwhelmingly satisfied with the care their child received.
Reflection: Our study has quality improvement implications in our ambulatory department and indicates the need for more resident communication instruction.
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Short Communication 19: Looking Back to Move Forward: First-Year Medical Students' Meta-Reflections of their Narrative EPortfolio Writings

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Purpose/Problem Statement: Narrative medicine techniques are increasingly being used in medical schools nationally and internationally to increase reflective capacity of students throughout the medical school continuum.1 In 2013, the Columbia University College of Physicians & Surgeons (P&S) introduced a longitudinal e-portfolio beginning with first year students. The e-portfolio capitalized on the deep reservoir of faculty trained in narrative medicine techniques at P&S and allowed students to archive all their writings. The e-portfolio allowed for an important innovation--the addition of a meta-reflection that encouraged students to look back over their writings. These Signature Reflections (SR) that students complete every semester prompt students to notice what they have written about their development. This evaluation sought to understand how 1st year 1st semester medical students, who specifically reflected on their e-portfolio experience and writings, represent their development with regard to their reflective capacity.
Methods/Approach: SR that were analyzed included those that were clearly written in response to the prompt: Write about the doctor you imagine yourself becoming; what did you notice about yourself in your writing? Students were informed that all reflections would be de-identified and that they could opt out of inclusion in research. Twenty SR were read by faculty involved with implementation of the e-portfolio. Faculty were asked to surface common words and concepts from the SR. A smaller research team iteratively developed a codebook which included codes that addressed both the content and form of the student writing. Drawing from the reflective capacity and professional identity formation literature, the team constructed a conceptual framework to guide the analysis.2,3 Thematic analysis ensued with two primary coders coding the SR with guidance from experienced qualitative researchers. The research team discussed and selected salient and emergent themes of early coding, (with intercoder agreement rate of 80%) which are presented from this ongoing analysis.
Results/Lessons learned: Sixty percent of SR (97/160) qualified for analysis. Preliminary analysis of 40 SR using Dedoose surface the following cross-cutting themes: 1) patient perspective 2) maintaining their sense of self while becoming a competent physician 3) embracing patients' humanity 4) struggle with uncertainty as a marker of introspection. Change underscored all of these themes; as one student wrote, "Looking over my previous portfolio entries, I've noticed a trend where notions or ideas that I thought I was comfortable with are challenged by my experiences."
Discussions and conclusions/Significance: By training students in narrative medicine, mentored close reading and creative writing, we sought to increase reflective capacity. In

particular, we implemented a narrative meta-reflection, which encourages students to look back over a semester of writing for themes in their own development. Preliminary evaluation of this curricular innovation at the end of their first semester suggests that students notice movement in their attitude and professional identity. Elements of the developed conceptual framework (movement, self-discovery, development of reflective capacity) are seen in their writing. While not all 1st year students followed the prompt and could not be included in this analysis, further training and standardization of the experience for students will likely increase this number in the future. The day-to-day rigors of medical education often preclude learners from gaining a longitudinal perspective on who they are becoming, and the e-portfolio is a possible tool for engendering healthy professional skill-building and resiliency.
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Short Communication 20: How to Start a Medical Humanities Journal

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Purpose/Problem Statement: 1. Appreciate the value of medical humanities for empathy development, self-reflection, and self-care; 2. Discern the multi-step process to start a medical humanities journal; 3. Recognize and mitigate pitfalls commonly encountered when starting a medical humanities journal.
PROBLEM STATEMENT: Medical humanities are uniquely valued in medical school curricula as a means by which medical students garner and maintain empathy for patients, and develop self-reflection and self-care skills.1,2 Despite the cited value,3 it is unusual to showcase and honor medical student accomplishments in the expressive arts and humanities during their science-intensive education. It is also rare for clinical faculty to model the use of creative artistic expression for self-care. Publishing a school-based medical humanities journal can provide a forum for students and faculty to creatively explore and appreciate health, illness, and humanity. That said, it is a manifold process to bring a medical humanities journal to fruition. We intend to present our process and share early successes and setbacks so that others can build on our efforts.
APPROACH: Medical sciences (AW) and health sciences faculty members collaborated to create an on line medical humanities journal which debuted Spring 2014. With support from the school of medicine dean, we engaged university resources including public relations, legal services, and academic and information technology, to secure a professional, transparent, efficient, sustainable platform for the journal. Submissions were solicited from students and faculty in the schools of medicine, health sciences, and nursing. To date, there are two published volumes and a third volume in press.
LESSONS LEARNED: The lessons learned can be broadly categorized as: political, artistic, technical, and pragmatic. Specifically, we learned about using publishing software, soliciting contributions, creating copyright agreements, protecting patients who are represented in the submission, developing evaluation criteria for submissions, editing and layout, promoting the journal, applying for an ISSN through the Library of Congress, and how to negotiate and collaborate.

SIGNIFICANCE: There are no readily available guidelines for creating a medical humanities journal. The guidelines presented here will help others who wish to start a journal to recognize and capitalize on existing institutional resources and avoid pitfalls.
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Short Communication 21: Narrative Professionalism as a Teaching Strategy

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Purpose/Problem Statement: Narrative medicine is an approach to medicine that recognizes the value of people's narratives in clinical practice, research, and education. Students perceive that they develop and improve specific communication skills; enhance their capacity to collaborate, empathize, and be patient-centered; and develop personally and professionally through reflection. Narrative professionalism however is a special application of narrative medicine that provides a safe and confidential forum for students, residents, and faculty to learn specifically about the praxis and parameters of medical professionalism. However, there is a paucity of literature regarding use of narrative medicine groups as curricular methodology promoting intra and interdisciplinary communication and professionalism among physicians and students. The purpose of this study was to determine if the experience with Narrative Professionalism is beneficial to participants; helped with team cohesion and enhanced a participant's ability to deliver patient/family centered care.
Methods/Approach: For several years, narrative professionalism workshops have been conducted with Ob/Gyn residents, medical students, and chief resident across specialties. For the first 10 or 15 minutes of each Narrative Professionalism group session, participants are invited to write informally--in response to a professionalism-themed assignment--an account of an actual clinical experience that significantly shaped or tested their professionalism. For the remainder of the session, participants simply read their narratives, in turn, to this informed, peer-audience, taking advantage of this exchange to interpret collectively the meaning and extended implications for professionalism within each narrative. This kind of reflective-practice-in-action examines and clarifies the nature of both professional conduct and the constituent components of an exemplary professional identity. The narrative medicine-trained facilitator guides the discussion. Participants were then surveyed using a three question survey utilizing a 5 point Likert scale.
Results/Lessons learned: 200 participants participated in the sessions; students n=153; chief residents = 23; Ob/Gyn residents = 24. Students and residents thought the sessions were beneficial to their sense of professional well-being and resiliency (Q1 - 94.7%) and beneficial for professional team cohesion (Q2 - 94.1%). Additionally, they thought it would help them deliver Patient- and Family-Centered Care (Q3 - 82.8%). The students in general answered question#3 more optimistically than the Ob/Gyn residents and chief residents. However, there was no significant difference between students and residents in any of the survey questions—uniformly all three groups surveyed thought it was a positive experience.
Discussions and conclusions/Significance: Narrative medicine groups at SUNY Downstate have been highly successful in highlighting and teaching professionalism to medical students and residents. While there are logistical challenges including such sessions in the curriculum, the results have been worth the effort. One of the limitations of this project is that with exception

of the Ob/Gyn residents, the other participants only have this session once. However the survey responses from all three groups have been similar. The comments have been uniformly positive as well. One student stated “It was honest and heartfelt. It engendered a real sense of solidarity.”

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Short Communication 22: PEARLS: A Longitudinal, Integrated Approach to Leadership Training for First and Second Year Medical Students

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Purpose/Problem Statement: Healthcare in the United States is undergoing tremendous change and physicians need to be able to lead and participate as members of healthcare delivery teams. Current literurature suggests today’s residents are inadequately prepared to meet their daily clinical leadership responsibilities, thereby contributing to a “leadership gap” in medicine.1 Some undergraduate medical education (UME) curricula seek to address this gap as evidenced by a recent systematic review of leadership training that endorses, “employing a longitudinal and integrated approach to leadership training in the high stakes, time-limited UME environment.”2 PEARLS is the case/problem based learning centerpiece in a student-centered curriculum at Hofstra North Shore-LIJ School of Medicine and recipient of the 2015 NEGEA Innovation in Medical Education Award. Based on the nature of our PEARLS program, we hypothesized that we could measure the longitudinal development of leadership skills and traits in medical students during their participation in this program.

Methods/Approach: We instituted a longitudinal, mixed-methods study to assess the development of leadership skills and traits of first and second year students participating in PEARLS. On the first day of medical school and at subsequent intervals, students completed two self-assessment questionnaires previously shown to reliably measure leadership skills and traits, respectively: the Leadership Skills Questionnaire (LSQ) and the Leadership Traits Questionnaire (LTQ)3. Students in each PEARLS group completed an LTQ about themselves and their peers (up to eight peers). In addition, each PEARLS facilitator completed the survey so that self, peer, and faculty perceptions of student leadership could be evaluated. In addition, PEARLS facilitators participated in semi-structured interviews to identify aspects of the PEARLS program critical to fostering the development of student leadership skills and traits.

Results/Lessons learned: We assessed 18 leadership skills using the LSQ and 14 leadership traits using the LTQ. Results will be presented from the perspectives of student self-assessment (LSQ and LTQ) as well as both peer and facilitator assessments (LTQ). These results will focus on identifying leadership skills and traits that showed improvement or that students developed after a year and a half of participation in PEARLS. Results of semi-structured faculty interviews will highlight leadership skills and traits (from the LSQ and LTQ) observed by facilitators during student participation in PEARLS as well as specific elements of the PEARLS program that contributed to them. We predict that many leadership qualities will improve as students progress through the PEARLS program and that facilitators will be able to articulate specific components of the program that lead to this success. We will also provide data demonstrating that

integrating leadership development into our case/problem based curriculum did not negatively impact students' learning of the basic sciences as evidenced by USMLE Step 1 performance.
Discussions and conclusions/Significance: We will discuss implications of our results, limitations of our study, new questions raised, and areas for future study.
Reflection: Time is sparse in medical curricula and many schools utilize a problem or case-based component of their curriculum. Results from our study will serve to inform how best to integrate leadership training into existing programs in undergraduate medical education curricula.
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Short Communication 23: Multiple Independent Sampling (MIS) Methodology Reduces Rater Bias Thereby Enhancing Fairness in the Medical School Admissions Process

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Purpose/Problem Statement: It is in the interest of the applicant, the medical school, and society that the admissions process be fair and equitable. Like many other medical schools, the University of Vermont previously used a process that involved having individual Admissions Committee members review the entire application and then recommend an action to the Committee for vote. However, informed by the literature and our own experience, we came to understand that this process may inadvertently introduce an important cognitive rater bias, or "halo-effect". First described by Nisbett and Wilson, this occurs when one aspect of the file unconsciously influences assessment of other, unrelated aspects of the file by a single reviewer1. Hanson et al introduced the MIS methodology as a means to reduce cognitive bias created by the halo effect2. This methodology employs independent assessment of separate aspects of the applicant file by multiple reviewers. We assessed the effectiveness of this methodology in our application process.
Methods/Approach: Complete applicant files were divided into 4 domains (academic, experience, personal statement, reflections). Each domain was individually and independently scored by members of the Committee and then discussed at a Collective Holistic Review of the entire file. Data from the 2015 and 2016 application years were evaluated. The mean score for each domain was calculated for all applicants, accepted applicants, and non-accepted applicants. Chronbach alpha was performed between the 4 domain scores as a measure of reliability, and Intraclass Correlation Coefficient (ICC) was calculated for the 2016 application year to assess inter-rater reliability. A total of 562 applications from 2015 and 81 from 2016 were analyzed.
Results/Lessons learned: Domain scores were shown to correlate with acceptance, with the scores for the academic, experience and reflection domains significantly higher in the accepted than in the non-accepted applicants (p values = .000). Importantly, however, the Chronbach alpha for 2015 was 0.262 and for 2016 was 0.353, indicating that the score of one domain had little effect on the others, demonstrating that this new process had no halo effect. Meanwhile the ICC showed strong correlations for the academic (0.884), experience (0.962), personal statement (0.969) and reflection (0.965) domains, indicating remarkable scoring consistency among different raters.

Discussions and conclusions/Significance: These results suggest that applicants with stronger academic, experience and reflections domains were identified for admission with less rater bias, since little "halo-effect" was found. We conclude that the MIS promotes a fairer admissions process. We were further able to demonstrate that our raters have very good consistency in scoring the different domains.
Reflection: While initial feedback from committee members indicates increased satisfaction with decreased time requirements, we hope to more closely assess rater acceptability of this process. We hope to refine assessment of the domains by developing a more comprehensive training for domain rating. This process can be applied not only to the medical school admissions process but also to residency programs as well.
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Short Communication 24: Learning Style Preferences of Medical Students: Implications for Academic Support Programs

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Purpose/Problem Statement: New York Medical College has a mission driven initiative to increase diversity in its medical school graduates. Utilizing a holistic review process, all admitted students exhibited the requisite experiences, attributes, and pre-matriculation metrics for success in medical school. Currently, 20% of first year and 19% of second year medical students are underrepresented in medicine (URM) and 10% of the first year and 9% of the second year students received the AAMC Fee Waiver (FAP), a marker for lower socioeconomic status. There is evidence suggesting socioeconomically disadvantaged and certain URM students are not educationally prepared for the rigors of medical school curriculum. Educational literature supports the use of certain tools to help students assess their own learning style(s) which, when part of a reflective, metacognitive process, can help a student achieve academic success in a challenging learning environment. In this study, first and second year medical students completed the VARK survey, a tool to assess their preferred learning styles (visual, aural, read-write, or kinesthetic, or a combination). Identification of students' preferred learning styles enhances our tailored academic support programs. Future work will explore how students' learning style preference(s) correlate with academic performance.
Methods/Approach: The VARK survey was administered at the beginning of the 2014-2015 academic year. It consists of 16 questions, each with four possible answers. Each answer represents one of the four learning styles; students may select more than one and up to four answers for each question. There is a range of 16-64 possible answers per student in a given survey. Percentage calculations are based on the number of students identifying with each learning style preference. Data analysis included determining the preferred learning style(s) of each student, analyzing each class as a whole, and analyzing trends among URM, non-URM, FAP and non-FAP students.Results/Lessons learned: Results of the VARK survey for all participating members of the first year (n=190) and second year (n=188) classes showed an overall preference for kinesthetic learning: 61% of MS1 students and 62% of MSII students displayed a preference for kinesthetic learning. URM students (MSI n=38; MSII n=36) showed a significant preference for aural learning compared to non-URM students (MSI n=152; MSII n=152): 55% of MSI URM compared to 47% of non-URM MSI students, and 58% of MSII URM compared to 47% of MSII non-URM students displayed a preference for aural learning. FAP

students (MSI n=22; MSII n=15) showed a lower preference for read-write learning than non-FAP students (MSI n=168; MSII n=173): 27% of MSI FAP students compared to 52% of MSI non-FAP students, and 40% of MSII FAP students compared to 49% of MSII non-FAP students displayed a preference for read-write learning.
Discussions and conclusions/Significance: The VARK survey results have provided insight into the learning style preferences of our students, which serves as a catalyst for successful learning. Two published studies support the statistical validity of VARK. However VARK is a short survey and serves only as a starting point for further discussion, not a thorough educational evaluation. Our results imply a majority of students prefer to learn using the kinesthetic style. This finding supports the increased use of active learning techniques in medical education. URM students' preference for aural learning over their non-URM peers suggests this subgroup of students may thrive in group discussion and lecture settings. Data also demonstrate FAP students have a lower preference for read-write learning than their non-FAP peers. This gap was particularly pronounced in the MSI students, while smaller in the MSII FAP students. There may be some adaptation occurring as students move through the MSI curriculum.
Reflection: This study suggests that academic support and transition programs should be tailored to the diversity of students' learning styles. Future work will include statistical analysis and correlation of learning style preference with academic performance, and comparison of data across numerous demographic groups. Students will be surveyed at the beginning of every academic year over four years, and data will be analyzed.
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Short Communication 25: An Interdisciplinary Approach to Train Medical Students and Respiratory Therapy Students in Basic Principles of Mechanical Ventilation

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Purpose/Problem Statement: Learning to work as a member of a patient care team during the training years using an interdisciplinary model is a novel approach in the education of medical and other health care professionals. It is expected that physicians and respiratory therapists work as a cohesive unit when managing patients requiring mechanical ventilation however there is currently little opportunity during their respective training programs to train side by side, interact with each other and appreciate each other's role. Learning principles of ventilator management including arterial blood gas analysis and ventilator waveform interpretation, and learning to work as a member of a patient care team should ideally begin during the training years using an interdisciplinary model of training.
Methods/Approach: Through a pilot project funded by a Tufts University School of Medicine (TUSM) Innovations in Medical Education award, small groups of third year medical students and senior respiratory therapy students were instructed in arterial blood gas analysis, basic principles of mechanical ventilation and basic ventilator waveform analysis over a 4 week block. The methods used include lecture/discussion, assigned readings, small group case solving, and

patient bedside management of mechanical ventilation issues. Pre and post written questionnaire, open-ended question response, and exit focus group moderated by a member of the medical educaton department were used to gather information from the students including thoughts and feelings about the training experience and suggestions for improving the program.
Results/Lessons learned: In general, student ability to interpret arterial blood gases improved.The medical students felt inferior to the respiratory therapy students in knowledge about modes of mechanical ventilaton, felt they approached ABG analysis differently, and wanted more opportunity to interact one on one with respiratory therapy students to learn from them. Students in general did not do the readings because they were not being tested on them and concentrated on peparing for the end of clerkship exam. Suggestions for improving the program included using a simulation ventilator to review settings, modes and waveforms. Feelings of inadequacy, fear of slowing down the group, finding a common ground of knowledge, lack of time to master the material, limitng the material to fit the amount of time available, appreciating the time with student doctors, and appreciating exposure to the material before being the responsible MICU intern were some of the ideas expressed during the focus group.
Discussions and conclusions/Significance: We have been through 2 iterations of this program and expect to collect information from 1 or 2 more groups of students. One of the students wrote that interdisciplnary education is hard as the teacher and learners are trying to achieve a common ground but the problem is that the 2 groups of students enter the program at different levels of knowledge". This challenge is exciting as it has been our experience that as long as both groupos of students are permitted to interact, become more comfortable with each other and ask questions of each other, interdisciplinary problem-solving occurs fostering a mutual respect and understanding that potentially could be carried over to the professionsal practice environment.
Reflection: This pilot project needs to be expanded to more sessions with each group to allow more indepth presentation and discussion of each topic - arterial blood gas analysis, modes of mechanical ventilation and mechanical ventilator waveforms. The students preferred the clinical bedside sessions and wanted to see waveform abnormalities on actual patients. In addition, the concept of interdisciplinary training could be expanded to include nursing students and pharmacy students, simulating the professional environment of an actual MICU team.
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Short Communication 26: Passing the Torch: A Model of Student Engagement to Develop Leadership and Administration Skills in Future Medical Educators

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Purpose/Problem Statement: Across the nation innovative new curricula based on small group learning require intensive commitment of many more faculty than in traditional medical school programs. Concerns for the future have been raised by recent losses of clinical and basic science faculty due to educator burnout and diminishing resources. Institutions now more than ever need to invest in their medical students and junior faculty to develop them into skillful educators and curriculum administrators. The Integrated Pathways Curriculum (IPC) at the SUNY Downstate College of Medicine is a new innovative competency-based, integrated medical education program. It has triggered unprecedented student enthusiasm in curricular issues. Following the inaugural year of the IPC, students pressed for faculty to develop a Medical Educator Pathway (MEP) grounded in a philosophy of student leadership and curricular

engagement. Faculty advisors helped student leaders steer the evolution of this scholarly pathway for fellow students aspiring to enter careers in academic medicine. Students of the MEP are encouraged to participate in the development, implementation, teaching and evaluation of the IPC alongside faculty content experts and medical education advisors. As an example, near peer students are involved in clinical skills training of junior colleagues. Numerous authors have articulated the benefits of near peer teaching to the learners and the student educators.1,2,3 Our student-driven model however, also has the unique benefit of developing leadership, communication and administrative skills needed for successful careers in medical education.

Methods/Approach: During implementation of the MEP students enthusiastically demonstrated interest in near peer teaching opportunities. The need for a higher faculty to student ratio during physical exam skills training was identified as a curricular resource need. With guidance from MEP and Clinical Skills (CS) faculty advisors, a few MEP students took the initiative to organize a longitudinal near peer teaching corps of clerkship students to co-facilitate 18 physical exam sessions across the pre-clerkship curriculum. The MEP student coordinators recruited and scheduled this cadre of third and fourth year medical students, revisited the content and curricular materials taught in all clinical skills labs, attended planning meetings with CS directors, distributed teaching materials, invited students to faculty development sessions, scheduled debriefings with CS leadership and solicited feedback from near peer teachers. To ensure successful implementation of the CS near peer teaching program in future years, junior MEP students shadow the senior coordinators of the program. Supervision by CS and MEP faculty advisors remains ongoing. Effectiveness of the near peer teaching corps is evaluated by surveys of learners and OSCE scores. Development of leadership, communication and administrative skills of student coordinators is evaluated through self-assessment and self-reflective essays, and feedback in debriefing sessions from near peer teachers.

Results/Lessons learned: Student MEP leaders who took on significant responsibilities to implement this near peer clinical skills teaching model were all in the early months of their third year clerkships. The student leaders used simple technological tools to recruit and schedule students that faculty would have been unlikely to use but which worked exceedingly well. Competing clerkship responsibilities however required more faculty intervention than expected to keep students' administrative deadlines on track. Therefore, we recognize that multiple student coordinators are needed for successful implementation of the program. Fortunately, physical exam teaching sessions are concentrated according to the organ systems units and therefore not constant. Multiple student leaders would then allow coordination of their responsibilities according to their clerkship schedules. Although the student coordinators did not develop the content for the clinical skills sessions during this first year of the program, debriefing sessions provided opportunities for CS directors to get feedback from near peer student teachers on ways to improve the content and logistics of the CS sessions. Plans to formally survey the near peer teachers will be implemented in future years.

Discussions and conclusions/Significance: Benefits of near peer teaching programs to learners and student teachers have been extensively studied. Our student led program offers a practical curriculum-based model to develop administrative and leadership skills in medical students who aspire for careers in medical education.

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Short Communication 27: The "Ready 4 Residency" Course: Using a Flipped, Blended Learning Model to Build a Modern Classroom for Senior Medical Students

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Purpose/Problem Statement: The final year of medical school is a critical but often underutilized opportunity for learners to consolidate knowledge and prepare for residency1. Residency transition courses have been developed to accomplish these goals, but there is significant variability in structure and implementation2. Furthermore, despite calls to modernize medical education3, progress has been limited, particularly in residency preparation courses where students must learn to make knowledge actionable. We describe "Ready for Residency (R4R)," an innovative course piloted at our institution in Fall 2015. R4R employs a flipped, blended learning model and is specifically designed to facilitate the transition to residency, maximally engage learners, and capitalize on modern learning principles and technologies.
Methods/Approach: R4R is a one month required course for senior medical students, incorporating multiple learning modalities. The online component includes weekly virtual patient modules with embedded resources (e.g. videos) and activities, including "attending questions" (quizzes), "assignments" (e.g. order sets), and "rounds," (peer discussions with instructor feedback). The half-day classroom component, complemented by simulation exercises, focuses on case-based clinical management, teamwork, and application of knowledge. Lecture time is minimized with a predominance of small group and team-based learning, including use of the audience response system. Together, these activities and learning modalities promote active learning and peer teaching, encouraging students to refine their clinical decision-making skills both individually and in teams. The evaluation of the course included interim and final questionnaires, real-time feedback via student liaisons, and summative focus groups conducted by evaluation specialists.
Results/Lessons learned: Students regarded the flipped, blended model favorably. 96% of students reported that both the overall course quality and online component exceeded expectations. Students praised the interactive format and described high engagement compared to lecture-based curricula. As well, students highlighted the high-yield nature of the course content. Additional faculty development in active learning techniques will improve the course. This work demonstrates that a flipped, blended learning model can be an effective pedagogy for medical school instruction, promoting a relevant, enjoyable learning model for students.
Reflection: R4R was the first flipped, blended learning course employed at our medical school. The format provided a highly individualized, personalized learning experience for students; the flexibility inherent in the structure allowed students to progress and learn at their own pace. One student wrote, "This is what a 21st century medical education should look like—compelling, engaging, relevant, creative, [and] interactive." This work is proof of principle that these pedagogies can be effectively executed in a medical school curriculum. Future directions include continued faculty development, incorporating procedure-based sessions, assessing the impact on student preparedness for residency, and incorporating the flipped, blended learning model into other medical school courses at our institution. R4R can serve as a model for other health sciences curricula both within and beyond our institution.
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Short Communication 28: Obesity, Diet, and Exercise Education for the Primary Care Clerkship Using an Articulate® Storyline 2 E-Learning Module

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Purpose/Problem Statement: High rates of obesity and its associated comorbidities prompt many patients to seek physicians for healthy lifestyle counseling. Despite this, most medical schools fall short of minimum nutrition education recommendations, in part due to the fact that many institutions lack a dedicated nutrition course (1). Further, many physicians feel unprepared to address weight management and would favor additional training in this area (2). Thus far, it has been difficult to deliver nutrition education in the Columbia University primary care clerkship given its vast number of clinical practice sites offering varied nutrition expertise. This innovative project attempts to address this educational need by supplementing the current primary care curriculum with an interactive e-learning module created using the Articulate® Storyline 2 software. Storyline 2 is an emerging learning tool in medical education that offers the potential for active learning and simulated clinical decision-making. This flipped-classroom approach intends to provide medical students in a geographically dispersed primary care clerkship with practical knowledge and counseling skills related to obesity, nutrition, and exercise, as well as an understanding of registered dietitians' role in obesity management.
Methods/Approach: Learning objectives and a curriculum were developed based on a focus group conducted with senior Columbia medical students, a review of national guidelines on obesity management, and the guidance of a multidisciplinary nutrition curriculum steering committee. Learning objectives include identifying obesity risk factors and health implications; physical exam assessment; understanding the role of nutrition professionals and making appropriate referrals; ability to counsel patients on diet and exercise using motivational interviewing; and appreciating the importance of physicians' role in obesity counseling. The Storyline 2 e-learning module mixes narrated content with interactive exercises such as clickable diagrams, multiple-choice quesitons, drag-and-drop exercises, and clinical case scenarios. The module will be evaluated using a pre- and post-clerkship assessment consisting of a validated attitudes survey, a clinical skills self-assessment survey, and knowledge questions related to the module topics (see supplemental data). The creation of the module is currently in progress. IRB approval will be obtained by April 2016 in order to share data from the curricular design and pilot phases of this project.
Results/Lessons learned: The e-learning module will be implemented into the Columbia University primary care clerkship in January 2016. Due to faculty variability, many curricular gaps or orphan topics" such as nutrition and exercise counseling have limited reinforcement in the clerkship. This Storyline 2 module provides an innovative and engaging platform for preparing students to work with nutrition professionals during the clerkship and beyond. Coupling the e-learning module with a real-world interprofessional clinical experience would allow students to translate their learning directly into clinical practice.
Reflection: A search of the AAMC MedEdPORTAL using the terms articulate storyline, obesity, nutrition, exercise, and module did not reveal any published curricula on these topics that use Articulate® Storyline 2 as a platform. This e-learning module aims to increase the use of new media to deliver educational content that is accessible using virtually any device. In addition, this project will contribute to currently expanding areas of flipped-classroom learning, active e-learning, and interprofessional education between physicians and registered dietitians. Moreover, the teaching methods and platform used in this project have the potential to be generalized for other clerkships or in all four years of the medical school curriculum, and would likely be useful for other medical professionals including resident physicians.

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Short Communication 29: Developing and Teaching LGBTQ Competencies for Health Care Students in Brooklyn

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Purpose/Problem Statement: Through routine follow-up at Brooklyn Free Clinic, SUNY Downstate's student-run free clinic for the uninsured, we recognized a subset up of patients who reported that their student providers had made incorrect assumptions about their gender or sexuality and others felt unfairly judged after sharing sensitive sexual information. Furthermore, according to the Cultural Competence Education and Training Assessment Inventory (CCETA), convened by Association of American Medical Colleges (AAMC), the least commonly addressed educational goals in medical education were bias, stereotyping, and health disparities.1,2
Methods/Approach: In response, the student leaders of the clinic created and implemented a mandatory educational program for all clinical volunteers involved in direct patient care that addresses bias, stereotyping, and health disparities around gender and sexual health. Considering that our clinical volunteers include both medical and nursing students, we saw this problem as an opportunity for cross-disciplinary education. The training began with formal didactics that elaborated on a) assumptions, b) informed consent, c) gender, d) sexual intercourse and e) sexuality. In a facilitated group forum, medical and nursing volunteers discussed ways to manage their own bias and how to be accountable when mistakes are made. Volunteers were then able to practice history taking skills through role playing with previously trained student volunteers as standardized patients.
Results/Lessons learned: Our anticipated outcome was that students would feel more more comfortable discussing gender identity and sexual behaviors. All 33 participants responded to the pre and post surveys. 36% of students reported feeling more comfortable discussing both gender and sexual behaviors with patients. Approximately 30% of students reported no change in their comfort in discussing gender or sexual behaviors. Unexpectedly, 33% students felt less comfortable discussing both gender and sexual behaviors with patients. Additionally, on post-training surveys, more than 65% still wanted to learn more about gender identity as it relates to medicine or nursing. In response, we are developing modules for students to reflect on evidence-based health care maintenance plans and screening guidelines for transgender patients. Subsequent programming will include didactics, discussion, and role playing designed to strengthen knowledge in addition to highlighting health disparities within LGBTQ communities.
Discussions and conclusions/Significance: It has been shown that simple and concerted efforts to modify curriculum can improve students comfort in caring for patients, specifically transgender patients.3 Our educational programming is unique in that it is interdisciplinary through the student-run free clinic which provides a novel avenue for students to reflect on their own development without fear of academic repercussions. Despite our impressive reach to approximately 250 students at Downstate, we recognize the need to connect beyond our own volunteer base and to reach the entire student body. As a result, we are currently working with the clinical dean of students at Downstate to develop transgender medicine competencies for all medical students and we hope to do the same with nursing education leadership. Ultimately, we hope to collaborate with the administrative leaders of all health related professional schools at

Downstate. It is our intention that this additional training will give all Downstate students the skills and confidence to take an active role in directly addressing health disparities and commit to lifelong patient advocacy.
Reflection: Ultimately, we hope to collaborate with the administrative leaders of all health related professional schools at Downstate. It is our intention that this additional training will give all Downstate students the skills and confidence to take an active role in directly addressing health disparities and commit to lifelong patient advocacy.
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Short Communication 30: An Interdisciplinary Approach to Teaching Nutrition Counseling in the Pre-Clinical Years

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Purpose/Problem Statement: Nutrition is an essential part of health; however, many physicians do not feel competent providing nutritional counseling to patients [1]. The National Academy of Science suggests a minimum of 25-30 classroom hours dedicated to nutrition in pre-clinical years. Only 40 percent of U.S. medical schools are attaining this goal [1]. The large volume of material and reduced classroom hours make it difficult to meet this requirement. Thus, it is essential that the allotted time be used wisely to create a strong foundation that can be expanded upon in clinical years. Based on the theoretical framework of Kirkpatrick's classification system, inter-professional learning affects four categories of educational evaluation: reaction, learning, behavior, and results [2]. This study focuses on reaction and learning. Reaction is the evaluation of the learning experience by the students [2]. Learning is the effect on students' knowledge and skills [2]. This year, in addition to a lecture on basic nutrition and counseling, first-year medical students at the University of Connecticut School of Medicine (UConn) worked with UConn dietetics students to practice nutrition counseling and learn content in the context of patient cases. We believe this activity will enhance student learning as well as student satisfaction with the learning experience.
Methods/Approach: A total of 81 first year medical students enrolled in the Principles of Clinical Medicine (PCM) course received a lecture about nutrition and counseling from a physician and registered dietitian. The students were split into groups of 2-3. Each group of medical students worked with one dietetics student. First, the medical students interviewed the dietetics student who acted as a hypothetical patient in a clinical scenario. These scenarios included a pregnant patient with a history of anorexia, a patient with pre-diabetes, and a patient with hypertension and hyperlipidemia. Dietitian students provided feedback to the medical students on nutrition-focused interviewing and reviewed clinical questions pertaining to the cases to enhance learning basic nutrition principles. The students reconvened in their core groups and the medical students reported their findings so all students heard each case. Pre and post surveys were compared to evaluate medical student satisfaction with the curriculum and the students' perceived competence with nutrition material. First-year medical students will undergo a clinical skills assessment focused on nutrition counseling in February 2016. The

student scores on the nutritional counseling clinical case from this year's group and last year's students will be compared.
Results/Lessons learned: Of the medical student participants (n=81), when rating the quality of their nutritional counseling, on the pre-survey 88% rated it from poor to fair. On the post-survey 74% perceived the quality of their nutritional counseling to be good to excellent ($p<0.0001$). Interpersonal skills including student comfort in assessing a patient's readiness and motivation to change and in identifying cultural and social aspects that influence diet were significantly improved post survey ($p<0.001$). Communication skills including student comfort in providing the patient relevant information, developing a shared plan and making appropriate follow-up were significantly improved post survey ($p<0.001$). In the end, 94.5% rated their satisfaction with the nutritional counseling curriculum in the range of "somewhat satisfied" to "extremely satisfied". Seventy four percent of participants found working with dietetics students to be helpful or extremely helpful. The majority of students commented that they wished to work with additional professional students in the future.
Discussions and conclusions/Significance: This study aimed to teach nutrition curriculum to first year medical students through the collaborative interaction with dietetics students. We believe that this module acts as an effective method to promote interdisciplinary interactions and to improve understanding of nutrition while developing nutrition interviewing and counseling skills. This interdisciplinary model can be used to effectively teach other subjects in clinical medicine.
Reflection: This activity worked particularly well because the dietitian students were further along in their training than the medical students and were therefore able to provide better feedback on both content and counseling skills.
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Short Communication 31: Minimizing Harm, A Novel Approach to Teaching Safety Using a Team Based, Inter-professional Simulation Model in Residency

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Purpose/Problem Statement: The purpose of this study is to create a hands-on learning exercise on patient safety and quality care concepts using team based learning pedagogy with simulated application scenarios that allows trainees to apply learned knowledge and skills
Methods/Approach: The ACGME/CLER mandates formal education in patient safety. Teaching and learning patient safety requires demonstration of competencies such as teamwork, communication skills and recognition of systems error. The goal of this project was to design and assess the effectiveness of a Team Based Learning (TBL) exercise on patient safety and quality care concepts with interprofessional simulated application scenarios
Results/Lessons learned: A series of interprofessional patient safety training workshops were offered to internal medicine interns and undergraduate nursing students. The trainees were given pre-reading assignments related to fundamentals of patient safety principles. During the workshops, the trainees were grouped into interprofessional teams of 3-4 trainees. Each trainee first completed an Individual Readiness Assurance Test [IRAT] and then completed an identical

Team Readiness Assurance Test [TRAT] with his/her team members. Following the IRAT/TRAT exercise, the interprofessional teams went through a series of simulation cases (medication error/root cause analysis, effective hand-offs, and patient education teach back) with the use of high fidelity simulation mannequins and standardized patients. Following each case, trainees received immediate debriefing and feedback from multidisciplinary faculty members on teamwork and error prevention. Learning outcomes were evaluated using IRAT/TRAT. Safety checklists were used to identify omissions in safety tasks during the simulated cases. The trainees also completed the Readiness for interprofessional Learning Scale (RIPLS) before/after the workshop and a post workshop satisfaction survey.
Discussions and conclusions/Significance: A total of 76 trainees (26 Medicine interns and 50 nursing students) participated and twenty interprofessional teams were created. An independent samples t-test was conducted to compare the IRAT and TRAT scores. The TRAT scores (Mean=7.7, SD=1.8) were significantly higher than the IRAT scores [Mean=5.6, SD=1.7; $t(94)=-4.9$, $p=.001$]. Chi-square tests were used to compare the number of correct responses for each IRAT/TRAT question item. A significantly higher number of correct responses were selected on the TRAT compared to the IRAT on questions related to patient safety concepts: preventable adverse events, cognitive biases, and patient handoff concepts. Aggregate pre-post responses for the RIPLS were analyzed using an independent samples t-test. Although the RIPLS subscale scores for Teamwork and Professional Identity were higher on the post workshop survey compared to the pre workshop survey, the differences were not statistically significant. Over 90% of the participants either 'agreed' or 'strongly agreed' that the safety concepts they learned would likely improve the quality of care they provide to future patients
Reflection: Our study demonstrates that a collaborative TBL interprofessional simulation is an effective method for teaching patient safety core concepts. A simulation model centered on an interprofessional team can be used as an important training technique to teach health care professionals realistic, hands-on principles of patient safety.
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Short Communication 32: Implementing the Assessment of Interprofessional Collaborative Practice in Undergraduate Medical Education

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Purpose/Problem Statement: The medical field has long recognized that interprofessional collaborative practice (ICP) can enhance patient safety and quality and help to provide cost effective care.1 However, the more recent emergence of core entrustable professional activities (EPAs), which delineates the ability to collaborate as a member of an interprofessional team as a discrete unit of professional practice, reaffirms the significance of interprofessional education (IPE) within the undergraduate medical education curriculum.2 Although EPAs have been touted as means to translate competencies into clinical practice, there remains little empirical evidence, particularly in the realm of ICP, on how to best develop and implement tools to assess trainees' ICP-related performance and behaviors to support valid inferences.3 Thus, the purpose of this study was to examine the feasibility and validity of an ICP assessment approach within an IPE experience embedded in a third-year curriculum.
Methods/Approach: In the context of a longitudinal observed structured clinical examination spanning four days, approximately 100 medical students and 60 nursing students participated in a single-day simulated encounter involving 6 participants: a pair of medical students, a nursing student, and a pair of standardized patients – one representing the patient, and the other a

member of the patient's family. Provided with discordant information regarding the patient's treatment preferences, the session necessitated that medical and nursing students provide collaborative care and establish a plan of care with the patient and family. At the encounter's conclusion, all participants, including observing faculty members, completed an ICP assessment tool containing numeric and narrative items. The encounter concluded with a 20-minute structured debrief session. Univariate and bivariate data analyses are ongoing to examine the tool's validity.

Results/Lessons learned: Although results are contingent upon the completion of data analyses, the study team is examining the following questions, which will be available at the April 2016 NEGEA meeting: 1. What is the internal consistency of the ICP assessment tool and does it vary across trainee groups (e.g., medical and nursing students)?; 2. How do ICP scores vary both within and across trainee groups?; 3. How do trainee and standardized patient scores covary?; 4. How does narrative assessment add to the information gathered from the numeric assessment of ICP in the trainee groups?

Discussions and conclusions/Significance: Several preliminary conclusions can be drawn from the present study at this early stage. First, the study demonstrated the feasibility of developing and implementing a 360-degree assessment of ICP, and team performance more generally, involving assessment by self, peers, standardized patients, and observing faculty. Second, the ICP assessment tool provided faculty with a framework to enhance and deliver feedback to trainees and structure the session debrief. Ongoing analysis of the quantitative data will help to inform the true assessment of ICP and team performance in trainees.

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Short Communication 33: Sequential Participation in a Multi-Institutional Mock Oral Examination Is Associated with Improved American Board of Surgery Certifying Examination First Time Pass Rate

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Purpose/Problem Statement: We sought to determine whether sequential participation in a multi-institutional mock oral examination affected the likelihood of passing the American Board of Surgery Certifying Examination (ABSCE) on first attempt.

Methods/Approach: Residents from three academic medical centers were able to participate in a regional mock oral examination in the fall and spring of their fourth and fifth post-graduate year (PGY) from 2011-2014. Examinations consisted of three 30-minute rooms of four scenarios judged by two volunteer faculty examiners unfamiliar with the candidate. Candidates could obtain a maximum score of six points per examiner for a maximum score of 36. Candidate highest composite score of all mock orals attempts was classified as: risk for failure of the ABSCE with a score <28, intermediate if 28-31.9, and likely to pass if >=32. Factors including USMLE steps 1, 2, and 3, number of cases logged, ABSITE performance, American Board of Surgery Qualifying Examination (ABSQE) performance, number of attempts and performance in the mock oral were assessed to determine factors predictive of passing the ABSCE. Bivariate analysis was conducted using unpaired t-test, fishers exact, one-way ANOVA, with logistic regression for multivariable analysis.

Results/Lessons learned: One hundred and twenty-eight mock oral examinations were administered to 88 (71%) of 124 eligible residents. The overall first time pass rate for the ABSCE was 82%. Sixteen residents (18%) were classified at risk, 47 (53%) intermediate, and 25 (29%) likely to pass. ABSCE pass rate for each group was: 36% for at risk, 84% for intermediate, and 96% for likely pass [Figure1]. Candidates initially classified as at risk on their first mock orals attempt (n = 19) who then improved to intermediate or likely pass on a subsequent mock oral exam (n = 8) had an ABSCE 88% pass rate compared to 57% for those who remained at risk by subsequent score (p = 0.03). Four factors were associated with first time passage of ABSCE on bivariate analysis: mock orals participation in PGY4 (p = 0.05), sequential participation in mock orals (p = 0.03), ABSQE performance (p = 0.01) and performance on mock orals (p = 0.001) In multivariable logistic regression three factors remained associated with ABSCE passage: ABSQE performance, OR 2.9 (95% CI 1.3 – 6.1); mock orals performance, OR 1.7 (1.2 – 2.4); and participation in multiple mock oral examinations OR 1.4 (1.1-2.7).
Discussions and conclusions/Significance: Performance on a multi-institutional mock oral examination can identify residents at risk for failure of the ABSCE. Sequential participation in mock oral exams is associated with improved ABSCE first time pass rate especially for candidates whose performance improves on successive attempts.
Reflection: Mock oral examinations can be administered at minimal cost and though time consuming for faculty and participants provide reliable information on candidate preparedness for the American Board of Surgery Certifying Examination.
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Short Communication 34: Peer Assessment as a Component of Competency Assessment – A Decade of Evolution and Experience in the Double Helix Curriculum

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Purpose/Problem Statement: Structured peer feedback has long been proposed as a means to formatively assess competencies related to professionalism in medical students, given that one's peers are in an optimal positon to regularly observe habitual behaviors over varied encounters and settings.1 Furthermore, empirical studies of peer assessment (PA) have demonstrated that medical students can reliably assess dimensions related to work habits and interpersonal attributes,1 and that such assessments are predictive of future academic performance2, thus substantiating its use in medical education curricula. As health professions education increasingly focuses on competency based frameworks as a means to ensure public accountability,3 PA is positioned to aid in the assessment of competency domains relating to interprofessional collaboration and personal and professional development, which present unique measurement challenges and may thus necessitate the use of peer feedback.

Methods/Approach: Systematic and structured PA has been longitudinally embedded into our curriculum for over a decade and occurs in the first, second, and third years. Depending on the curriculum year, students evaluate between 6-10 peers and assignments are predicated upon contact in small-group activities and clinical rotations. Prior to the PA, students are required to attend an interactive workshop to discuss the PA process and review principles of providing high-quality feedback. Using an internally developed information system, PA is completed online using a 15-item tool that asks students to evaluate their peers on a range of behaviors reflecting the dimensions of work habits and interpersonal attributes.1 The PA tool also includes a section to provide narrative feedback on peers' strengths and areas for attention. Narrative feedback is reviewed for inappropriate comments by faculty/staff in advance of their release to students. The PA process culminates with the provision of a formal report of peer feedback to each student and their respective advisory dean, which subsequently informs a topic of discussion during an individual meeting.
Results/Lessons learned: Although developed and implemented over a decade ago, peer feedback remains a mainstay in our curriculum and is a testament to its importance in formatively assessing our students' cognitive and interpersonal attributes. Yet despite its longevity, the PA process has undergone considerable change to accommodate the evolving needs of our students and institution. Changes made include a shift from anonymous to authored peer feedback and the sharing of peer feedback with each student's advisory dean as means to encourage proactive processing of feedback and the identification/remediation of concerning behavioral patterns. More recently, we developed a structured PA activity in the first year as a means to provide important peer feedback at an early developmental stage. Although purposeful, these changes have underscored the importance of articulating the importance of PA, providing guidance in delivering and receiving peer feedback, creating a safe and respectful process that maintains confidentiality, and properly scaffolding and aligning the PA process with students' developmental/learning needs. In addition, our PA process has responded to the feedback of students and advisors as well as growing areas of importance in medical education.
Discussions and conclusions/Significance: PA remains a unique and important method to formatively assess professional competence in medical students. However, the medical education literature is devoid of applicable commentary on how to best develop, implement, and modify a PA process to align itself with the dynamic needs of its learners, educators, and the health professions field more generally. Thus, this commentary aims to fill this gap by providing medical educators with a model on how to implement PA in their own institutions and sharing the evolution of our longitudinal PA process.
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Short Communication 35: Constructing a Cooking and Nutrition Elective for Medical Students CHEFF (Cooking Healthily and Efficiently with Fresh Foods)

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Problem Statement: Despite a fascination with celebrity chefs, Americans have never done so little cooking at home[1]. With >50% of premature morbidity and mortality attributed to diet and

other behaviors[2], cooking with minimally processed foods can improve health and decrease healthcare costs. Nutrition can seem dull to medical students and patients alike. A central goal of CHEFF is to help medical students learn to translate nutrition information into patient-friendly food suggestions. Teaching medical students cooking skills and food patterns from diverse cultures assists both with self-care and teaching patients to cook rather than eat fast food.

Approach: This six session cooking elective was launched in 2015 with 8 first-year students. For 2015-2016, a 2nd section was added for 2nd year students. CHEFF is built on a "flipped classroom" active learning framework so that the actual session can be almost entirely experiential[3]. For the first 5 sessions, students receive packets of recipes and nutrition articles a week before the session. They are expected to come to the session familiar with the material. They prepare, eat, and discuss in Einstein's kitchen a healthy internationally-themed dinner that reflects the Bronx patient population's cultural diversity. The course director lightly guides the cooking process. The 6th session is the culmination of a month-long term project where dyads of students first write a short literature review on the pros and cons of a dietary approach, and then research and test representative recipes. During the final session they prepare the recipes and briefly discuss the dietary approach during the communal meal. They are also asked to boil down what they've learned into a short low-literacy explanation for patients. Earlier in the elective the students analyze their own diets for 3 days and select a habit to work on. They write a behavioral contract for this and document their change process for one month. The course evaluation consists of the following: 1) a pre-post questionnaire on personal dietary habits and perceived nutrition counseling skills; 2) the two projects; 3) cooking skills improvement; and 4) a short final exam. In January 2016, when the second CHEFF cycle finishes, a statistical analysis will be done using the Wilcoxon signed rank sum test to compare the pre-post questionnaire changes on the first 16 CHEFF graduates.

Lessons Learned: Despite no academic credit, CHEFF was filled with a long waiting list within three hours of posting. We found students overestimated their diet's quality. The pre-course evaluation showed that although 75% of registered students felt their diet quality was good, their answers indicated otherwise as only 50% ate 2.5 cups of vegetables 2-3x/wk or ate eat fish/seafood 2-3x/month. Only 25% cook > 3x/week and 88% felt they couldn't counsel patients from diverse backgrounds about diet. Adequate preparation for a cooking elective is essential. A "dress rehearsal" session helps ascertain that cooking, eating, and cleanup can be done in the allotted time. Students' food preferences and allergies should be discussed at the first session and menus adjusted. Students come to a cooking course with markedly different levels of food preparation skills. They should be evaluated on their improvement rather than an absolute standard.

Significance: A number of medical schools are experimenting with cooking clubs, classes and collaborative arrangements with local cooking schools. The *Dietary Guidelines for Americans, 2015* emphasizes healthy dietary patterns rather than individual nutrients. Helping medical students understand these guidelines "from the plant roots up" is a key objective of CHEFF. The impact of these new skills on long-term patient counseling will need to be evaluated in the near future. If there is significant impact, an additional challenge will be to find ways to make such courses available to larger numbers of medical students.

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Short Communication 36: Applying Vascular and Cardiac Sonography to Improve Medical Student Performance of Cardiac Auscultation and Assessment of Jugular Venous Pulsations

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Purpose/Problem Statement: The authors identified three challenges to the optimal means of teaching bedside cardiovascular physical examination to pre-clerkship medical students: 1. Bedside examination of the cardiovascular system, in particular the assessment of jugular venous pulsations and analysis of heart sounds, is difficult for clinicians to teach and for students to learn1,2. 2. The optimal timing, quantity and depth of medical student training in point of care ultrasound and the resultant medical student competencies in these skills are not known. 3. In the absence of sufficient faculty members competent and/or available to teach medical students point of care ultrasound, what other content experts can be engaged to plan and teach these skills?
Methods/Approach: We implemented an innovative interprofessional educational session to improve first year medical students' competency in bedside cardiovascular physical examination while also facilitating integration of basic cardiac physiology/pathophysiology and cardiac physical examination. Students have three pre-session assignments: (1) practice basic cardiovascular physical examination techniques taught in two sessions the prior week. (2) read a brief introduction to fundamental ultrasound physics, technology and transducer technique authored by a medical sonography faculty member. (3) watch a video recorded lecture covering cardiac anatomy and the most common cardiac sonography views. In a single two-hour session, first year medical students rotate through four stations: (1) Assessment of jugular venous pulsations on standardized patients under school of medicine faculty member guidance. (2) Learn from diagnostic medical sonography students about basic ultrasound technology and transducer technique and subsequently practice vascular ultrasonography on the neck of a standardized patient. (3) Assessment of cardiac palpation (PMI) and auscultation under school of medicine faculty member guidance while simultaneously watching a four-chamber cardiac sonography view of the same standardized patient. (4) Learn from cardiac sonography students about basic techniques of cardiac sonography and subsequently obtain the four-chamber view for medical students in station 3 above to watch.
Results/Lessons learned: The educational activity was implemented in 2014 and 2015 and we are currently preparing to implement it again in 2016. A review of course evaluation and student surveys demonstrates that learner satisfaction with this event has been very high. Self-reported medical student confidence in independently assessing jugular venous pulsations, assessing PMI, and interpreting heart sounds improved after the session. Medical students particularly enjoyed learning from sonography students while the sonography students enjoyed teaching future physicians about the role of the sonographer on the health care team, in addition to songraphy technology and technique. While coordinating this session requires significant interdisciplinary cooperation and extensive planning, all faculty leads are committed to continuing to provide this educational activity for years to come.
Reflection: This educational session is an example of how sonography was successfully introduced into an introductory clinical skills course to improve medical students' confidence and competency in the cardiovascular physical examination. This is of particular importance for those schools that still believe in the importance of teaching traditional bedside clinical skills while also realizing that point of care ultrasound will likely become increasingly common during the careers of current medical students. Additionally, we feel that our model of sonography students teaching medical students is novel and its success may be due, in part, to reversing

traditional power dynamics in health care teams. We would suggest this approach be considered as a best practice in implementing other interprofessional educational experiences3.
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Short Communication 37: The Teaching Milestone: A Forgotten Marker in Graduate Medical Education?

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Purpose/Problem Statement: Medicine is built upon a tradition of teaching. The image of the physician as an educator sharing knowledge with subsequent generations is a hallmark of the profession. Many physicians take on teaching roles early in their training, providing education and supervision during the first weeks of residency. The ACGME explicitly notes in the Common Program Requirements that residents must “participate in the education of patients, families, students, residents and other health professionals” as a measurable outcome for the “Practice Based Learning and Improvement” core competency.1 The ACGME-approved specialty-specific “milestones” are a framework for determining resident performance within the six ACGME core competencies. They provide a basis to evaluate a trainee’s development toward key elements of physician competency.2 Despite these requirements and the important role of the clinician-educator, it is unclear whether these milestones properly address the progression of residents as teachers. We sought to determine the degree to which ACGME-accredited specialties employ a dedicated ”teaching” milestone to evaluate residents.

Methods/Approach: Two investigators (SM, XZ) independently reviewed the milestones for each of the 27 ACGME-approved specialties. The reviewers first utilized a keyword search using the terms “teach,” “educat,” and “mentor” to identify potential milestones that described the progression of residents as educators over the course of training; both authors subsequently reviewed all 27 documents in detail for teaching-related milestones that may have been missed using keyword searches. Teaching milestones were defined as those describing “outcomes that reflect the development of a resident as a clinical and/or didactic educator over time beginning no later than Level 2.” A third investigator (SR) was consulted for any discrepancies about teaching milestones to make a final determination.
Results/Lessons learned: We identified 10 specialties (37%) with a dedicated teaching milestone. Of these, 8 fall under the core competency of Practice-Based Learning and Improvement, which is consistent with the ACGME program requirements. Other core competencies that contain teaching milestones include Medical Knowledge (1) and Interpersonal Communication Skills (1). Inter-rater reliability between the two primary reviewers was high ($\kappa = 0.922$).
Discussions and conclusions/Significance: The number of ACGME-approved specialties using dedicated milestones to track development of residents as teachers is sub-optimal. We used strict criteria for our definition of a teaching milestone and one of the consequential limitations of this is the exclusion of potentially useful milestones that describe the development of the resident as an educator in more limited terms. Many such milestones constrain the descriptions of the resident clinician-educator to senior residents (Level 4) or aspirational goals

(Level 5). We feel that the relative importance of the clinician educator skillset warrants a dedicated milestone. Fortunately, the milestones were always intended to undergo refinement after the initial period of implementation,3 so there will be opportunities in the future for each specialty to revise and optimize its milestones. Additional research in this area can guide this process by: 1. identifying the manner in which some specialties describe the resident as an educator within their milestones, 2. determining whether existing teaching milestones adhere to sound educational principles, and 3. analyzing the validity of the teaching milestones currently in use.

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Short Communication 38: Point-of-Care Ultrasound: The UME-GME-CME Continuum

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Purpose/Problem Statement: The evolution of the point-of-care (POC) ultrasound machine has far outpaced the formal training of trainees and faculty in its use. At the undergraduate medical education (UME) level, there are limited opportunities to integrate training and neither a model curriculum nor a national consensus on the role of POC ultrasound exists. At the Graduate Medical Education (GME) and Continuing Medical Education (CME) level, POC ultrasound training is often conducted on a voluntary basis making it challenging to standardize requirements and to determine the basis for competency. Numerous studies have shown that POC ultrasound can improve patient safety, quality and cost-effectiveness 1. Our aim was to develop a framework for a model longitudinal competency-based curriculum in POC Ultrasound spanning the UME, GME, and CME continuum.

Methods/Approach: We developed a competency map across the UME, GME and CME continuum for ultrasound-guided CVC (central venous catheter) placement that could eventually be linked to educational and patient outcomes. We chose CVC placement based on prior research among Critical Care fellows on skill retention, acquisition and decay. Prior research has also shown that medical students are able to earn high passing scores at an ultrasound-guided CVC skills station on a task trainer after a brief training session 2. We developed our competency map around certain critical components of ultrasound-guided CVC placement: physics, equipment, image acquisition, image interpretation, environment, integration into clinical decision-making, procedural guidance, and broader content. The levels of competency include novice, advanced beginner, competent, proficient, and expert.

Results/Lessons learned: Currently, POC ultrasound training predominantly occurs at the GME level. The competency map assumes that an individual learner may be at any point from novice to master irrespective of their position along the UME-GME-CME continuum.The major challenge has been the recruitment of trained faculty to expand teaching efforts across the UME-GME-CME continuum.

Reflection: Our competency map is unique in that a resident may be competent, while a faculty member may be an advanced beginner. The map serves as a framework to guide learners across the continuum in the fundamental skills required for this particular POC ultrasound application.

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Short Communication 39: Remote Standardized Patients (RSPs): Opportunities and Challenges when Connecting SPs and Learners Remotely

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Learning Objectives: By the end of the session participants should be able to: - supplement clinical training with practice and feedback opportunities by engaging with Standardized Patients remotely - examine the ability of Standardized Patients to provide a valid and reliable patient encounter remotely - explore the use of teleconferencing (e.g., Skype) and web-based recordings (e.g., SuperTintin) for clinical training
Methods/Approach: Sometimes it is difficult to bring learners and Standardized Patients (SPs) together, in the same place, at the same time. With Remote Standardized Patients (RSPs) who interact via the Internet (e.g., using Skype) one can overcome many of these barriers. In addition one can prepare learners for telemedicine, a healthcare modality that is rapidly gaining momentum. Software programs such as Supertintin allow the recording of voice and video streams created in Skype. Thus they provide an opportunity to review encounters at a later time for additional evaluation and feedback, research and/or quality control. Web-based simulated clinical encounters were first introduced by Lenz LM et al, at the Medical College of Georgia (1999) to address the isolation of a decentralized student body. Drexel University Medical School followed suit soon thereafter (Novak D et al., 2002). A series of web-based OSCE encounters made it possible to connect Philadelphia-based SPs with Pittsburg-based clerkship students without requiring travel by either. Other formats include the integration of a single web-based encounter to address telemedicine-related communications skills in an otherwise face-to-face OSCE (Yudkowsky R et al. 2011), and the use of a single RSP encounter to teach about cultural competence with ethnic SPs who are not frequently encountered at the training location (Arthur M et al., 2010). Teleconferencing is also increasingly been used to train SPs and raters. Again it appears to be cost effective and time-saving to meet via the internet rather than in person. In 2012 the National Board of Osteopathic Medical Examiners (NBOME) also explored the use and feasibility of remote encounters for training clinicians. A committee was created to develop scenarios and rating forms and to train the RSPs. Nine technologies ranging from email to survey monkey were used to implement and evaluate this program. The pilot included 59 residents (multiple specialties) from across the US who each completed 4 RSP encounters related to pain management. The RSPs were located in California, New York and Pennsylvania, all were trained via Skype. Within a 3-month time frame 236 clinical encounters were completed. (Langenau E et al, 2014, Horber D et al, 2014). A vigorous program evaluation using quantitative and qualitative methods provided some answers about user acceptability from learners as well as RSPs. Other institutions such as Weill Cornell Medical College are exploring similar programs for undergraduate medical leaners. By now this methodology has been introduced at multiple conferences inside and outside the US. As institutions have to provide more practice opportunities and more frequent assessments they have to consider new strategies to bridge time and geographic barriers. This workshop will explore multiple approaches to interacting with RSPs. Demonstrations will include videotaped and live remote interactions (e.g., using Skype) with SPs who are located in Singapore and South Africa. For the latter audience volunteers will take on the role of clinician. A discussion about the opportunities

and challenges presented by this methodology will summarize the session and help participants transfer the newly acquired understanding and skills to their own work settings.
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Short Communication 40: Launching a Simulation-Enhanced “Capstone Curriculum” for Graduating Medical Students in the Absence of a Sim Center R. Rosen, A. Sein, B.F. Richards, J. Amiel, J. Iyasere, C. Hsieh, R. Lynch, R. Nowygrod, A. Advincula Columbia University College of Physicians and Surgeons

Purpose/Problem Statement: Simulation offers a method to improve learner confidence and ability in safe settings. Many medical schools have developed curricula to improve their graduates’ procedural skills with improved outcomes in graduates pursuing careers in surgery and medicine. However, launching a capstone without a brick-and-mortar simulation center is challenging.
Methods/Approach: We implemented a one-week elective simulation-enhanced Capstone curriculum for graduating seniors. In the absence of a specially-equipped physical space dedicated to simulation, we aggregated resources from across the academic medical center including space (classrooms and the anatomy lab), equipment (demonstration models, ultrasound, and mannequins) and teachers (trained faculty and housestaff in procedural teaching and sim-based team training and debriefing). The highly collaborative process was led by faculty leaders from the departments of medicine, surgery and obstetrics and gynecology. In the first four days, students worked through a series of cases, simulations and procedure workshops in small groups. On the fifth day, students practiced interpersonal skills in sessions using standardized patients. We measured the following outcomes: Reaction: students’ confidence in diagnosis, treatment and skills using surveys and a focus group immediately after the capstone. Learning: students’ knowledge using pre- and post -quizzes. Behavior: participants’ reflections on the start of their internship after four months of residency, and program directors’ observations after nine months of residency (results pending).
Results/Lessons learned: Ninety senior medical students participated in one-week Capstone electives, offered in April and May 2015. We found significantly improved confidence in diagnosis, treatment, clinical skills and interpersonal tasks compared to baseline ($p<.001$) (see attached image 1). All students rated the overall course as “good” (n=5) or “excellent” (n=45). Quiz evaluations demonstrated a significant improvement in key medical knowledge ($p<.001$). The high-fidelity mannequin simulations were the most popular sessions, while the standardized patients were the least popular (see attached image 2). Student feedback included desire for tailored residency-specific sessions, as well as an increased emphasis on practical residency survival skills (see attached supplemental data).

Reflection: In this pilot, we launched a simulation-enhanced Capstone curriculum for graduating medical students, which improved students' confidence and knowledge and was well-regarded by participants. We were able to offer this course without a physical simulation center using a collaborative resource-sharing approach. We plan to follow up with our participants and their program directors to evaluate the utility of this program in improving confidence during the early months of residency, and to adapt this course for future years based on student feedback.
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Short Communication 41: Patients Don't Offer Multiple-Choice Answers— Defining the Value of Essay-Based Exams in an Integrated Curriculum

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Purpose/Problem Statement: Though the tenet "assessment drives the learning process" is an accepted principle in medical education and "integration" is a goal in curricular reform and innovation movements, little is known about best practices of assessment to complement an integrated curriculum (1).

Methods/Approach: The Hofstra North Shore-LIJ School of Medicine's curriculum was designed to enhance students' abilities to apply the how and why of basic science to clinical medicine and thus, to demonstrate knowledge in action (1). In considering assessment, our goal was to create a system that appropriately complemented the curricular expectations. In thinking further, we realized that traditional methods of knowledge assessment were predominantly based on multiple-choice questions (MCQs) and concluded that this would not meet our goals as MCQs could not accurately capture the depth of what our students were expected to learn. Instead, we designed an innovative system, one that was essay-exam based. We used Van Der Vleuten's five criteria (reliability, validity, impact on future learning and practice, acceptability to learners and faculty, and costs) for considering the usefulness of particular methods of assessment (3). We conclude that essay-based examinations better align with the goals of an integrated curriculum and offer enhanced opportunities for learning from both the student and faculty perspective. We therefore employ an innovative assessment system premised on essay-based examinations framed by Bloom's taxonomy to complement our integrated curriculum. Essay-based assessment systems offer opportunities to faculty and students that are either absent from, or minimized by MCQ based assessment systems. As supportive evidence, we share the faculty and student experience of essay-based assessments from the past five years.
Results/Lessons learned: 1. Whereas multiple-choice exams test recognition, essay exams require recollection of material. This challenges students to demonstrate a deeper level of learning. 2. The answers to essay-based examinations offer faculty a comprehensive assessment of students' abilities to apply principles of basic science to clinical scenarios. 3. In addition to medical knowledge assessment, essay-based exams provide an opportunity to provide feedback to learners regarding their written communication skills and professionalism, such as the occasional use of slang and casual language in a minority of student essays. 4. Based on three consecutive classes whose average score was above the national mean with a >99% pass rate, we conclude that USMLE performance is not adversely affected by a non-MCQ based assessment system.

Discussions and conclusions/Significance: As medical and health professional schools move in the direction of integrated curricula, it is critical to identify effective and appropriate assessment systems. Furthermore, as the title suggests, patients will never offer multiple-choice answers, so it is incumbent upon the medical education community to offer students opportunities to describe their thought process on paper as a preparation for sharing their thoughts with patients and preceptors, both real and standardized. Our experience suggests many potential benefits to assessment using an essay-based system without evidence of adverse outcome based on USMLE Step 1 data. The chief barrier to implementing such a system is the time demanded of faculty who must create and grade questions.
Reflection: As a next step, we plan to study the time resources required for an essay-based exam more comprehensively. In addition, best practices for question design and feedback as a critical component of an integrated curriculum will be explored further.
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Short Communication 42: Development of a Tool to Assess Outpatient Handoffs as an Entrustable Professional Activity (EPA): A Pilot Project

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Purpose/Problem Statement: We set out to develop an observation tool to be used by trained observers to assess our residents' ability to handoff their primary care patients at the end of their internal medicine residency.
Methods/Approach: Each year, thousands of internal medicine residents graduate from residency, and responsibility for their primary care patients is transferred to junior residents. These transfers, often unstructured, carry inherent risk for patients. The ACGME and AAIM have mandated competence in patient handoffs. There are no published curricula or systems to facilitate this process. Many residency programs are not training their residents on the steps needed for a safe and thorough handoff. Given the many barriers to direct observation, few programs are watching to see if their residents are competent to complete this task before graduation.
Results/Lessons learned: As part of a newly developed protocol for end-of-residency handoffs in our ambulatory clinic, we invited the residents to attend a handoff workshop and participate in our project. We developed a handoff tool for direct observation of end of residency patient handoffs as an Entrustable Professional Activity (EPA). Our observation tool was developed by adapting a tool developed for inpatient pediatric handoffs using the ABIM and AAIM milestones and EPAs. Two clinician educators reviewed and revised. It was further assessed by an additional clinician educator and a statistician. The new workshop and handoff protocol were piloted with 10 pairs of residents. Each handoff was observed by two trained observers. A total of 100 handoffs were observed.
Discussions and conclusions/Significance: The results of these observations showed that the raters were able to use the tool to assess end of year handoffs and were consistent in their rating of the residents. The residents were similar handoff to handoff. We used Generalizability theory or G theory to look for error in these results. The decision to use G theory over Classic Testing Theory was made because G theory allows the investigators to assess the reliability of performance assessment when there are multiple variables.

Reflection: In our pilot project we directly observed residents performing an important entrustable professional activity using an anchored assessment tool. Future work needs to be done to validate this observation tool.
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Short Communication 43: Establishing Standards to Measure Clinical Reasoning of Second-Year Medical Students

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Purpose/Problem Statement: LCME (ED-28) (1) requires ongoing assessment of students' clinical reasoning. Yet, establishing standards to put assessment results into a useful or meaningful context remains challenging. This multi-institutional study aimed to measure clinical reasoning among second-year medical students and develop a reliable method of standard setting for this essential competency.
Methods/Approach: Three different medical schools agreed to use a post-encounter note (PEN) specifically to measure clinical reasoning as part of an OSCE administered at the end of their second-year clinical skills course/curriculum. To complete the PEN, students were instructed to list the three most likely differential diagnoses and support them with evidence from the history and physical exam. Over the course of the two-year study, 444 second-year medical students completed a PEN for each of two cases at each of the three institutions. To grade the PEN, all three medical schools created objective grading rubrics specific to their OSCE cases using faculty consensus, but the scoring point system was the same among all schools. Two points per correct diagnosis were given for up to three correct diagnoses (maximum of six points) and one point for each item of supporting evidence per diagnosis (maximum of three points per diagnosis for a total of nine points). In addition, all three institutions employed the same five-point global clinical reasoning rating measure with descriptive anchors. MDs scoring the PENs received training using the grading rubrics, scoring point system and global clinical reasoning rating measure. IRB approval was obtained at all institutions.
Results/Lessons learned: Inter-rater reliability (kappas) among graders after scoring a pilot batch of PENs from each institution was acceptable: Differential Diagnosis: 0.69 to 0.82; Supporting Evidence: 0.58 to 0.73 and Global Reasoning: 0.53. Data analysis seeking associations among scores on the PENs and clinical performance (history, physical examination and interpersonal scores on the OSCEs) will be completed before spring 2016. Selected evaluation items from students' first clerkship regarding clinical reasoning will be used as an external measure to validate results of the PEN scores. We'll employ a borderline group regression method of standard setting (2) to create a passing standard in clinical reasoning. The method utilizes a five-level global rating scale (clear fail, borderline, clear pass, very good pass, excellent pass) with quantitative scores from a checklist to determine the passing standard of a

performance-based assessment. Passing is defined as the point where the mean score for the borderline group intersects the mean score regression line.
Discussions and conclusions/Significance: We anticipate that the ability to set standards for clinical reasoning competency among three different medical schools will set us on a path to establish a universal benchmark that other medical schools can adopt. Further, we expect that this method for evaluating students' competency in clinical reasoning will correlate with an external measure of clinical reasoning in the clerkships, thereby helping to validate our results.
Reflection: We have learned a great deal from each other as a result of our collaborative efforts in terms of knowledge about clinical assessment methodologies and standard setting. In additon, our discussions have provided a forum for sharing our experiences of clinical skills teaching and assesment as well as our challenges and solutions to these challenges. We look forward to the analysis of our data, which we anticipate will enlighten us even more. We would also like to acknowledge that this study was generously supported by a grant from the 2013 NEGEA Collaborative Research Grant Program.
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Short Communication 44: Integration of Clinical Skills and Medical Knowledge in Problem-Based-Learning

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Purpose/Problem Statement: Clinical Skills and Basic Science education is often learned in parallel curricula. This lack of integration and relevance to medical knowledge and patient care deters effective skills acquisition and hinders a cohesive medical education1,2.
Methods/Approach: In our new competency-based curriculum, Problem-Based Learning (PBL) drives the curricular subunits by providing a reference for other instructional sessions, both in regards to clinical skills and basic science learning. We designed PBL sessions that provide an opportunity for students to model, practice, and reflect on relevant clinical skills along with acquisition of clinically relevant biomedical knowledge. The cases are initiated by students interviewing Simulated Patients. Students receive instruction and feedback from a clinician, or Clinical Skills (CS) facilitator, on communication skills, hypothesis-driven history and clinical reasoning during the interview. The same CS facilitators meet weekly with their small groups of students over an 8-month period to provide a consistent longitudinal learning experience. Students use the history gathered and subsequent physical examination findings, lab and imaging disclosures to identify knowledge gaps. Resolution of these gaps drives the formulation of 'research questions' that lead to the desired biomedical learning objectives. Students return in subsequent sessions to discuss their research with their Unit facilitator, a basic scientist or clinician with basic science experience.
Results/Lessons learned: Students rated PBL as highly effective (Graph 1); facilitators were impressed with student skills and group function. Continuity was achieved across alternating CS and unit facilitators using extensive facilitator manuals, in-class methods that supported student autonomy, linearity of contact of both facilitator cadres, and co-attendance of facilitators when feasible. Complementary backgrounds of CS and Unit facilitators required faculty development emphasis on Socratic facilitation and providing feedback, respectively. Student reflections and self-assessment at the end of each session were effected with variable results in different groups. A single form and identical anchors for student evaluation proved awkward for capturing the different experiences of the two facilitator groups. Separate narrative evaluations by CS and

Unit facilitators appeared to promote discussion and a shared decision on the student performance.
Discussions and conclusions/Significance: Our experience is significant because there is very little experience elsewhere with teaming clinical and basic science facilitators across different segments of the same case to integrate clinical and basic science teaching, and our approach suggests a way this can be done effectively. We are enhancing the co-facilitated PBL via improved systems for student evaluation, greater linearity of Unit facilitators' contact, skills workshops and case post-mortems, and targeting the issues identified above in student and faculty surveys.
Reflection: Three years into our implementation of integrated Clinical Skills small-group sessions with PBL we are making progress toward our initial goals. Logistics are smooth and student and faculty satisfaction are good. Future challenges include improving assessment and feedback to students by facilitators, achieving tighter collaboration between the Clinical Skills Educators and the Unit faculty members who facilitate at different sessions, and outcome-based assessment of effectiveness.
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Short Communication 45: The Finding Information Framework (FIF) – A Tool to Structure a Longitudinal EBM Curriculum and Train Students to Find the Best Information at the "Point-of-Learning" and the Point-of-Care

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Purpose/Problem Statement: In this age of rapid information expansion, medical education can no longer be structured solely around information acquisition. We need to teach the concepts and lifelong learning skills of information management and information mastery to be used at the "point-of-learning" and later applied in the clinical setting at the point-of-care. These concepts can be difficult to teach, and traditional approaches taught in medical school curricula have focused mainly on concepts of study design, evidence based medicine theory, and the primary literature, and less on effective application of evidence in real time at the point-of-care. When a medical student and later a physician is placed in the clinical setting and is searching for an answer to a question that is needed to inform a patient-care decision, the traditional approach becomes inadequate. Most medical students and physicians are not experts in biostatistics, so cannot be relied upon to adequately appraise every article needed to inform their patient care; and they certainly would not have enough time to do so even if adequately trained. Additionally, even if a medical student or physician were to critically appraise an article to make a patient-care decision, how do they know the article they are reviewing is not contradicted by 5 other articles stating the opposite? This challenge is further compounded by the tremendous and continuous growth in the body of medical and other information. For example, 1,189,548 articles were published in PubMed in 2014 alone. The current generation of medical students are digital natives. They are used to quickly and easily accessing all kinds of information from devices at their fingertips. Not all medical questions they have are appropriate for a PubMed search, and there is not one perfect information resource to answer every question. As medical educators it is our responsibility to teach our students to understand

different types of questions and different types of information resources. We must then give our students the knowledge and skills necessary to evaluate information resources so that they know what types of questions that resource is best for, and how to evaluate the quality of the resource and the information it provides. Once we have given that to our students, we can send them out into the medical world equipped with the lifelong learning skills needed to be effective physicians in the information and digital age.

Methods/Approach: There is a paucity of developed curricula to teach these difficult concepts and skills to students throughout the four years of medical school in a way that builds on itself and is relevant to students. Our approach emphasizes the principles of adult learning theory and highlights the continuously changing and growing nature of the body of medical information. It develops our students into lifelong learners who can perform accurate self-assessment of their own learning needs, and can use information resources both for their own education, and for application during patient care. Our integrated curriculum includes knowledge and skills in the realms of information management, information retrieval, information mastery, and evidence-based medicine. These concepts can be difficult to teach, so we have developed the "Finding Information Framework" (FIF) – a conceptual algorithm, web-based tool, and App – to structure how learners ask and categorize their questions. The FIF then links the user directly to the most appropriate information resource to answer their question. This framework is the basis of our longitudinal EBM/Information Mastery curriculum which is woven throughout the four years of the medical school. This curriculum and framework was developed by the Evidence-Based Medicine Vertical Integration Group, an interdisciplinary group of faculty and students including faculty from the medical library. The Finding Information Framework is designed to be a student-centered tool, which starts with students generating a question (based in the concepts of adult learning). The FIF takes learners through an algorithm to define their question first by determining whether it is a background or a foreground question. Once they continue down the algorithm, background is split into basic science or clinical. Clinical background is further split into common and rare/academic interest. Foreground questions are defined as always being clinical, and are split into point of care, rare/academic interest, and resources/services. Once the student is able to put their question into one of these final categories, they are directed to the appropriate information resource group to answer their question. Each information resource group has a list of our recommended resources. In the web-based version and the App, the user can then click directly into the actual information resource. This framework and its concepts are taught to students early in the first year, reinforced throughout the curriculum, and builds on itself over the four years. It is used in multiple courses including the medical library curriculum, the EBM/biostatistics course, the problem based learning course, and the Family Medicine clerkship. The feedback from students has been overwhelmingly positive, with an emphasis on how logical and relevant it is to their learning needs. The Finding Information Framework is used in multiple ways throughout the curriculum. It is introduced and used in didactic sessions of multiple courses. Students then use the web-based version and App in their small groups, research projects, and to answer questions in their various courses. Their research and presentations in the problem based learning course are evaluated based on how effectively they used the FIF for their research. With the foundational skills and knowledgebase provided in these courses, students then incorporate the concepts into how they think about and approach subsequent searches for information/answers, and utilize the web-based and App versions of the FIF as a quick portal to the best information resources for their questions – both at the point-of-learning and at the point-of-care. Higher level skills are then taught in subsequent curriculum years, for example, providing EBM in real time at the point-of-care and advanced application of EBM (shared-decision making, NNT, etc).

Results/Lessons learned: Three lessons learned should be noted. First: The current generation of medical students are digital natives for whom the rapid growth of information is not surprising nor unnerving. Our approach to teaching the skills and knowledge of information

management, with the ultimate goal of giving our students the skills for a lifetime of evidence-based practice, resonates with our learners, and is natural for them. It has been, at times, however, unsettling for faculty. Once we start to "pull back the curtain" on information and information resources, we often find that many of our clinical practices are not based on as high a level of evidence as we had thought. This has informed how we present the FIF to our faculty. The FIF has been an effective teaching tool for use in our medical school curriculum, but has also proven useful as a faculty development tool, particularly for faculty teaching in small group and other settings. Second: With such easy access to vast amounts of information, our students are instantly searching for information and answers to their questions in all realms of life. Given their proficiency in this skill, they are quick to search their phones or computers for the answer to any question they have. This immediate access to information can lead some students into a false sense of being able to find the "right" answer to any question almost instantly. Their reliance on various internet sources can create a trap that leads them to simplify how they think about and critique the questions they are asking and the information resources they are using. We therefore strongly emphasize the point that there is no one perfect resource for every question, and that they will use a long list of resources in the various places they work over their entire careers. It is therefore essential that they understand how to "pull back the curtain" on any information resource – to be able to quickly find out what that resource is saying, where the information came from, and how the resource came to its conclusion. Third: An additional lesson learned came from the timing of the roll out of the FIF with students in the first year curriculum. Because of scheduling logistics, in different years we have done the initial presentation and training on the FIF either early in the first year or midway through the first year curriculum. We have found that when we present it very early, students do not have the experiences of struggling in their searching, trying to get clarity on their questions and figuring out which information resources to use. Without that experience, they simply learn the FIF, it makes sense to them, and they use it. When we have presented the initial FIF presentation midway through the year, it is clearer to students why this type of systematic approach is important. With this timing, they have now experienced the overwhelming morass of information out there, and therefore understand better why a systematic approach to categorizing questions and using appropriately identified information resources is important. We have found that this approach creates a more impactful learning experience – better instilling in our students the importance of understanding where and how to search for information.

Discussions and conclusions/Significance: The quantity of information in the medical literature and the world generally will only continue to grow. We do not want our students to randomly search for answers to their questions in the closest available information resource, as that is not always the best source of information. While we want to provide our students with appropriate information resources to easily answer their questions, we also want to provide them with the knowledge and skills needed to evaluate resources for themselves, so that when they are out in practice in any setting they are able to find the best information to inform their patient care. The Finding Information Framework provides a conceptual framework that enables teaching these knowledge and skills. It also provides a quick portal to access the best information resources for the questions our students have. It is a student-centered tool that has proven an effective teaching tool for faculty and students, as well as a quick portal to the best resources for our students' questions.

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Short Communication 46: Designing, Implementing and Evaluating a Faculty Development Program Centered on How to Teach Clinical Reasoning to Novices

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Problem Statement: Clinical or diagnostic reasoning refers to the mechanism by which clinicians gather and process information to generate a diagnosis and plan of management[1]. Analytic reasoning is conscious, slow, hypothesis-driven, and requires effort and purpose. Non-analytic reasoning, by contrast, is unconscious, automatic and fast, allowing the expert clinician to quickly recognize patterns or illness-scripts, developed through years of training and practice. Novice students tend to use analytic reasoning because they have not yet acquired and organized their knowledge to reason intuitively. Clinician educators, however, can find it difficult to explain their deeper, non-linear reasoning processes to students as they work through a case.

Approach: To address these challenges, we designed a faculty development program to teach clinician educators how to foster students' clinical reasoning skills using a modified Bayesian approach. The literature suggests that faculty can teach clinical reasoning early in medical education by making the process explicit to the student[2]. We modified a Bayesian model where students are provided with a case that unfolds as they uncover various aspects of the patient's history, physical exam and laboratory data findings[3]. The approach is "modified" in that a true mathematical Bayesian analysis of the data is not performed. Rather, students are asked to commit to their top 5 diagnoses and attribute percentages of likelihood for each diagnosis, or simply rank their top 5 diagnoses in order of likelihood from 1 to 5. After each step of the case discussion, students adjust the likelihood of their diagnoses and eventually arrive at a final diagnosis. We evaluated the outcomes of a faculty development session with clinician educators who facilitated small-group, case-based workshops for second year medical students. Faculty members participated in a program that consisted of one 90-minute training workshop, the opportunity to have one small-group teaching session filmed for self-assessment, and feedback on their instruction with an educator. We interviewed participants before and after the module regarding their perceptions on teaching clinical reasoning and solicited feedback from the students about the effectiveness of being taught the method.

Lessons Learned: We found that: Designing and implementing a course-specific faculty development program prepared the faculty for teaching clinical reasoning, The faculty development program encouraged the clinician educators to implement the Bayesian method using their own facilitation techniques, Faculty and students alike considered the modified Bayesian approach useful for fostering clinical reasoning skill development, Both faculty and students appreciated the unfolding nature of the approach, A teaching challenge faced by the faculty was guiding the students to focus on narrowing the differential diagnosis to the five most likely as the case unfolded, and Novice medical students can acquire knowledge while developing clinical reasoning skills.

Significance: Our work directly impacts teaching and learning in medicine by providing a faculty development program model that can be feasibly implemented across medical schools. While our program tailored to the specific needs of faculty who teach within a particular course context, it can be modified to prepare faculty to teach clinical reasoning in courses of other specialties.

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Short Communication 47: Tracking Clinical Skills Progress: Teaching Decisions, Dashboards, and Self-Regulated Learning S. Yingling, S. Paul, R. Crowe New York University School of Medicine

Purpose/Problem Statement: Evidence-based decision-making in medical education requires ongoing collection, analysis and display of data generated at multiple levels: requirements defined by the institution, learning objectives defined by educators, and learning outcomes generated by students. We applied the principles of self-regulated learning (Artino and Jones, 2013) to the design of dashboards that track the acquisition of clinical skills in the pre-clerkship phase, with specific attention to OSCE performance. The design team is multi-disciplinary in nature, comprising institutional leadership, module directors and educators, data scientists, and learners. In addition, the dashboard design team must focus at multiple levels: the mission and educational impact level, the data architecture level, and the analytics and visualization effectiveness level. We approached the complexity of this task by using the technique of a structured collaborative dialogue, starting with the need for a dynamic teaching dashboard that provides ongoing access to key measures of student progress.

Methods/Approach: NYU School of Medicine's 18-month-long core clinical skills teaching module, the Practice of Medicine (POM), includes seven comprehensive objective structured clinical examinations (OSCEs). The POM Director designed the module to provide students with numerous opportunities for preparation, deliberate practice, and formative feedback. All learners must meet clinical skills performance expectations before transitioning to core clerkships. In order to continuously monitor and update individual-targeted and class-wide teaching strategies in real time and to give individual students feedback and opportunities for reflection and practice, a "teaching dashboard" is a necessity. We describe the manual tracking method initially devised by the module director and the ways in which it met her decision-making needs. We then describe the dialogue in which the POM Director and the design team developed a shared understanding of a dynamic dashboard that would meet her needs to assess the effectiveness of the module's teaching, both for individual students and cohorts of students, and also to identify trends over time in students' development of core clinical skills.

Results/Lessons learned: Employing the collaborative dialogue technique ensured that insights from the module director drove our design process for the teaching dashboard. The resulting analytics and visualizations reflected the meaningful differences defined by the educator that are now automatically updated and easily accessed. The dialogue also ensured that the student-facing dashboard reflected the important self-regulated learning principles that underpin the cyclical, iterative nature of clinical skills acquisition. The student-facing dashboard reinforces three-phase learning: preparation for active engagement in a learning event, capturing performance information about the event, and then making learner-driven plans based on the feedback from the event (Corrin and deBarba, 2014).

Discussions and conclusions/Significance: With our increased ability to easily create visualizations of data comes an increased responsibility to ensure that such visualizations truly provide value and serve as decision-making tools (Few, 2006). Ensuring that principles of medical education are incorporated into dashboards and other presentations of data requires not only understanding the "user" perspective – whether educator or learner – but requires that dashboards are used as demonstrations of learning as an active, deliberate, decision-making process.

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Short Communication 48: Standardized Patient- Instructor and Senior Medical Student Teams: A Novel Way to Teach the Physical Examination to Novice Medical Students

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Purpose/Problem Statement: To assess whether using non-physicans to teach physical diagnosis skills to novice medical students affects their OSCE performance
Methods/Approach: Faculty have traditionally taught PE skills to novice medical students. In recent years, recruting busy faculty to accept this responsibility has been difficult. In addition, faculty have their own way of teaching specific skills, making consistency of the curriculum a problem Reports have documented the effectiveness of using either standardized patient-instructors (SPIs) or senior medical students (MS4s) to teach physical examination (PE) to novice medical students (MS1s). Postulating that the roles of SPIs and MS4s could be complimentary, we implemented a novel PE curriculum using SPI-MS4 teams to teach PE to MS1s.
Results/Lessons learned: MS4s prepared for their teaching role in this course by particpating in a long-standing senior elective called TALKS (Teaching and Learning Knowledge and Skills), which includes interactive workshops such as adult learning principles, teaching a skill, and giving feedback. SPIs learn the mechanics of key physical exam maneuvers in a parallel course. MS4s and SPIs then participated in a teamwork training workshop focusing on working together effectively. Faculty have assumed responsibility for teaching PE skills prior to 2010 and since that time, SPI-MS4 teams have taught MS1s.. To evaluate program effectiveness, MS1 performance on Fall and Spring objective structured clinical exams (OSCEs) was assessed before and after the transition from faculty teachers to SPI-MS4 teams.
Discussions and conclusions/Significance: Pooled Spring and Fall OSCE results from 2006-2009 (Table 1) were compared to pooled results from 2011-2014 (Table 2).The 2010 year was considered a transition one by the authors to account for a new program. Spring OSCE results of the MS1s showed the mean scores increased by 8.2 points (p value < 0.001).
Reflection: What we achieved with this innovation included: 1) a standardized way of teaching PE skills to novice medical students, 2) an effective collaboration between MS4s and SPIs. 3) a teaching laboratory for MS4s to apply their teaching skills to near peers as part of their TALKS course, and 4) an actual increase in MS! performance on Spring OSCE exams. We attributed the MS1 Fall scores to the dyad's getting acclimated to their teaching responsibilites, having taught together for a brief period of time.
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Short Communication 49: "Are Lecturers Teaching You What They Think They Are Teaching?"

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Purpose/Problem Statement: One of the LCME standards requires that a medical curriculum cover "lists of subjects widely recognized as important components of the general professional education of a physician" (LCME 2013). Course leaders design curricula in good faith using content expertise and available local and national resources. They tag lectures with keywords to detail the content within and across courses for a school-wide curriculum database. Yet, we cannot be certain that what students take away from a lecture is what the faculty intend, and students sometimes ask faculty to clarify 'what is most important' in a session. Traditional methods of evaluation such as examinations are limited in their capacity to ascertain the scope and specificity of instruction. Though they measure student knowledge, this can be derived from both lecture and other resources. At the University of Massachusetts School of Medicine (UMMS) we are piloting an innovative approach to real-time assessment of how well faculty objectives meet what students garner from a lecture.

Methods/Approach: All students in the first year Principles of Pharmacology class (n=125) were invited to complete a simple keyword survey using Google Forms following each lecture. With the majority participating, students enter up to 10 relevant free-text keywords for 26 lectures. We will compare students' keywords to those of faculty to assess the effectiveness of course content delivery with respect to agreement regarding key topics covered. Data are assessed using the R Project for Statistical Computing platform and manipulated through custom scripts that compare student to lecturer keywords and calculate summary statistics. The frequency of instructor-specified keywords are plotted, along with the most frequent non-instructor-specified keywords identified by the students. Summary statistics are calculated per lecture, within instructors' sets of lectures, and between instructors.

Results/Lessons learned: Preliminary analysis of the first five lectures demonstrates high student participation (min=77, max=102, of n=125 students). The set of 10 faculty keywords per lecture were then assessed for the mean (i.e. average of the response rate across the 10 keywords), the keyword with the min response rate, and the keyword with the max response rate. Lecture 1: mean 10.8%, min 0%, max: 42.3% Lecture 2: mean 16.1%, min 0%, max: 41.2% Lecture 3: mean 16.7%, min 0%, max 73.4% Lecture 4: mean 27.0%, min 1.19%, max 78.6% Lecture 5: mean 31.8%, min 0%, max 70.1% The values are expected to be higher following further data processing, due to variations in keyword spelling among student survey submissions that have not yet been merged. The lecture data will also be grouped by specific instructors to determine overall statistics.

Discussions and conclusions/Significance: Limitations include variations in the spelling of student keywords, which initially appear as distinct from faculty keywords, yet have the same intent. These keywords also do not indicate depth of knowledge communicated to the students at the appropriate level. Though these are a few of the potential limitations of the pilot project, further iterations will refine keywords and provide feedback to faculty to enhance instruction. It is our goal for this project to help faculty identify where student learning aligns with and differs from lecture objectives, consider how student-generated keywords may enhance our curriculum database, and demonstrate how faculty and students may utilize data science fundamentals for curriculum development and scholarship.

Reflection: I appreciate the opportunity to participate in medical education. It was informative to work closely with faculty and to also forge connections with underclassmen. Designing and

executing the project was not without its challenges, but the prospect of contributing to medical education for the next generation of our students at our program made it a worthy endeavor.
References: Liaison Committee on Medical Education (LCME). Functions and Structure of a Medical School. June 2013.

Short Communication 50: In Each Other We Trust? The Presence and Valuation of Study Advice from Peers and Faculty among Medical Students in One Medical School

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Rutgers Robert Wood Johnson Medical School

Purpose/Problem Statement: To examine the sources and perceived helpfulness of course specific study advice received by first year medical students in order to better understand how peers and faculty influence self-regulated learning behaviors. Soliciting advice can be a form of academic help-seeking which is itself a manifestation of self-regulated learning (Karabenick & Newman, 2006). Ideally, students must consider if they need study advice, determine where they should seek it out, critically evaluate the advice received, choose how to act, and then reflect on the outcomes of those actions--all major components of self-regulated learning. Students can seek either informal (e.g., peers) or formal (e.g., faculty) help from those who understand their situation and offer assistance (Newman, 2012). Medical education research has examined how perceptions of the learning environment are associated with self-regulated learning behaviors (Artino et al., 2012). However, there is little known about which sources medical school students receive advice from and how useful those sources of advice are. In the present study, we examine the source and perceived helpfulness of study advice received by first year medical students.
Methods/Approach: During the academic year 2014-2015, first year students (M1) were invited to complete an online survey at the end of each course (7 times) to indicate sources of study advice received-- M1 or M2 students (including peer mentors), course faculty, academic support faculty-- and to rate how helpful that advice was on a 5-point Likert scale (1=not at all helpful; 5 = extremely helpful). In addition, students were asked to indicate what advice they found least helpful, what advice they would offer to next year's students, and comment on their approach to learning within that course.
Results/Lessons learned: Response rates ranged by course from 57-70%. Students reported receiving advice from M1s (an average of 78% of the time throughout the year), M2s (71%), course faculty (71%), and academic support faculty (34%). Students reported most consistently receiving study advice from their M1 student peers and from academic support faculty least often; however M1 peer advice was reported as least helpful (3.04 average), while academic support faculty were rated consistently as the most helpful (3.63 average). Student comments indicated that not all advice received is followed, particularly from their peers. Student responses revealed three kinds of advice that were not helpful: (a) a directive to use a particular resource, (b) what should or should not be prioritized or deemphasized in studying, and (c) advice about lecture attendance. Much like the advice they cited as least helpful, when asked what advice they would give to next year's M1 students, they responded with directives to get particular resources and with specific instructions about prioritizing and ignoring specific topics.
Discussions and conclusions/Significance: First year students received study advice from their M1 peers most often which supports earlier research that informal sources of help may be used more than formal sources (Karabenick, 2004), but as this study suggests, the most frequently received advice may not be the best. We found that advice received is often not solicited, which may be a particular feature of the medical school context. Future research should explore the perceived helpfulness of solicited and unsolicited formal and informal advice, considering that the literature focuses solely on advice that is sought, overlooking advice that is

received but unsolicited. In addition, given the mixed advice that students received and distributed to one another, it is important that students are encouraged to critically monitor and evaluate sources of advice, and that faculty help sustain an environment conducive to this critical element of self-regulated learning.
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Short Communication 51: Mathematical Models to Predict Medical School Licensure Scores from Academic Indicators

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Purpose/Problem Statement: We aimed to identify academic indicators that predict scores on the Step 2 CK licensure exam to identify students in need of academic support.
Methods/Approach: The ability to identify students at risk of experiencing difficulty completing curricular requirements is crucial to educational assessment. Our students must demonstrate competency in locally designed preclinical exams during years one and two, National Board of Medical Examiner subject exams targeting clerkship content during year three, and United States Medical Licensing Examinations Step 1 and Step 2 Clinical Knowledge (CK) after the preclinical and clerkship curriculum, respectively. We aimed to identify academic indicators that predict scores on the Step 2 CK licensure exam to identify students in need of academic support. Previous research (Donnon et al., 2007) suggests MCAT score is predictive of licensure exam performance, though no known research has investigated the predictive power of scores on exams completed during medical school
Results/Lessons learned: We analyzed data for medical students (n=218) with complete preclinical exam, subject exam, Step 1, and Step 2 CK scores.
Discussions and conclusions/Significance: The first model used data obtained prior to year three. Preclinical exam score and Step 1 predicted 56% of the variance in Step 2 CK (R^2=.56,$F(3,216)$=136.82,$p<.001$). Preclinical (B=.17,t=3.11,p=.002) and Step 1 were both significant (B=.64,t=11.52,$p<.001$). Additional models incorporated subject exams from three of six clerkship rotations. Preclinical exams, Step 1, and three subject exams were entered into a series of regressions to test sequences of clerkships. The series of models significantly predicted 67–69% of the variance in Step 2 CK (R^2=.69,$F(3,215)$=169.50,$p<.001$;R^2=.67,$F(3,215)$=144.92,$p<.001$). Step 1 (B=.27-.28,t=4.27-4.79,$p<.001$) and subject exams (B=.54-.56,t=8.46–9.72,$p<.001$) were predictors of Step 2 CK across analysesReflection: Our data were limited to one medical school and we encourage replication. We suggest using the first model as a needs assessment to gauge the level of future support required and re-screening after three of six clerkships to identify which students to provide support
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Short Communication 52: "Pharmacology Jeopardy": A Practical Application of Gamification Theory to Enhance Medical Education

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Purpose/Problem Statement: Our goals were to: 1) create a virtual medical jeopardy game to serve as a supplement within the traditional cardiology curriculum that applied classroom pharmacology concepts to clinical scenarios, and 2) to evaluate satisfaction and retention of the cardiology pharmacology material in a post-examination survey.
Methods/Approach: Historically, pharmacology is a challenging component of preclinical medical education for two primary reasons – first, the information is discrete, detailed, and high-volume; second, information is often tied to clinical cases before students are exposed to patient care on the wards1. Meanwhile, the use of jeopardy as a tool in medical education is a growing trend in curricula across the country, with demonstrated benefits to student retention and satisfaction2. To evaluate these outcomes, we developed an online jeopardy-based supplement to the second-year cardiology pharmacology curriculum at the Alpert Medical School.
Results/Lessons learned: The game was designed and reviewed by a team of three physicians and two third-year medical students using material from the curriculum, reference textbooks, and USMLE review resources. Eighty pharmacology questions were organized into five broad disease categories that focused on the clinical application of pharmacology knowledge, and were divided into three gameboards. The game was delivered through an online platform that allowed students to play as individual users or in small, self-appointed teams according to their preferences.
Reflection: While the use of medical jeopardy in residency programs has been well-studied3, there have been relatively few studies aimed at evaluating the use of jeopardy in medical school. This work contributes to our understanding of how popular memory games such as jeopardy, particularly in a self-directed online format, can be utilized effectively to improve instruction in a difficult avenue of preclinical medical education.
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Short Communication 53: Guiding Assessment of Interprofessional Collaborative Practice in Medical Students: A Delphi Study

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Purpose/Problem Statement: In the context of changes to healthcare delivery and initiatives to enhance patient safety and quality of care, healthcare policy and education institutions have placed a renewed emphasis on the importance of competency domains relating to interprofessional collaborative practice (ICP).1 Although consensus surrounding the need for ICP in health professions education has resulted in the development of 38 competency expectations across four general domains2, methodologies and frameworks to assess these competencies in undergraduate medical education (UME) remain lacking. Thus, the purpose of the present study was to establish consensus on those competencies that should be expected in graduating medical students, which in turn, could help inform the development and guidance of assessment efforts along the UME continuum.

Methods/Approach: A modified Delphi technique was used to facilitate consensus amongst an interdisciplinary panel of informed experts regarding the Core Competencies for Interprofessional Collaboration (IPEC) that should be expected and assessed in graduating US medical students. The Delphi process for this study involved the administration of a 38-item Delphi questionnaire that was organized by the following four IPEC competency domains: 'values/ethics for interprofessional practice'; 'roles/responsibilities'; 'interprofessional communication', and; 'teams and teamwork'. All items were rated on a dichotomous (essential/non-essential) scale. Responses from each round were reviewed and items that did not reach an a priori consensus threshold of approximately 85% were dropped from subsequent iterations of the Delphi questionnaire. The Delphi process was terminated once responses displayed stability and consensus was established among the panel. The panel then discussed the results of the Delphi process with the goal of mapping them to existing ICP assessment tools within the literature.
Results/Lessons learned: At the completion of three rounds, the results of the Delphi process revealed that 9 of the original 38 IPEC competencies were considered essential to graduating US medical students. Specific to the four IPEC competency domains, the greatest rates of agreement among panel members related to competencies within the 'values/ethics for interprofessional practice' domain, as six of the original ten competencies remained at the conclusion of the third round. Although the domain of 'interprofessional communication' received relatively less agreement regarding essential competencies, a quarter of its original competencies remained at the conclusion of the third round. One competency in the 'roles/responsibilities' domain was retained. The competency domain pertaining to 'teams and teamwork' was the only domain that did not have a competency remaining at the end of the Delphi process.
Discussions and conclusions/Significance: The present study demonstrated the feasibility of utilizing a Delphi process to guide the targeted assessment of ICP in UME. Simultaneously, the study revealed challenges in using the IPEC consensus document as the basis for an assessment tool. Specifically, panel members voiced concern about the difficulty in distinguishing and measuring the competencies independently of one another. Nevertheless, by prioritizing competencies for assessment, this process subsequently led to the identification and modification of an existing ICP assessment tool3 that was successfully implemented in the second and third year curriculum at our institution. Work is ongoing to determine the tool's validity and overall effectiveness in assessing ICP in our trainees. Future work is needed to determine whether the results of the Delphi process extend to other institutions.
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Short Communication 54: Introducing the Essentials of Procedural Skills: A Preclinical Course for Medical Students

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Purpose/Problem Statement: 1. Define the baseline procedural confidence of medical students at the Alpert Medical School of Brown University (AMS) 2. Develop an 10-week introductory preclinical procedural skills course for first and second year medical students 3.

Assess the perceived change in competence and confidence of students who participated in the elective

Methods/Approach: Procedural competency is essential for all physicians in training, from medical students to residents. Recent studies, however, suggest that an alarming number of graduating medical students are not competent in a number of key procedures. 1, 2 This stands in stark contrast to the release of the Core Entrustable Professional Activities (EPAs) by the AAMC which state that graduates should demonstrate procedural competency in various procedures including venipuncture, suturing, and splinting. Earlier procedural training has been shown to motivate learners to practice skills independently and may lead to improved self-perceived confidence. 3 Unfortunately, medical school curricula have not kept pace with the need for earlier training, especially in the traditional preclinical years. Given this gap, we propose a 10-week extracurricular elective for first and second year medical students to provide a procedural skills foundation prior to the clinical clerkships.

Results/Lessons learned: Over a period of 3 months, medical students at AMS were surveyed to establish baseline procedural confidence levels at different stages of training. Using this data, as well as survey results from institutional program directors' perspectives on what constitutes a prepared intern, an extracurricular 10-week course known as a preclinical elective was created based on a list of key procedures from our needs assessment including suturing, lumbar puncture, splinting, venipuncture, arterial blood gas, ultrasound, sterile technique, bag-valve mask ventilation, and intubation. Fifteen students participated in the first iteration of this course which consisted of weekly, 2-hour didactic sessions with approximately 1 hour of preparation required before class. A flipped classroom model was utilized for the didactic sessions where students were required to review videos and readings prior to each class. All sessions began with a brief review of the procedure including consent, risks, benefits, indications, contraindications, and steps in the procedure, followed by hands-on practice time. Each session aimed for a student:faculty ratio not exceeding 4:1. At the end of the elective, students were required to complete both a multiple-choice exam for knowledge retention and 4-station practical exam to demonstrate procedural competency; students were also queried for levels of confidence pre- and post-course.

Discussions and conclusions/Significance: Procedural training during the first and second years of medical school is feasible with a small cohort of learners. We found that the elective is better suited to students who have completed anatomy since anatomic landmarks are a critical piece of information to understanding many of the common procedural techniques. We also found that the success of each procedural training session was directly related to the amount of hands-on practice provided to the students. The flipped classroom model proved to be an effective strategy by minimizing large group lecture and optimizing hands-on, mentored practice with resident and faculty preceptors. We also found that peer-to-peer teaching was an effective way for students to demonstrate their understanding of the skills presented. One major consideration when planning such a course is securing necessary resources. While the pilot study only involved 15 students, obtaining essential materials such as manikins, suture and splinting materials, sharps containers, and gowns/gloves required for each session took up to 50% of the required preparation each week. The other 50% of the work load involved preparing didactic content and obtaining preceptors. We found that low fidelity simulation, when combined with appropriate clinical context, was well-received by students and is a great alternative when higher-fidelity simulation models are unavailable. Additional limitations include the absence of a longitudinal follow-up and the connection between learner self-perceived confidence and actual competence. Future studies may be directed towards assessing the long-term retention of procedural knowledge and skills obtained during the preclinical years.

Reflection: Students showed an increase in perceived confidence in all procedures taught during the elective (all $p<0.0001$). Overall, students noted that the course was a welcome addition to the standard curriculum and allowed for ample hands-on, mentored practice time.

This course may serve as a model for other institutions looking to expose preclinical medical students to key procedural skills early in their training. Such a course may have implications for longitudinal tracking of procedural skills and provide educators with a way of assessing the procedural skills component of the EPAs.
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Short Communication 55: Teaching Intimate Partner Violence (IPV) Screening and Counseling to Medical Students Using the Motivational Interviewing (MI) Framework

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Purpose/Problem Statement: IPV is an important public health concern that affects a significant portion of the population. In the US, it is estimated that 25% of women and 7.6% of men experience IPV during their lifetimes1. Despite the prevalence and clinical relevance of IPV, most medical schools lack formal training curricula that teach learners how to screen and counsel for IPV. Knowing that medical students will encounter patients with IPV in their training and over the course of their careers, it is imperative that we provide them with the tools to address this critical issue early in training2.
Methods/Approach: We developed a curriculum for 2nd year medical students as part of their required clinical skills training course known as Doctoring. The curriculum focuses on screening and counseling for IPV using the well-established framework known as motivational interviewing (MI) 3. We have utilized MI as a framework to teach and assess other core clinical skills such as smoking cessation. We created a checklist using the 5 A's of MI—ask, assess, advise, assist, arrange—as a teaching tool to guide students through such patient encounters. The checklist utilizes the "HITS" screening tool and provides suggestions for counseling patients at varying stages of readiness to change1, 3. The first part of the curriculum was a standard session as part of our Doctoring program on Thursday afternoons from 1-4pm. Students were provided with required IPV reading materials prior to class including a 20-minute lecture and 2 review articles. The session began with a 1-hour panel led by healthcare advocates in the field including a physician and 2 social workers. This was followed by a 1-hour practice session in small groups with a social-behavioral-science (SBS) faculty member and 3-4 students. Each student interviewed the SBS faculty member using the IPV checklist as a guide; each student was given a different IPV case. SBS faculty and peers then provided feedback on the encounter. The second part of the curriculum involved a subsequent Thursday afternoon session where students, in groups of 8, worked with a standardized patient (SP) to practice IPV screening and counseling for 1 hour. This session was facilitated by a SBS and physician faculty pair. This was followed by an additional 1-hour practice session in small groups of 3-4 students with SBS faculty. For each of these sessions, students were provided with a handout of local IPV resources including an example of a safety planning worksheet. The final component of the curriculum was a 20-minute objective structured clinical encounter (OSCE) station as part of the overall Doctoring course. A grading rubric was created for SPs to grade students in a case that focused specifically on IPV counseling and screening.

Results/Lessons learned: In prior iterations of this curriculum, students were only taught to screen for IPV without any attention paid to the importance of following-up screening questions with appropriate counseling. Based on student and faculty feedback, we believe that a successful IPV curriculum should provide students with both components. MI provided a natural framework for this approach but caries the risk of making IPV counseling appear protocolized and "one-size fits all". It is imperative that this clarification be made early to students—a checklist for IPV screening and counseling is meant as a teaching tool to learn the techniques, not as a script. Finally, we found that evaluating learners using an OSCE gave weight to the subject matter and allowed students to demonstrate necessary clinical skills in addition to knowledge and attitudes which are discussed in small group sessions.
Discussions and conclusions/Significance: IPV is a prevalent concern with important impacts on health. Teaching medical students to screen and counsel for IPV may have an important long-term impact on our healthcare system's approach to IPV. This program offers other academic institutions a model for teaching and evaluating IPV screening and counseling skills using MI techniques, which may have crossover into other arenas of clinical skills training as well.
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Short Communication 56: Day One of Medical School: Welcome to Evidence Based Professional Identity Formation

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Purpose/Problem Statement: The Carnegie Foundation recommends that medical education use an evidence-based approach to understanding the formation of an ethical professional identity (Irby, 2010). Professional identity formation involves: (1) increasingly complex mental processes (2) cognitive development in parallel to social-emotional development (3) increasing level of mental complexity that shapes our views of ourselves and others (4) maturation from being externally defined to being internally defined. While these tenets are understood and applied by educators, theory-based measurement of them is rare. To make explicit the expectations of professional identity development during medical school and beyond, medical students need a clear conceptual framework as well as data about their own development over time.
Methods/Approach: We introduced the Professional Identity Essay (PIE; Monson, 2011) to incoming medical students. Based on work by Kegan, the PIE measures four broad stages in adults' thinking about themselves and their professional role development: Instrumental, Socialized, Self-Authored and Self-Transformational. The PIE has been extensively studied in dental and law students. Our unique exploration of the feasibility of measuring professional identity formation during the education of physicians also includes a comparison to an established measure of moral reasoning, the Defining Issues Test (DIT; Bebeau, 2002). An entire entering class of medical students was introduced to our professionalism curriculum during orientation. They then completed both the PIE, comprising six brief essay responses to prompts, and the DIT, which is a case-based, highly-validated quantitative measure of students' ability to apply moral principles in solving complex moral problems. Expert scoring of all PIEs was conducted by a lifespan developmental educational psychologist. Each student received a

stage score that was on the Instrumental, Socialized, Self-Authored and Self-Transformational continuum and also received individualized feedback based on the student's PIE writing. DITs were scored by the Center for the Study of Ethical Development at the University of Alabama, providing metrics of each student's capacity to reason from ethical principles. Students received a detailed feedback report that explained the significance of their scores on both the PIE and DIT measures and provided them with additional resources in their electronic Student Academic Portfolios. We then led a facilitated group discussion and engaged students in a structured reflective writing exercise about professional identity formation and the feedback they had received. As a group, students' average DIT scores reflected a higher level of ethical reasoning than is typical of the general population. The students' PIE scores were distributed across stages, with many in the Socialized and Self-Authored stages. These data are currently being analyzed.

Results/Lessons learned: Medical students were intrigued by the personalized feedback on their stage of professional identity development. The introduction of this explicit framework to entering students provides an ongoing point of reference as their training unfolds. The PIE was well-accepted by students particularly within a guided discussion of Kegan's developmental stages. Students wrote thoughtful reflections about the meaning of the data they received, described the personalized feedback and the overall framework as helpful, and expressed great curiosity and positive anticipation about how their PIE results will look at key points in their future.

Discussions and conclusions/Significance: This marks the first time that the PIE served as the basis for introducing professional identity formation to a cohort of medical students. We plan to engage students in further discussions of professional identity development with updated PIE scoring as they advance in training. We will examine the relationships among PIE scores, DIT scores, MMIs used in admissions, and measures of clinical skills reflecting readiness to take on responsibility for patient care.

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Short Communication 57: Teaching Quality Improvement and Patient Safety to Preclinical Medical Students: A Framework for Early Introduction

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Purpose/Problem Statement: Quality improvement and patient safety (QI/PS) are becoming central to the future success of clinical medicine1. Medical schools and organizations such as the National Board of Medical Examiners (NBME) are recognizing the importance that individuals at all levels of healthcare play in understanding and enacting QI/PS. Some schools have initiated programs to teach QI/PS essentials to medical students with positive results, though there are significant differences in how such curricula are taught 2, 3. Though various resources already exist, such as Institute for Healthcare Improvement (IHI) Open School modules, integrating QI/PS seamlessly into existing curricula is often difficult. We describe our approach to developing and integrating a rapid introduction to QI/PS principles for preclinical medical students.

Methods/Approach: We developed a rapid introduction to QI/PS session for 2nd year medical students as part of a required clinical skills training course known as Doctoring. In deciding how to incorporate the introduction, we chose a topic that was already being discussed in the course (medical errors) as a vessel for introducing QI/PS. The goals of the 1-hour session were to: 1) be sure all student understand how to disclose medical errors and why it is important for patient safety, 2) define patient safety and discuss what role medical students play, and 3) discuss the basics of quality improvement and implement a basic root-cause-analysis (RCA) and plan-do-study-act (PDSA) cycle. We used a flipped-classroom model for this session. Learners were required to read an overview of QI/PS and watch a 10-minute video prior to class. The session was led by a social-behavioral-science (SBS) and physician faculty co-pair and each group had 7-8 students. Students were first introduced to a medical errors case and discussed the principles of appropriate disclosure. The case also provided various outcomes for discussion so that learners could understand the different perspectives of various providers on the healthcare team. Facilitators then transitioned from the patient-level to the systems-level using QI/PS principles. Students were asked to fill-out a fishbone diagram identifying some of the possible scenarios that led to this medical error. Using this information, students were then guided to develop an aim statement and measures for a proposed PDSA change project to address the error. Prior to the session, a 1-hour faculty development session was held to train all 34 SBS and physician faculty to ensure consistency across small groups. Concerning evaluation of the curriculum, we queried students pre- and post-session to evaluate their attitudes and self-perceived satisfaction with the topic.

Results/Lessons learned: QI/PS are important topics in the preclinical curriculum despite the limited time that medical schools have to introduce new topics. One potential key to success is connecting such topics to already existing curricular components so that the integration is less choppy. We found that faculty development on this topic was also critical to success as not all faculty had a clear understanding of the principles that would be used. After the session, feedback from faculty and students revealed that more time is necessary to explore such cases beyond the 1 hour that was provided. Given that it was a very hands-on session, students needed more time to develop the fishbone and PDSA diagrams and understand how they could test a change in the clinical environment.

Discussions and conclusions/Significance: QI/PS is increasing in prominence in medicine and must become an integral part of medical education as system change can affect patient outcomes in the clinical environment where medical students play a key role. It is important that students feel empowered to initiate and test a change and at a minimum, understand where the process starts before they enter the clinical arena. Given the increase focus on QI/PS in clinical training, other institutions may find this curriculum helpful as an introduction for students prior to the traditional clerkship years.

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Short Communication 58: Simulating Internship: Creating a Simulation Curriculum to Prepare Fourth Year Medical Students for Internship

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Learning Objectives: 1) Describe the utility of simulation in effectively teaching and reinforcing the Core Entrustable Professional Activities for entering residency 2) Create a sample framework for a transition to internship training curricula focused on: (a) Competencies identified as highly import for interns in the learners' intended specialty; (b) Employing appropriate and varied simulation methods (i.e. standardized patients, high-fidelity mannequins, task trainers, etc.)

Methods/Approach: The transition from medical school to internship, regardless of specialty, can be challenging. In addition, the fourth year of medical school varies greatly in clinical exposure between institutions. A survey of Internal Medicine program directors determined the competencies expected of beginning interns. These expectations were mostly focused on communication, organization, time management, and basic clinical skill as well as knowing when to ask for help.1 With the shift towards competency-based education and the description of the Core Entrustable Activities for Entering Residency, ensuring medical school graduates are prepared for the transition to internship is increasingly important as the necessary skills are better defined.2 In response to this need for more directed preparation, many medical schools have created 'boot camps' or 'transition to internship' curricula for varied specialties. These programs vary greatly across institutions and disciplines, with some focusing on clinical or procedural skills and others focusing more on communication and teamwork. Determining the most effective educational strategy for imparting these skills in a classroom setting remains a challenge. Simulation is an effective method for teaching both clinical and communication skills within medicine. Studies suggest that simulation-based education with deliberate practice is superior to traditional teaching methods in medicine.3 At the Perelman School of Medicine at the University of Pennsylvania (PSOM); we created a transition to internship curriculum that included a 4-hour simulation of "The Day in the Life of an Intern." This simulation was nested in a two-day course comprised of small-group and didactic content focusing on honing the skills necessary for a successful transition from student to resident. This workshop aims to describe this educational strategy and allow participants the opportunity to better understand and how to utilize simulation in their institution's transition to internship curriculum.

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Short Communication 59: Medical Students Offering Maternal Support (MOMS): Lessons Learned from a Pilot Study

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Purpose/Problem Statement: Limited opportunities exist for medical students to be involved in longitudinal patient care and work with underserved populations. At the same time, infant

mortality and low birth weights in the United States illustrate persistent racial and ethnic disparities.1 Other interventions have shown that at-risk pregnant women may benefit from additional support from resources such as community health workers and health coaches.2 Given their status as educated, renewable human resources, deploying medical students as community partners, similar to the international community health worker model, can serve to enhance the student experience while addressing health disparities facing pregnant women.
Methods/Approach: In November 2014, four first-year students at Harvard Medical School were selected and paired with pregnant women at the Bowdoin Street Health Center (BSHC). Students were matched with patients identified by the BSHC OB/GYN team as individuals who could benefit from additional support. The program was designed for students to attend prenatal appointments, the delivery, and early pediatric visits over the course of eight months. Students also participated in eight monthly didactic sessions led by obstetricians, social workers, doulas, and senior students on topics related to pregnancy, patient support, and community resources. Following the pilot phase, the MOMS team conducted individual interviews and focus groups with students to assess their experiences and solicit feedback. This qualitative evaluation provided valuable insight into the student experience and ways the program can be improved.
Results/Lessons learned: In the program evaluation, students noted that the MOMS time commitment was reasonable given their first-year course load. However, they stressed the importance of proximity to the CHC and reimbursements for transportation. Students cited the didactic sessions as complementing their medical school courses by providing the opportunity for in-depth study of pregnancy, which was directly applicable to patient visits and interactions. Students experienced challenges related to communicating with patients. Several recommended allowing students to access appointment times without having to go through their partners. From this feedback, MOMS learned two important lessons: 1. Early matching of students with patients is key to the success of the program: Students need to be connected with patients as early as possible. Early connections provide the opportunity for students and their patients to build strong relationships that last throughout the experience. Long-term patient interaction is the main selling point of the program and an expectation among participants. 2. Students need a platform for communication with partners: In the pilot, students were dependent on their partners to notify them about appointments and delivery; several students had difficulty obtaining this information from their partners and as a result missed opportunities for interaction.
Discussions and conclusions/Significance: MOMS has the potential to fill important gaps in medical education and was valued as a meaningful educational experience by students. More research is needed as to the impact on patients and the ability to positively affect patient health outcomes. During the 2015/16 academic year, MOMS has expanded to 13 student-patient pairs. The hope is that this program will not only continue to grow at Harvard Medical School, but will also become a model that can be adopted at medical schools around the country.
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Short Communication 60: NeuroWorkbooks: A Different Way to Support Interactive Classroom Learning

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Purpose/Problem Statement: Currently medical educators are exploring different ways to turn traditional lectures into shared, interactive experiences that engage students and enhance learning [1]. One approach is the "flipped classroom," in which the primary delivery and learning of core content occurs during before-class activities, while interactive in-class sessions provide opportunities for deeper understanding and application of content to problem solving. While their features may differ, the success of this and other methods designed to create more interactive classrooms critically depends on students' before-class learning. The format and content of assigned before-class materials both likely matter [2]. Much has been written recently on use of various video formats [3]. However this is not the only or necessarily the best way to promote and support before-class student learning. We have therefore explored a different approach based on interactive Workbooks.

Methods/Approach: Two pilot NeuroWorkbooks were created in Adobe Acrobat Professional. They introduce first-year medical students to the nervous system and its cells, and some of the structural specializations that adapt these cells to their respective functions. The Workbooks are 17-18 illustration-filled pages. Each is the before-class assignment for a large group session that utilizes a mixture of interactive and passive teaching strategies depending on both specific content and students' in-class responses. The Workbooks contain images and text that are tagged with interactive drawings and questions that guide student learning by providing key information, explaining why it is important, and integrating structure with function. They are designed to provide a framework into which students can subsequently integrate additional information. Using them, students can study content, use their mouse to interact with images and text, quiz themselves and get feedback when they choose, add and save personal notes, and view basic or advanced material.

Results/Lessons learned: Over the past four years many students have rated these before-class Workbook assignments as "excellent" and described them as well organized and integrated with the large-group session. In their comments, students have noted, "The NeuroWorkbooks were dynamic and interactive." "Pre-class work like this that continuously tests your knowledge of what you're learning is very helpful." "This was the best, most helpful preparation for class." Faculty note that students' many responses to in-class questions such as, What are some challenges of being a neuron? enriched related classroom discussions and supported learning. In the past three years, the mean score on 6 exam questions that required application of Workbook-related content was 95.3% (range of means 89.3-99.3%; n = 382 students). The NeuroWorkbooks provide guidance, but each student determines just how they will utilize them. Some students may use the intercalated questions and feedback for initial learning, while others use them as a later check-up on their learning. Current versions of the Workbooks do not include auditory or visual animation. However, unlike a video format, students can annotate and save their PDF-based workbooks for future reference, and can interact directly with the material as they learn.

Discussions and conclusions/Significance: These outcomes suggest that the interactive NeuroWorkbooks help students acquire and organize basic information, thus providing a framework that supports further in-class learning. One reason for their success may be that while the teacher identifies what is to be learned, each student controls the pace and order of learning. Initial positive responses have encouraged us to develop additional NeuroWorkbooks on the spinal cord and the cranial nerves. The choice of appropriate formats for before-class learning likely depends on both the setting and content area. The workbook approach may be especially helpful for image-based material.

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Short Communication 61: Cranial Pursuit© Computer-Based Neuroanatomy Games to Supplement Traditional Lectures: A Pilot Study on Learning Outcomes and Attitudes in First Year Medical Students

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Purpose/Problem Statement: Computer-based educational games have become popular teaching tools at medical colleges, in part, because social-behavioral research indicates that game design elements can stimulate productivity and increase motivation in learners, as well as improve student satisfaction. Although some evidence suggests that game-based learning is fun and motivating for medical students (1), only a few studies have directly assessed whether online educational games actually improve learning outcomes, as measured by test performance (2,3). Cranial Pursuit© is a set of 16 online games developed at Albany Medical College to help first year students learn neuroanatomy. The games use interactive graphics, motivational features and real-time feedback to help learners memorize key anatomical facts and apply them to clinical problem-solving. During a 2-year initial trial period, 94% of students surveyed rated the games as "highly effective" or "effective" as a learning resource. However, direct evidence that playing the games improved performance on exams was lacking. Therefore, we designed a prospective, randomized, controlled study with 2 aims; 1) to determine whether playing Cranial Pursuit© online educational games increases learning measured by pre-test/post-test difference and 2) to assess various subject attributes on learning outcomes, motivation and satisfaction.

Methods/Approach: An IRB-approved pilot study was conducted online with volunteer subjects recruited from a pool of 150 students who were accepted into the Class of 2018, and who could participate for 3 consecutive weeks prior to matriculation. Four control and 6 treated subjects were enrolled, de-identified and completed the study. All subjects took a 15-question pre-test, listened to two 45-minute lectures, and logged the time they spent studying. The treated subjects did the same, but also used a subset of 4 Cranial Pursuit© games. After a 2-week period of study, all subjects took a 15-question post-test and completed a brief survey. Independent variables on the survey included various attributes (e.g. time spent studying, VARK^{TM} learning style, interest in the subject, age and gender). Comparisons between the pre-test/post-test difference of the control and treated subjects were made using a repeated measures 2-way ANOVA.

Results/Lessons learned: The mean post-test scores of all subjects was significantly improved compared to the pre-test scores ($p<0.0001$). The control group overall scores improved on average 35% ± 9 while the treated group improved 53% ± 5, but these differences were not significant ($p=0.09$). Compared to controls, subjects that used the games performed better on problem-based questions ($p=0.04$) compared to fact-based questions ($p=0.33$). The two groups were similar in age, gender, and amount of time spent listening to the lectures; however, there was an unequal distribution in learning styles.

Discussions and conclusions/Significance: Adoption of computer-based educational games has outpaced studies assessing their effects on learning. We studied the effect of educational games on test performance and learner attitudes. Data from the current study suggests that subjects utilizing games may perform better on tests. However, the study was limited by low participation and variable motivation of the subjects as well as by the unequal distribution of learning styles. Further investigation is warranted to increase participation and control variability in learner styles. Conducting the study during the academic year may increase participation but could reduce group differences in performance, as motivation is increased by high stakes testing. Analysis of learner attributes (Chi-square) related to game-based learning during the academic year would be valuable and the relationship between test performance and learner

attributes would be assessed using a Pearson correlation coefficient. We are currently seeking partners for inter-institutional research to continue the study of the impact of Cranial Pursuit© on learning outcomes and learner attitudes.
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Short Communication 62: Team-Based First Year Gross Anatomy Using Modular Scheduling, Rotating Team Leadership and Clinical-style Handoffs to Promote Teamwork, Communication and Accountability

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Purpose/Problem Statement: Hands-on dissection in gross anatomy, while extremely valuable, is a time-consuming process in which the isolation and identification of structures often leaves little time for integration of physiological function or clinical/radiological correlations.
Methods/Approach: Nearly four years ago the anatomy faculty was charged with determining the future of anatomy education because of a unique opportunity afforded by the Governor's commitment to BioScience CT that included creation of new academic space and renovations to existing space. After long deliberations, the faculty concluded that a hybrid curriculum with cadaveric anatomy and virtual anatomy would provide the optimal learning environment. To this end, one of the Human Anatomy Labs will be undergoing transformation to a Virtual Anatomy Lab this summer, requiring the school to consider the challenges of scheduling all students to have opportunities to work and partner in both lab settings. In support of this effort, and in preparation for curriculum reform, we have piloted a team-based approach to gross anatomy that uses modular scheduling of alternating 4-person teams that collaborate on the same cadaver. A rotating team leader, designated for each session, is responsible for organization of the group effort and must be meticulously prepared in the session goals, objectives and approaches to be used. For the initial section focused on anatomy of the extremities, modular scheduling was implemented without the use of a formal handoff system. For subsequent sections of anatomy, based on lessons learned (see below), a handoff system patterned after those used in clinical settings was implemented. The prior team leader was required to meet face-to-face with the current team to describe progress on the previous dissection along with any challenges encountered before signing off to the current team leader. The prescribed handoff form resides in a notebook kept at the workstation and includes the following elements: 1) Sign-off of prior and current team leaders, 2) Peer evaluation of the progress and quality of dissections performed by teammates in the prior session, 3) Session progress report on structures identified and structures missing/not found, 4) Table progress report on overall team progress (Are dissections complete and on schedule? If not, how will this be addressed as a team?), 5) Cadaver charting of anatomical variations/anomalies and clinical interventions discovered (e.g. scars, ports, pacemakers, "-ectomies").
Results/Lessons learned: There were several immediate benefits of implementing a modular schedule in anatomy. All students had the opportunity for hands-on dissection, but spending fewer contact hours in the lab allowed more time for learning from dissections performed by their colleagues. In addition, the number of anatomy preceptors in lab was effectively doubled, since the number of tables to staff was halved. However, several challenges arose initially,

notably difficulty enforcing team leadership responsibilities, reluctance of students to communicate with their alternating team and a perceived lack of accountability to their teammates. Students sometimes expressed frustration that the dissections done by the "other team" were incomplete or poorly done. Preliminary evidence suggests that these problems have been largely mitigated by face-to-face handoffs at the start of each laboratory session. Team leaders have been more accountable and better prepared, peer evaluations on the handoff form are generally quite positive, and overall team progress is on par with expectations.
Discussions and conclusions/Significance: Modular scheduling in anatomy is an innovative approach to traditional cadaveric dissection that will provide more time for learning anatomy alongside important clinical and radiological learning correlates. This will be accomplished in our revised curriculum using a Virtual Anatomy Lab equipped with resources such as virtual cadaver tables, radiology workstations and ultrasound (both live and simulation).
Reflection: The use of clinical-style handoffs in first year anatomy is a novel way of introducing early learners to this critical practice, which will later become essential to them in clinical settings for efficient interprofessional communication, teamwork, accountability and patient safety.
References: Lazaus M, Dos Santos J, Haidet P Pre-Clinical Anatomy Education: An Ideal Environment for Learning Clinical Communication Skills. FASEB J 29 (1) Suppl 691.6, 2015

Short Communication 63: Development of an Interactive Session to Teach Medical Students the Clinical Anatomy of Stroke Utilizing 3D Models Derived from Patient Imaging Data

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Purpose/Problem Statement: A strong foundation in functional neuroanatomy and its blood supply is essential for identifying and interpreting stroke symptoms. Educating future physicians to localize lesions using clinical imaging requires an understanding of the three-dimensional (3D) anatomic relationships of brain and vascular structures. Studies assessing the effectiveness of student learning using 3D physical and virtual reality models in the setting of anatomy education have yielded mixed results (reviewed by Fredieu et al., 2015). Therefore, it is important to assess which 3D visualization method will be most efficacious for viewing the clinical anatomy relevant to understanding stroke, especially given decreasing amounts of instructional time allotted for the preclinical curricula.
Methods/Approach: Interactive educational sessions have been developed for teaching key clinical anatomic relationships relevant to stroke utilizing physical, 3D-printed and virtual, 3D computer-rendered models created from computed tomography angiography (CTA)-derived patient imaging data. During the interactive sessions, students explore either physical or virtual 3D models and identify brain and vascular structures, noting their spatial relationships. Identification-based, function-based, and clinically-focused questions have been developed to assess students' ability to recall information on vascular anatomy and vascular territories, and apply it to clinical problems in the context of lesion localization in stroke cases. The efficacy of using 3D physical versus virtual models as teaching methods will be compared by evaluating student performance on pre-and post-test assessments as a measure of student learning. In addition, students will complete a survey and answer questions related to the effectiveness of the 3D model as a learning tool, ease of use, recommendation of future use, and overall satisfaction. The 3D visualization methods determined to be most efficacious will be implemented in the second year clinical neuroanatomy curriculum as an expansion of the existing stroke module.
Results/Lessons learned: Data will be presented on (1) the creation of 3D virtual and physical models of brain and cerebral vascular structures from patient imaging data, (2) the development

of the interactive educational sessions utilizing these 3D models, and (3) the multi-level outcome measures designed to evaluate these teaching methods.
Reflection: The field of medical education will benefit from the development of multi-level 3D models illustrating key clinical anatomy relationships. The proposed study is unique because of its use of multi-level 3D models for stroke education. Providing future physicians with additional opportunities to use 3D visualization methods to study key clinical anatomic relationships early in their medical training has the potential to meaningfully impact the future of stroke care.
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Short Communication 64: Horizontal and Vertical Integration of Pre-Clerkship Microbiology and Clinical Infectious Diseases

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Purpose/Problem Statement: The authors identified three challenges to medical student's ability to optimally apply basic microbiology knowledge to the clinical care of patients with possible infectious diseases: 1. Too much focus on teaching micro-organisms didactically and requiring learners to rely on rote memorization at the expense of creation of robust mental models of clinical presentations.1 2. Too little focus on cognitive load theory in curricular design to avoid overwhelming learners with the vast expanse of micro-organisms and associated scientific information.1 3. Even with the growth in horizontally integrated pre-clerkship curricula, an inability to identify which specific skills and knowledge will be improved through the integration.2
Methods/Approach: We implemented an innovative horizontally and vertically integrated pre-clerkship microbiology/infectious diseases curricula. Within the pathophysiology course, students learn microbiology in the first 4-week block of the second year. Learning activities are equally divided in thirds with students spending equal time in the following educational methodologies: Case Based Learning (CBL), Lecture, and Problem Based Learning (PBL). PBL cases include influenza, community acquired pneumonia and community acquired meningitis. The focus for the pathophysiology course is to teach general principles of microbiology through specific examples of clinically important micro-organisms, while also highlighting the clinical presentation of these organisms in CBL and PBL. Simultaneously, in the clinical skills course, students learn to perform a hypothesis driven history and physical examination for patients presenting with fever and associated symptoms. Students subsequently rotate through a two station (1- fever and rash in a returning traveler and 2- Fever and monoarticular knee arthritis) formative OSCE. Subsequently the students submit notes on these standardized patient encounters to clinical skills faculty members and then perform oral presentations in small groups. These oral presentations include a clinical question presentation on a self-directed topic using the PICO format. This is followed by students completing illness script worksheets for these patients to broaden differential diagnoses and delve more deeply into the microbiology and epidemiology of the potentially culprit infectious diseases. Subsequently, students are asked to role-play sharing their most likely diagnosis in each case with the "patient" and educating him/her about the diagnosis in an effort to allow students to assume the RIME level of educator. Vertical integration occurs over the remainder of the year as additional microbiology is covered when applicable to the corresponding organ system block. In addition, a mid-year 4-station Formative OSCE and end of year 5-station Summative OSCE include cases that involve the clinical presentation of fever.
Results/Lessons learned: The educational activity was implemented in 2014 and 2015. A review of course evaluation and student surveys demonstrates that learner satisfaction with this

curriculum has been high. Students are aware of and appreciate the horizontally integrated curriculum. The course leaders meet regularly to ensure thoughtful integration is occurring and also to discuss how to minimize the cognitive load of learners through the provision of supportive information and just in time information. Through this process, the course leaders simplified one of the OSCE cases and a PBL case.
Reflection: This educational session is an example of a curriculum with significant horizontal and vertical integration of microbiology and infectious diseases content. The authors believe that this degree of horizontal and vertical integration between pathophysiology and clinical skills courses is unique and appears to expedite the development of clinical reasoning in our students. Anecdotally, clerkship directors and clerkship faculty members have informed us that our students demonstrated more advanced clinical reasoning skills than they had expected at the start of the third year. Future goals involve formally assessing student clinical reasoning over the second year and comparing this data with other schools that use alternative, and more traditional, approaches to microbiology curriculum. We believe that this approach can be implemented at other institutions to improve student retention of basic microbiology, application of this information to clinical cases due to decreased cognitive load and improved clinical reasoning through more robust differential diagnoses.
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Short Communication 65: Case-Based eBooks to Enhance the Integration of Clinical Science in Basic Science: Teaching Radiology-Anatomy Correlation in the Gross Anatomy Lab Using eBooks

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Purpose/Problem Statement: The large body of medical literature shows the importance of connecting basic science and clinical knowledge in medical education. Educational methods such as case-based learning or problem-based learning seem to be effective instructional strategies to enhance students' clinically integrated learning from the first day of medical school. Although medical schools agree on the effectiveness of case-based learning for the vertical integration, it remains challenging for the educators to implement case-based learning with clinical materials in a specific setting like the gross anatomy lab. How to present different clinical cases with radiologic images in the gross anatomy lab? How can students access, examine, and manipulate the radiologic images around the dissecting tables? How to introduce the first-year medical students to the radiologic disorders that they would encounter throughout their education and practice?
Methods/Approach: To facilitate the cased-based learning in anatomy lab, an interdisciplinary team at NYU School of Medicine designed a series of multi-touch eBooks for Morphological and Developmental Basis of Medicine(MDBM) Trunk program Through these hands-on eBooks, we aim to provide the first-year medical students with an innovative way to learn radiology-anatomy correlation in the gross anatomy lab. Rooted in the empirically derived theories of cognitive science and multimedia learning principles, the eBooks help students recognize radiologic exposure of normal anatomic concepts as well as classic radiologic disorders. Segmented into nine eBooks, each book of 10-20 pages present learning objectives, radiologic images of normal anatomy, clinical cases, radiologic disorders, review questions, and teaching points. in small chunks, with highlighted images, and self-assessment questions. Pre-downloaded on iPads in the the gross anatomy lab at NYU School of Medicine, the nine eBooks also facilitate

students to get access to plain radiographs, cross sectional CT and MR imaging as well as videos of fluoroscopic and CT studies, while they are working on human anatomy.
Results/Lessons learned: The well designed hands-on eBooks can provide students with timely knowledge on radiologic images in the anatomy lab. The interactive features of the eBooks enable educators to include various media as well as review questions. The eBook format also allows an easy distribution of the content beyond our institution. We are collecting students' feedback to evaluate the acceptance of the new technology. The evaluation results will help us update the eBooks to meet students' needs.
Discussions and conclusions/Significance: The clinical cases in the eBooks support the longitudinal curriculum. The cases enable students to become acquainted with the appearance of classic radiologic disorders which they will encounter on their clinical clerkships and appreciate use of radiology in patient assessment/diagnosis.Reflection: It is difficult to measure the learning outcomes tied to the eBooks. However, for the future, we should plan a rigorous research to assess the changes in knowledge gain or leaning behavior.
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Short Communication 66: Development of a Cost-Effective, Flexibly-Scheduled, Resident-Led Surgical Skills Course

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Purpose/Problem Statement: Current duty hour restrictions create a significant challenge in providing valuable hands-on experience and technical skill development for surgical trainees and medical students. Although an effective teaching mechanism utilizes structured simulation training, traditional models and labs require dedicated time, space and funding which is a limitation. Intern and student participation in traditional structured labs can be limited by daily work responsibilities. We sought to design a course to educate interns and medical students on the technique and indications for common skills and predictable challenges encountered during intern year, utilizing cost-effective and flexibly-scheduled simulation modules.
Methods/Approach: We conducted a literature review using search terms relevant to surgical skills simulation and training. Costs for surgical models and trainers were estimated based on a local surgery simulation lab and online retailers. We designed an intern-developed and resident-taught curriculum to teach common technical skills and management of anticipated challenges encountered during the intern year. The course is comprised of 10 hands-on and didactic educational modules taught prior to the start of the intern year in June, and revisited again at each program rotation site biweekly over the academic year as a longitudinal learning experience. Modules are taught by senior surgical residents and attended by 5-7 interns and medical students on surgical rotations. The scheduled module is taught twice each month ensuring attendance by every intern and student. Modules include: peripheral IV placement and lab draws, ABG and arterial line placement, central venous catheter placement, chest tube insertion, management and troubleshooting, sutures and knot tying, NG tube placement and management, foley/coude catheter placement, radiology indications and interpretation, 'middle of the night calls' simulation and a mock code session. The budget to create the longitudinal simulation models and purchase supplies totaled approximately $500. We created a semi-flexible schedule for the academic year, allowing the sessions to be taught spontaneously

during defined months by residents on service, alleviating some of the logistical challenges that arise with protected time and materials. Pre and post-session assessments are administered to participating students and interns to assess confidence in identifying indications for the procedure, performing the procedure and managing acute complications relate to the procedure.
Results/Lessons learned: We successfully completed two of the simulation sessions and mapped the schedule for the remainder of sessions. We have gained budget approval by the Department of Surgery to create the necessary models to complete the modules. The first module on NG tube placement was attended by 3 students and 4 residents and the chest tube session was attended by 4 students and 3 residents. Preliminary results revealed increased overall skill confidence scores from 3.2 to 8.8 in the nasogastric tube session and 1.9 to 5.7 in the chest tube session for medical students. Intern confidence scores showed no significant change in the nasogastric tube session but increased from 3.2 to 6.5 in the chest tube session. Largest gains were observed in the confidence scores for procedure performance and acute complication management.
Discussions and conclusions/Significance: Surgical interns designed the course and applied for funding, gaining valuable experience in curriculum development. Surgical residents are the primary leaders in the skills sessions, developing teaching skills. Surgical trainees and medical students must utilize simulation to achieve competency in the setting of modern work-hour restrictions. Our aim was to improve general competencies relevant to surgical internship but also address self-reported deficits specific to our interns and medical students. Sessions involve impromptu teaching, cost-effective DIY models, technical skills development, and team communication and identify individuals strengths and weaknesses in a safe simulated environment, addressing limitations in current surgical intern and medical student education.
Reflection: Areas for improvement include cost reduction for materials and standardizing education quality between resident-teachers. It remains critical to recruit intern and resident leadership to schedule, organize and lead the course. The course modules, objectives, budget, DIY models and assessments are transferable and easy to implement at other programs.
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Short Communication 67: Send-A-Song: A Musical Engagement Project for Health Professional Students and At-Risk Youth

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Purpose/Problem Statement: Scholars in the field of medical humanities and narrative medicine explore humanistic engagement as a means to developing empathy, deeper awareness of the intersubjectivity inherent in patient-doctor relationships, and understanding of patient experiences in context (1). Music has been recognized as an affective, communicative, highly contextual narrative art across disciplines. In addition, the healing effects of music and music's ability to promote processes of empathy and identity formation in patients and at-risk

youth have been well studied (2). Yet, the use of music in medical education, as a means of connecting with patients and developing empathy, has been largely unexamined.

Methods/Approach: In Send-A-Song, health professional students work together to create personalized songs for children with medical and psychological needs. The project is open to both musicians and non-musicians and included medical, nursing, public health, and pre-college students interested in the health professions. Nine students volunteered to participate in five two-hour sessions during which they each created a personalized song for a child in foster care. The song creation was based on a song request form from the child,which contains information on the child's preferred musical styles and themes. During the sessions, students referenced these preferences as they learned how to write lyrics and produce and record an original song. The completed song and a personalized video message from the student is then sent to the child's clinician and shared with the child. A song-sharing celebration takes place at the foster home. We conducted an IRB-approved pilot study to evaluate the impact this music-based program on health professional students development of empathy and efforts to gain insight into patients' experiences. The study uses mixed evaluative methods: the Interpersonal Reactivity Index (IRI), a validated psychological scale which explores mechanisms of empathy engagement; a post-program survey to understand how subdomains of the IRI are affected; and a focus group session to explore the students' experiences.

Results/Lessons learned: In this pilot study (n=9), IRI scores showed no significant increase in empathy scores. However, in the post-program survey, students reported that the program particularly engaged certain specific IRI empathy subdomains. When asked to rate the extent of engagement of IRI empathy subdomains on a scale of 1-7 (7=most engaging), students rated the subdomains of perspective taking and empathic concern very highly (6.67/7). When asked which particular project components were most engaging, students rated empathizing with a child (6.11) and supportive student interactions (6.00) highly, and development of musical skills (5.33) somewhat less highly. These findings were supported by findings in the focus group interviews.

Discussions and conclusions/Significance: Send-A-Song demonstrates the uniquely powerful ways in which music fosters connections and changes attitudes for both student songwriters and pediatric recipients involved. In medical education research, there is a lack of research on music in medical humanities education. The latest and only paper published on the use of music in medical education involved a music curriculum with student evaluation summaries as its sole evaluative method (3). Furthermore, there is no systematic evaluation or framework which incorporates music into medical education. The present pilot study seeks to provide such a framework to allow programs of this kind and the inclusion of music in the richly diverse field of medical humanities. Send-A-Song could further be expanded to engage students at other medical schools, and members of numerous other populations who would benefit from empathy-development through music composition.

Reflection: The focus group responses revealed Send-A-Song was particularly effective in fostering connection and belief in music as a form of helping and understanding others. One student said, "a lot of people might want to empathize with foster children, but they never want to give back to the community in the way that music or art is involved and I think that'd be great. Another child wrote that the program "helped me believe more in happiness." An example of a song, "When She Smiles," can be heard (see hyperlinks supplement), with accompanying video message (see hyperlinks supplement). Although the pilot study did not include evaluation of impact on foster children, the song sharing celebration revealed how powerful the songs were for the children. One of the foster girls memorized every word of "You've Got to Be Yourself" (see hyperlinks supplement) with her own choreographed movements, and asks for the song to be played every day as her "calming down song". The clinicians enthusiastically shared that the songs helped the girls cope with their histories of trauma and neglect, and was a deep form of personal connection, as the thank you cards (see hyperlinks supplement) also attest to.

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Short Communication 68: Do Standardized Patients Have Concerns About Students not Captured by Traditional Assessment Forms?

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Purpose/Problem Statement: Standardized patients (SPs) have been shown to be a reliable and valid means to assess medical students' clinical skills in clinical skills examinations (CSEs). We noticed, however, that SPs often express "off the record" concerns about students that they do not include on traditional assessment forms. The purpose of this study was to capture and analyze these off the record" concerns.
Methods/Approach: The Mid Atlantic Consortium (MAC) is a group of medical schools that collaborate to create a six-station end-of-third year clinical skills examination, which we give to all our consortium students. Three of the 7 MAC schools participated in this study, conducted on the 2012 examination. To encourage SPs to express their "off the record" comments, we added an ungraded Concerns Item to the (MAC) traditional end-of-third year exam SP rating form. We used both quantitative and qualitative methods to analyze the results of the Concerns Item to answer the following study questions: 1. How often did SPs use the Concerns Item to indicate special concerns about students? 2. What was the nature of the concerns that SPs expressed in their comments on the Concerns Item? 3. Did the Concerns Item identify poor performing students not captured by the traditional assessment form?
Results/Lessons learned: Of 551 students at three schools, SPs indicated at least one concern (possible or strong) in 223 (40%) of students and two or more concerns in 70 (13%). Over half the concern themes gleaned from the SPs' written comments included communication/interpersonal skills and behaviors commonly addressed in communications courses: lack of empathy, good listening skills and lack of connection to the patient. They also included items that in our experience are less commonly addressed: odd or off-putting mannerisms, lack of confidence, unprofessional behavior, domineering behavior and biased behavior. Another 47% of concerns themes identified deficiencies in history taking and physical examination. Of the students with concerns noted by two or more SPs, 45/70 (64%) would not have been identified as poor performers by the traditional assessment form.
Discussions and conclusions/Significance: Overall, when given the opportunity to complete a Concerns Item, SPs often indicated special concerns about students they encountered in a clinical skills examination. This item may be useful in identifying at-risk students that may not be identified by the traditional assessment form. It provides a simple means to alert busy educators to students whose videos and evaluations need to be reviewed, and if they verify SPs' findings, on whom clinical skills enhancement should be concentrated. The Concerns Item may also be useful in identifying areas for further development in clinical skills curricula. Future studies are needed to correlate the Concerns Item ratings with long term outcomes, such as clerkship and Step 2CS performance, to determine the ultimate usefulness of adding a Concerns Item to the traditional form used to assess students in a clinical skills examination.
Reflection: The Concerns Item has the potential to be a useful addition to the traditional SP assessment form in a number of ways. First, it may identify "at risk" students who may not be

captured using the traditional rating form. Second, the Concerns Item, with its emphasis on narratively-expressed SP opinion, may provide educators and students with a unique assessment perspective. The importance of the narrative "voice of the SP" has received very little attention in the literature and is complex, since it may be influenced to varying degrees by an SP's duty to represent the public and by educators' training guidelines as well as an SP's personal reactions. The SP voice, in all its complexity, provides a rich source of contextual information about learner's communications skills which may not be captured in checklists or in faculty appraisals of performance in clinical skills examinations

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Short Communication 69: Quantitative Outcomes of Longitudinal versus Traditional Block Students in Surgery

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Purpose/Problem Statement: Proponents of Longitudinal Integrated Clerkships (LICs) during the major clinical year (MCY) of medical school have suggested they may offer significant advantages compared to traditional block clerkships. The latter, it is argued, foster fragmented relationships, leading to the potential for ethical erosion in patient care and the dilution of real clinical learning into self-conscious performance. Recent studies have provided support for the qualitative superiority and quantitative non-inferiority of LICs.[1] The longitudinal approach to surgery specifically, however, has not been studied. Questions about the nature of continuity in general surgery, the unusual requirements of learning in the operating room, and the willingness of general surgeons to build collaborative relationships as preceptors have kept surgery on the margins of the longitudinal debate. This study compares testing outcomes in general surgery for longitudinal versus traditional block students. Columbia sends a group of traditional students every rotation to Bassett Healthcare Network, where our 10 longitudinal students also train for the year, making real time, side-by-side comparisons possible.

Methods/Approach: We utilized testing outcomes for all of our longitudinal and traditional block students from 2012-2015, including scores on both the Surgery Clinical Science Subject Exams (Shelf) and on the Clinical Skills Exam (CSE). The latter is a test of surgical knowledge of our own design that we have been using since 2011; it has been described and validated elsewhere.[2] The CSE questions are sub-grouped by clinical category, including history, physical exam, differential diagnosis, radiology, management, complications and patient communication. We also looked at performance by question type. Outcomes on the exams and these sub-groups were compared using independent samples t-tests

Results/Lessons learned: Over three years, the mean on the Surgery Shelf Exam was higher for the longitudinal students than for the traditional block students training alongside them at Bassett Health (77 vs. 70, p = .001, Figure 1). There was no statistical difference in CSE scores between the longitudinal and traditional students, including amongst those students who were given identical exams. (Figure 2) We found no statistical difference by question sub-type on the CSE.

Discussions and conclusions/Significance: If longitudinal programming is going to be widely implemented, its ability to expose students to and train them in the principles of all the core disciplines, including surgery, must be assessed. We found statistically higher scores on the Surgery Shelf for our longitudinal students and no statistical difference in scores on our internal

surgery Clinical Skills Exam. There are multiple possible causes for the observed differences on the Shelf, including not just the overall curricula, but also different test preparation methods, timing of the exam in the year, and baseline differences in the cohorts. Nevertheless, with these outcomes in mind, we are currently assessing qualitative variables including the students' integration of surgical learning with other disciplines, the strength of relationships formed with surgical educators and patients, and the level of comfort and familiarity gained with surgical culture and the operating room environment.
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Short Communication 70: An Innovative Clinical Skills 'Boot Camp' for Dental Medicine Residents

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Purpose/Problem Statement: Dental school graduates in New York are required to complete a year of residency before licensure. In 2013, Winthrop University Hospital accepted its first class of Dental Medicine Residents (DMR) requiring a two week rotation in the Emergency Department (ED). They lacked basic emergency medical knowledge and skills. We designed a "Boot Camp" during orientation as an intensive strategy for clinical skills in our Simulation Center.
Methods/Approach: A multidisciplinary collaboration curriculum with didactic and practical sessions included: A. Physical Assessment: Heart/Lung Sounds/Vital signs/Simulator guidance B. Sterility: Gowning and sterile technique C. History/Physical: Review of H&P; progress notes; presentations; practice and assessment with Standardized Patients D. Skills: IV placement, airway management, blood draw using task trainers and high fidelity simulators E. Emergency Preparedness: CPR/ACLS; simulator-based cases F. Communication and Professionalism: Who's Who in the Hospital, SBAR, patient interview skills; role playing clinical cases
Results/Lessons learned: Dental Medicine Residents (n= 20) completed a Pre- and Post-test assessment to evaluate skills and confidence levels during the 'boot camp'. We measured gains in 6 confidence questions (5 point Likert Scale) compared with 15 knowledge questions. Pre–Post confidence levels increased on average of 2 mean points. Percent correct knowledge responses improved from 40-50% Pre to 65-75% correct Post 'boot camp'.
Discussions and conclusions/Significance: Our innovative DMR "Boot Camp" measured clinical skills and patient care management bereft in their dental school curriculum. Assessments indicated improved confidence and knowledge prior to their hospital-based rotations. Based on literature review, student education and simulation in oral surgery residencies, are only applications to clinical emergency management skills, not as an introduction for DMR.
Reflection: Further data is required to develop our Boot Camp model. Longitudinal assessments will verify significant difference over subsequent resident years and improving their knowledge retention and relevancy to their eventual practice settings.
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POSTERS

Poster F-1: Mentorship and Professionalism in Training (MAP-IT): A Humanistic Mentoring Program at NS-LIJ Health System

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Purpose/Problem Statement: The completion of a year-long interactive program of small inter-professional groups will enhance the ability of physicians and nurses to more effectively guide their mentees toward a humanistic approach in their clinical practices and professional interactions with colleagues. Humanism and professionalism are two things that are essential for healthcare workers, but these are not necessarily behaviors that the current education system focuses on. Mentors are thus in a pivotal position to positively impact the development of younger professionals.Methods/Approach: A Mentoring and Professionalism in Training (MAP-IT) program was adapted from a well-developed faculty development program developed by William T. Branch, MD. The 2014-15 cohort of RNs and MDs included 28 “Uber” Mentors and 65 “High Potential Mentors” (HPM). Each HPM, nominated by their departments, was a mid-career level clinician educator who was currently mentoring early career professionals. These HPM were divided among into ten small groups of no more than nine people, and meetings were held once a month for ten months. Monthly meetings were centered on a relevant curriculum topic, such as Active Role Modeling, Team Building, Difficult Feedback, Cynical Humor, Medical Error, Well-Being/Resilience and Mindfulness. These small group sessions consisted of written reflections, sharing of reflections, role-plays/case studies and discussions around reference articles. The other two meetings were “Objective Structured Teaching Encounters” (OSTEs): mentoring simulations with a standardized learner (RN/MD) who is trained to give feedback to the HPMs. The pre/post program OSTEs was designed as a session to offer the HPMs opportunity to practice their mentoring skills and receive formative feedback. Data was collected using three instruments: Humanistic Teaching Practices Effectiveness (HTPE) Self Assessment, a Mentoring Competency Assessment (MCA) completed as a self and standardized learner assessment for each OSTE, and a Post Program Evaluation that included both quantitative and qualitative data from all Ubers and HPMs. All data was anonymized, collated, and analyzed to look at trends between pre and post-program responses. Overall qualitative themes relevant to developing mentorship skills within a longitudinal small group inter-professional learning environment were also identified.Results/Lessons learned: From the HTPE survey, only one of the twelve items, “listening carefully”, showed no significant improvement between pre and post program for the HPMs. As for the two sets of survey data from the OSTE’s, the HPMs self-rating showed significant improvement between the two sessions. Many mentoring criteria were very significant, and these responses were correlated highly between the HPMs and their standardized learner. The program evaluation survey yielded answers that were positive towards the eight program outcomes, and all session content was rated positively by both Ubers and HPMs. There were also open text boxes for several questions in the post evaluation survey. These responses were read separately by two individuals and categorized according to themes. The most common themes throughout were: interacting with others, mentorship, positive program assessment, personal growth, future applications, and humanism.Discussions and conclusions/Significance: n/aReflection: A “community of practice” inter-professional faculty development model focused on mentoring skills can be offered longitudinally. Lessons learned included: - Inter-professionals benefit from small group meetings, away from the clinical environment, to discuss relevant curriculum topics - Pre/post work was self-directed - only requirement was be in the moment for 90 minutes a month in assigned small group. Feedback indicated this was not wasted time" - Reflection

through personal stories and learning through experiential cases were particularly helpful - Interprofessionalism: UBER facilitators: RN/MD pair, RN/MD HPMs - Selection criteria for 1st cohort selected the right peopleReferences: Branch WT "Teaching professional and humanistic values: Suggestion for a practical and theoretical model" Patient Education and Counseling. 2015; 98(2):162–167 Branch WT Jr, Frankel R, Gracey CF, Haidet PM, Weissmann PF, Cantey P, Mitchell GA, Inui TS. A good clinician and a caring person: longitudinal faculty development and the enhancement of the human dimensions of care. Acad Med. 2009; 84:117–126. Branch WT Jr. The Road to Professionalism: Reflective Practice and Reflective Learning. Patient Education and Counseling. 2010; 80:327-322.

Poster F-2: Creating a Virtual Medical Education Journal Club for your Colleagues

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Purpose/Problem Statement: Clinician Educators would benefit from regular medical education journal clubs to provide protected time to discuss current medical education literature, best educational practices and application of educational outcomes across the continuum of medical education. However, attendance at such meetings, especially amongst busy clinician educators can be a barrier to participation and therefore success. Web-based online learning (asynchronous and synchronous) has become an effective pedagogy for professional development and can be a suitable platform for a medical education journal club. Due to increasing time constraints and demands in the clinical care settings, medical educators need to be able to share ideas and best practices in an efficient and timely manner and not leave their clinical sites. Geographic constraints, even among hospital affiliations in larger academic medical centers, are limited by the ability of busy professionals to participate in face to face meetings to review medical education innovations and scholarship that is of interest to diverse clinical disciplines. Furthermore, online delivery can promote self-directed higher-order learning by adding “flipped classroom” pedagogy if pre-readings are assigned to registered participants.Methods/Approach: This seminar would be of value to all medical educators: clerkship/program directors, and core teaching faculty at all levels of their careers (junior/senior) and in all settings (hospital, ambulatory clinics and medical school). Online journal clubs goals include discussion of best practices in medical education, critical appraisal of medical education research literature and synthesis of ideas for educational interventions and future collaborative educational research. Logistics to assure success will be discussed. In addition, skills needed by faculty to successfully deliver and facilitate an online journal club will be discussed. We will provide step by step directions on creating an online journal club using two formats: institutional based facilitators and invited article authors, including selecting a web-based platform, example content to be covered, and setting up a server site to archive the online sessions. Surveys are sent to faculty facilitators and participants post each journal club to determine satisfaction with the content and logistics. Data collected to date from eight sessions will be shared.Results/Lessons learned: Setting up an online journal club (N=8) is possible and can support discussion of medical education literature among diverse participants at a distance. There are many logistics to be considered prior to the actual session and during the session to assure success. A dedicated professional must be accountable to the process for all the preparation steps and actual delivery of the session. The actual session requires two people present: the speaker and a person to handle any logistical issues. Article selection by the facilitators requires a focus on a topic generic enough to a diverse medical education audience, as participation is not discipline specific. Actual delivery of content requires an interactive PowerPoint presentation with probing questions to guide discussion. Assuring participants are engaged in the discussion is very challenging.Discussions and conclusions/Significance: Setting

up an online journal club is possible and can support discussion of medical education literature and scholarship among diverse participants at a distance with a faculty or author facilitator. This effort can support collborative medical education scholarship.Reflection: Keeping the goal in mind, an online professional development opportunity focused on review of medical education literature, drives the effort required to prepare and present a successful virtual journal club. If such a format proves successful, programs can replicate the format to extend education across disciplines and to other content suitable for online learning platforms. Thus, virtual learning serves as an innovative way to facilitate cross communication amongst clinician educators and promote possibilities for collaborative medical education scholarship.References: Chan T, Thoma B, Radecki R, et al. (2015) Ten Steps for Setting up an Online Journal Club. Journal Of Continuing Education in the Health professions; 35(2):148-154. Thoma B, Rolston D, Lin M. (2014) Global Emergency medicine Journal Club: Social Media Responses to the March 2014 Annals of Emergency Medicine Journal Club on Targeted Temperature Management. Annals of Emergency Medicine; 64(2): 207-212.

Poster F-3: Faculty Development Using Digital Badges

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Purpose/Problem Statement: Healthcare professionals oftentimes find themselves asked to teach or want to enhance their teaching skills. The need for educational faculty development increased with the Carnegie Foundation Report of 2010 request for medical education reform1 and the expanding medical knowledge and new educational technologies. Journal articles give topics, but not the confidence and competence to apply. Medical education degree programs, conference seminars, and educational workshops cost professionals' time away from their practices. The challenge to professionals' schedules to attend physical locations is a reason to use online faculty development programs2. Why use digital badges? A digital badge is an electronic token embedded with the user's name and achievements for display in signature lines, CVs, ePortfolios and social media. Awarding a digital badge motivates users to complete the learning and recognizes their achievements on specific topics 3. The purpose of this study is to investigate the outcomes of BUSM+ Medical Educational Digital Badge Program (BUSM+) that is open access, online, asynchronous and offered 24/7 to address the faculty development needs of healthcare professionals. By the end of BUSM+ Fundamentals of Teaching and Learning course, the users will be able to engage in an online faculty development program with digital badges and apply the content to their learning situations.Methods/Approach: BUSM+ is an online, asynchronous course offered globally with ten sessions each having pre- and post-session quizzes, interactive videos, application assignments, zipinars (relevant topic updates), feedback surveys, three badge levels and Continuing Medical Education credit. BUSM+ users registered for a 2015 winter (W) or summer (S) course on a website, attended the course in Blackboard LMS, and stored badges in Mozilla Open Badge Infrastructure. This is a mixed-method study that combines quantitative demographic data, assignment results, and test scores with qualitative data gathered from users' feedback. W course data assisted in revising the S course. The revisions included more tutorials, navigation cueing, a submission game, and Skype community chats with BUSM+ faculty. A flexible submission schedule of 24 weeks allowed easier session completions.Results/Lessons learned: The W and S courses had 168 registrants from Armenia, China, and eight US states. Over half of the users had doctoral degrees. The users were between 30-50 years and mostly female. Sundays and Tuesdays were the most popular access days. Looking at the revised S course, an analysis of the session testing has a p value = <.0001 and showed a significant increase in learning between the pre- and post-tests. Nine registrants never accessed BUSM+ due to a job change or technical

difficulties. 20 users participated in the All Stars scoreboard game. 30% of the users completed their badge goals. The majority of users attended BUSM+ to enhance teaching skills. The professions represented were practicing physicians, educators, hospitalist, nurses, rehabilitative therapists, a veterinarian, administrative directors, fellows, and medical students. Despite some technical issues, 88% of the users recommended BUSM+ to a colleague.Discussions and conclusions/Significance: Healthcare professionals jumped at the opportunity to engage in BUSM+ so there is a definite need for digital badge programs. Utilizing BUSM+ and motivated by the digital badges, the users learned significantly from the sessions as seen in the post-tests and could apply the topics to their learning situations in worksheets, discussion forums, blogs, and journals. Digital badge programs can supplement formal educational programs by recognizing specific new competency areas and share best practices in teaching. Lessons learned from BUSM+ 2015 will apply to future digital badge projects on residents-as-teachers and educator-track promotions.Reflection: Although available online 24/7 with a flexible submission schedule, the study suggests having less than five sessions with multiple catch-up weeks.References: 1. Cook M, Irby DM, & O'Brien BC. Education physicians: a call for reform of medical school and residency. San Francisco, CA: Jossey-Bass, 2010. 2. Cook DA & Steinert Y. Online learning for faculty development: a review of the literature. Med Teach. Sep 2013; 35 (11): 930-937. Available at http://dx.doi.org/10.3109/0142159X.2013.827328 3. Diaz V. Digital badges for professional development. EDUCAUSE Review. July 1, 2013. Available at http://er.educause.edu/articles/2013/7/digital-badges-for-professional-development

Poster F-4: The Jigsaw: an interactive Method of Peer Learning in Medical Education

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Learning Objectives: Objective 1: List the fundamentals of the jigsaw classroom Objective 2: Participate in a jigsaw teaching session Objective 3: Discuss modifications to the jigsaw method for use in graduate medical education Objective 4: Plan an educational session using the jigsaw methodMethods/Approach: In an attempt to shift from a teacher to learner-centered paradigm, peer teaching has been widely incorporated into the medical school curriculum. Research shows that peer teachers had higher United States Medical Licensing Examination (USMLE) Step 1 scores, USMLE Step 2 scores, and final medical school GPA than students who did not engage in peer teaching (Wong et al 2007). There are also additional benefits to peer teaching, including improved communication, teaching and leadership skills (Ten Cate & Durning, 2007). The jigsaw education technique (Aronson et al 1978) is a peer learning method that requires individual students to become an "expert" on one aspect of a lesson through independent learning and small group discussion, and then teach other members of their "jigsaw" group about their assigned topic. The jigsaw technique is an interactive, enjoyable method of teaching ideally suited for medical education, in which a large amount of material must be assimilated in a short period of time. The technique has been used in medical education with success in meeting learning objectives (Walker et al 2015). This workshop will be led by faculty with experience in teaching medical students and pediatric residents utilizing the jigsaw method. The session will begin with a simple needs assessment of the participants regarding interests and experiences with medical education and innovative techniques including the jigsaw technique. An overview of the jigsaw method, as well as its application and merits in medical education will follow. The first small group activity will allow participants to engage in a jigsaw educational exercise, the topic of which will be "How to plan a party." Participants will be assigned to a small jigsaw group; each member of the group will be assigned a unique article for review. They will complete a pre-test on the educational material to be taught, and read their article. They will then convene in small groups with others who reviewed the same topic (expert groups).

Following this discussion, each participant rejoins their jigsaw group to present their topic. Participants will then complete a post test and reflect on the opportunities and challenges they encountered while experiencing the jigsaw method as well as its potential use in their own settings. Leaders will discuss their own experiences with the jigsaw method in undergraduate and graduate medical education in our institution. Participants will begin to design a jigsaw activity relevant to their own teaching needs. The session will conclude with a review of the needs charted and closing discussions regarding practical implications.
References: Aronson E., Stephan C., Sikes J., Blaney N., Snapp M. 1978. The Jigsaw Classroom (Beverly Hills, California, Sage Publications). Ten Cate O., Durning, S. (2007) “Peer teaching in medical education: twelve reasons to move from theory to practice.” Medical Teacher 29 (2007): 591-598. Walker, S, Olvet, D, and Chandran, L 2015. The jigsaw technique of peer teaching and learning: An efficient and enjoyable teaching strategy in medicine MedEdPublish, doi:10.15694/mep.2015.006.0014, 6, 14. Wong J.G., Waldrep T.D., & Smith, T.G. (2007) "Formal peer-teaching in medical school improves academic performance: the MUSC supplemental instructor program." Teaching and learning in medicine 19.3: 216-220.

Poster F-5: The Creation of a Gender Neutral Educational Resource About Gender Identity, Puberty and Relationships.

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Purpose/Problem Statement: There are few educational resources available about gender identity, pubertal changes, and relationships that present these adolescent developments in a gender neutral way. For children who consider themselves to be gender creative it can be challenging to find appropriate resources to recommend to patients and families. To address this resource gap we created an educational booklet that combines resources and medical knowledge but is presented in a gender neutral way and written for younger audiences.Methods/Approach: An educational booklet was created by reviewing the literature and gathering resources from internet and print sources. Many resources offered excellent information about gender identity and the diversity of romantic relationships. However, few resources also addressed puberty or how difficult physical body changes can be when gender identity and assigned sex at birth differ. We worked to combine knowledge from various resources and present information to the particular audience of adolescents in a gender neutral manner.Results/Lessons learned: There exist some fantastic resources for gender creative youth and families but few resources present comprehensive information about pubertal changes and medical resources for youth feeling conflicted about gender identity and assigned sex at birth. For medical providers the lack of comprehensive resources makes it challenging to recommend educational resources for patients.Discussions and conclusions/Significance: n/aReflection: The creation of an educational booklet about gender identity, relationships and puberty provides a comprehensive resource for adolescents who do not identitfy with resources that present adolescent development in purely gender binary terms. This resource fills a needed educational gap by providing a resource that physicians can recommend to pateints and that medical students and physicians can use to clarify language and terms that are important to understand when providing care to gender creative youth.References: 1. "Sex, Etc. | Sex Education by Teens, for Teens." Sex, Etc. | Sex Education by Teens, for Teens. Answer, n.d. Web. 1 Nov. 2015. 2. Hill, Mel Reiff, and Jay Mays. The Gender Book. 1st ed. N.p.: Marshall House, 2013. Print. 3. Wilson, Pamela M. Our Whole Lives, Grades 7-9, Second Edition. N.p.: UUA, 2014. Print.

Poster F-6: Creating eBooks for UME and GME: early adopters' solutions for different problems

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Purpose/Problem Statement: Emerging technologies allow medical educators to create and implement their own digital learning materials with relative ease. Following the success of online learning modalities, multi-touch e-books have attracted interest as an alternative means for faculty to distribute media-rich medical education resources to learners within their institution and to a broader audience via Apple's public store. Although the easy user interface of iBooks Author enables educators to create and publish works without programming skills or local technical infrastructure, most faculty encounter difficulties to design, produce, and implement e-learning resources in medical curriculum. How to design eBooks to enable meaningful learning experiences? How to address various educational problems by implementing eBooks in learning?Methods/Approach: At NYU school of Medicine, some faculty designed e-Books that provide different learners with various subjects through diverse educational settings: 1. An "online, point of care syllabus" for "the residents and medical students in pediatric emergency department": PEM Guides "PEM (Pediatric Emergency Medicine) Guides provide the caregiver with a concise answer to the question: "how do I take care of my pediatric patient in the emergency department?" This eBook focuses on the essential diagnostic, treatment and disposition decisions. Critical information is summarized in easy to read tables. 2. A series of preparation and review materials for anatomy laboratories and classes in Undergraduate Medical Education: Virtual Prosections: The Series This eight part Virtual Prosections Series uses extensive videos of richly detailed 3D human anatomy with audio narration to guide the learners through a virtual tour of the thorax: the vertebral column, lungs and pleural cavity, the heart, and superior and posterior mediastinum. 3. A practical guide with clinical cases for radiology residents and attending physicians: Orientation to Chest MR Imaging with CT Correlation - This practical guide highlights the increasing utility of Chest MRI and its various diagnostic applications as compared to Chest CT through clinical cases that provides a useful side-by-side comparison of the utilities of CT vs. MRI in imaging of different pathology of the chest. 4. A learning tool of specific knowledge for the cardiac surgeon-in-training: TEE 101 for the Mitral Repair Surgeon This eBook demonstrates the use of trans-esophageal echocardiography (TEE) to evaluate the mitral valve (MV) using medical illustration, stills and videos. 5. A peer-reviewed learning material of key structures of the brain responsible for addiction: Neurobiology of Substance Abuse This eBook is intended to facilitate the recognition of addiction as a disease of the brain, and provide an understanding of how neurobiology research informs the treatment of addiction using case videos, computer graphics, and interactive animations.Results/Lessons learned: So far, we have the number of downloads of our eBooks that range from 100 to 650. From the deign perspective, eBooks, unlike traditional books, allow authors to include multimedia assets like videos, animations, and other interactive widgets. eBooks also enable easy updates that could communicate new evidences or recommendations more efficiently.Discussions and conclusions/Significance: Like other educational technologies, the meaningful integration of eBooks seems to be deeply linked to careful consideration of effective instructional design, strategic implementation, and proper institutional protocol.Reflection: The eBooks are published to a broader audience. Therefore it is also important to assure review process and copyright status of any contents. The effectiveness of eBooks is difficult to be measured because Apple only shares the downloads data. At NYU School of Medicine, we are evaluating students' feedback. We also plan to design more rigorous research plans to asses the educational impact of eBooks in different educational settings.References: Payne, K. F., Goodson, A. M., Tahim, A., Wharrad, H. J., & Fan, K. (2012).

Using the iBook in medical education and healthcare settings--the iBook as a reusable learning object; a report of the author's experience using iBooks Author software. Journal of Visual Communication in Medicine, 35(4), 162–9. doi:10.3109/17453054.2012.747173 Stirling, A., & Birt, J. (2014). An enriched multimedia eBook application to facilitate learning of anatomy. Anatomical Sciences Education, 7(1), 19–27. doi:10.1002/ase.1373 Van Merriënboer, J. J. G., & Sweller, J. (2010). Cognitive load theory in health professional education: design principles and strategies. Medical Education, 44(1), 85–93. http://doi.org/10.1111/j.1365-2923.2009.03498.x

Poster F-7: Teaching Strategies that Promote Learning during Family Centered Rounds: A Qualitative Study of Attending Physicians

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Purpose/Problem Statement: The purpose of this study was to determine strategies used by attending physicians to teach effectively during Family Centered Rounds. Family Centered Rounds (FCR) have become the standard model of pediatric inpatient rounds. The active participation of families on rounds presents unique challenges in teaching at the bedside. Recent studies have examined learners' attitudes and experiences while on FCR. Learners may be hesitant to actively participate due to fear of being corrected or appearing ignorant in front of patients and families. While numerous studies report the barriers of teaching during FCR, none have described specific strategies on how to meet those challenges.Methods/Approach: A qualitative descriptive study was conducted at a large tertiary care children's academic center where FCR is the rounding model for all disciplines. Semi-structured interviews were conducted with 10 attending physicians (six hospitalists and four subspecialists). These attendings were selected for their excellence in teaching during FCR by an anonymous online survey of pediatric residents. Transcripts from the audiotaped interviews were independently analyzed using qualitative methods by four researchers who then met to discuss codes and identify themes.Results/Lessons learned: While some identified teaching behaviors were common to previously reported findings, we identified 3 major themes which are specific to teaching during FCR: Promoting senior resident autonomy, maintaining situational awareness of stressors of FCR, framing expectations for learners and for families/patients. Specific strategies included: 1) Allowing for flexibility with diagnostic and/or treatment plans as long as trainees articulated appropriate thought processes and patient safety was not compromised. 2) Maintaining constant awareness of both the anxiety level of trainees while presenting in front of families as well as the body language and emotions of family members and adapting teaching methods accordingly. 3) Empowering school-age patients and family members to teach about their experience with their illness, thereby enriching the team. 4) Strategic positioning of the senior resident next to the parents to encourage presenters to address the entire team and family. 5) Attending faculty performing a "pre-huddle" with the senior resident prior to the start of rounds to clarify questions and discuss tentative plans.Discussions and conclusions/Significance: This study was the first to identify strategies to enhance learning during FCR. FCR faculty who were noted to be excellent teachers described practical, easily implemented strategies that they believe make them effective educators during rounds. These strategies may add to the repertoire of teaching behaviors that faculty may use to promote learning during FCR.Reflection: The overarching finding from our study was that the attending's ability to maintain situational awareness during FCR was critical for improving both family and trainee education. Like a quarterback who must process the constantly changing position of the other team's defense in regards to the upcoming play, attending physicians are required to process changing information during FCR, such as the nonverbal cues of family members and trainees, their emotional states, and the amount of time spent in a room. Just as a quarterback often calls an

“audible”—a play change that is made at the line of scrimmage to adjust to a changing defense—so too do successful attending physicians make adjustments during FCR in order to ensure everyone is learning.References: 1. Sisterhen LL, Blaszak RT, Woods MB, Smith CE. Defining family-centered rounds. Teach Learn Med. 2007;19(3):319-322. doi: 10.1080/10401330701366812. 2. Sandhu AK, Amin HJ, McLaughlin K, Lockyer J. Leading educationally effective family-centered bedside rounds. J Grad Med Educ. 2013;5(4):594-599. doi: 10.4300/JGME-D-13-00036.1; 10.4300/JGME-D-13-00036.1. 3. Gonzalo JD, Heist BS, Duffy BL, et al. The art of bedside rounds: A multi-center qualitative study of strategies used by experienced bedside teachers. J Gen Intern Med. 2013;28(3):412-420. http://link.springer.com/article/10.1007%2Fs11606-012-2259-2. doi: 10.1007/s11606-012-2259-2.

oster F-8: Training Internal Medicine Residents to Provide Long-Acting Reversible Contraception (LARC): An Innovative Model

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Purpose/Problem Statement: The most highly effective methods of contraception include intrauterine devices (IUDs) and arm implants, collectively designated as long-acting reversible contraception (LARC). One of the main barriers to LARC utilization is the shortage of primary care providers trained in LARC counseling and provision, especially pronounced among internists (Sridhar, Forbes et al. 2015). We know of very few internal medicine (IM) programs where LARC provision is currently taught (Pace, Dolan et al. 2015). Our objective was to demonstrate the feasibility of an innovative strategy to integrate LARC counseling and provision into an internal medicine residents’ procedures clinic.Methods/Approach: At our institution, there was no precedent for internists to provide LARC. Our innovative strategy was to integrate LARC counseling and provision into a pre-established weekly ambulatory procedures clinic held at the Center for Primary Care (CPC) that currently provides musculoskeletal and dermatological procedures, staffed by an attending familiar with LARC procedures. The CPC is part of a large academic medical center in Providence, RI and serves an urban, underserved and ethnically diverse population of 1331 patients, of whom 52% are female. Direct patient care is provided by 90 IM residents, 2 full-time nurse practitioners and 1.0 faculty FTE. Approximately one quarter of residents practice primary care upon graduation. To implement LARC provision, the faculty attending was allotted 0.1 FTE for supervising the procedures clinic one half-day per week and used additional non-compensated time to develop our LARC protocol. The following steps were required: obtaining institutional buy-in, credentialing and privileging; collaborating with LARC providers in other departments for consults and backup; ordering instruments; devising a protocol to sterilize instruments; ordering IUDs and implants and developing a workflow to maintain inventory; verifying contraception coverage by our major insurers; creating EHR-based quick-texts for documenting visits including proper billing; and writing a procedure-specific consent form and after-visit summary. Finally the attending and resident champion held LARC training sessions for team members. A separate training was held for residents and faculty interested in Nexplanon provision using the FDA-required 2.5 hour training provided by Merck.Results/Lessons learned: We plan to evaluate both resident and patient outcomes. Prior to the implementation of this strategy, there were no residents at the CPC who were trained in LARC procedures. As of October 2015, women’s health track residents are beginning to learn IUD insertion. We will assess the number of residents trained in LARC counseling and provision between 2015 and 2017. We will collect data regarding implementation of LARC in their own practices after graduation. We will also evaluate the number of patients who select to have LARC provided in our clinic and obtain qualitative data about their experience.Discussions and

conclusions/Significance: Through the creation of a sustainable practice model, our aim is to increase the number of LARC providers within internal medicine and to make LARC training more commonplace among IM residency programs. This innovative strategy to integrate LARC counseling and provision into a residents' procedures clinic was feasible but required 1 year of curriculum design and implementation as well as up-front costs of instruments and devices. By sharing our experience with other programs, we hope to decrease the barriers and time costs to other programs interested in establishing similar initiatives. We believe this will increase the number of internists capable of providing LARC thus expanding access to first-line contraception for reproductive aged women in comprehensive primary care settings.Reflection: n/aReferences: Pace, L. E., et al. (2015). Incorporating Long-acting Reversible Contraception Into Primary Care: A Training and Practice Innovation." Womens Health Issues. Sridhar, A., et al. (2015). "Knowledge and Training of Intrauterine Devices Among Primary Care Residents: Implications for Graduate Medical Education." J Grad Med Educ 7(1): 9-11.

Poster F-9: Creating a Case Report Publishing Curriculum: Overcoming Residents' Barriers to Scholarly Activity, One Step at a Time

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Purpose/Problem Statement: Literature on resident research programs has proven how institutional support, such as faculty mentoring, financial support and research rotations, can remove barriers and increase and improve resident scholarly activity. However, these programs rarely address one major issue that affects many residents, weak writing skills. In this presentation, we argue that strengthening academic writing is the most effective method to improve resident scholarly activity and will demonstrate as much using a case report writing program developed for residents.Methods/Approach: At the authors' institution, program directors were confronted with two problems: inadequate outcomes from resident scholarly activity and residents feeling burdened by the requirement, specifically because they feel it lacks institutional support. In an attempt to solve these issues, several program directors formed a faculty writing group that focuses on case reports, the publication type most familiar to residents and the one they would be most likely to write to fulfill the scholarly activity requirement. The faculty group initiated the program by providing monthly workshops/seminars dealing with various case study topics presented by a journal editor, the Chair of the Institutional Review Board (IRB) of the University and faculty and residents who have published a case report. Recently, the faculty group launched a manuscript review committee. The faculty had determined that many residents have weak writing skills, leading them to submit low quality manuscripts likely to be rejected by journal editors. The manuscript review committee therefore provided feedback in areas including literature search strategy, manuscript content and grammar and style of writing. Additional faculty were recruited for the effort, and the group is currently composed of 3 resident program directors, 6 faculty and 1 clinical librarian. Both quantitative and qualitative methods (surveys and in-depth interviews) have been used to measure residents' evaluation. Faculty-reviewers also hold a meeting every month to evaluate the educational outcomes. Longitudinal outcomes (e.g. increase in the number of resident conference presentations and publications) will be measured to compare with pre-curriculum development. Additional data such as workshop attendance, the number of manuscripts submitted to the faculty review committee, and usage of workshop materials including presentation recordings and PowerPoint slides will also be gathered.Results/Lessons learned: The response to the workshops/seminars has been overwhelmingly positive, as shown via high attendance rates, attendees' usage of the presentation materials and survey feedback. The survey results also demonstrate the residents' appreciation of the efforts being made by the

Office of Graduate Medical Education (GME).Discussions and conclusions/Significance: n/aReflection: The underlying strength of this program's method lies in that it tackles the core challenge facing many residents, a need for enhanced writing skills. The program can also be easily adopted by other institutions since it does not require any funding. Another unexpected positive was that this program has provided a collaborative space for the residents and faculty to work together. The primary limitation is the issue of sustainability. While the voluntary commitment by many is a strength, it is also a weakness in that it may be fleeting and the program is not considered official at this time.References: DeHaven, M. J., Wilson, G. R., & O'Connor-Kettlestrings, P. (1998). Creating a research culture: What we can learn from residencies that are successful in research. Family Medicine, 30(7), 501-507. Rothberg, M. B., Kleppel, R., Friderici, J. L., & Hinchey, K. (2014). Implementing a resident research program to overcome barriers to resident research. Academic Medicine: Journal of the Association of American Medical Colleges, 89(8), 1133-1139. Durning, S.J., Cation, L.J., Ender, P.T. and Gutierrez-Nunez, J. J. (2004). A resident research director can improve internal medicine resident research productivity. Teaching and Learning in Medicine, 16 (3), 279-283.

Poster F-10: A Sex and Gender Toolkit for Emergency Medicine Residency Educators

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Purpose/Problem Statement: The significant impact of sex and gender on health and disease has become increasingly recognized over the past few decades. Recently, Emergency Medicine (EM) acknowledged the influence of sex and gender with its 2014 Academic Emergency Medicine Consensus Conference on "Gender-Specific Research in Emergency Care" and its development of a Society for Academic Emergency Medicine Sex and Gender in Emergency Medicine (SGEM) Interest Group. Despite this focus on determining how patients' sex and gender can affect their care in Emergency Departments (ED), there is currently a dearth of residency instruction on how to translate emerging SGEM data into patient care (Ashurst et al, 2014). This educational gap is especially problematic given that EM residents are perhaps best poised to pioneer changes in clinical practice based on SGEM.Methods/Approach: We propose developing a free online toolkit that will provide EM residency educators with novel strategies to incorporate SGEM knowledge into their existing curricula. In particular, the toolkit will provide tangible resources that educators can utilize in their current didactic programming as well as opportunities for innovation in both local curriculum development and the field of SGEM.Results/Lessons learned: The SGEM toolkit will include a diverse and comprehensive set of educational resources for EM residency educators. The toolkit will incorporate a variety of existing sex- and gender-based medicine educational tools with a focus on emergency care such as slides sets, video lectures, and cases for small group discussion and simulation; these can all be adapted by educators for use in their current curricula. Additionally, the toolkit will compile landmark SGEM articles that educators can then use in preparing residency didactics. The toolkit will also provide instruction on utilizing a validated PubMed search tool to identify sex and gender research in the EM literature. This search tool will allow educators to keep their SGEM educational materials up-to-date and fill in gaps that they perceive in their own knowledge base. Finally, the toolkit will highlight existing shortcomings in the field of SGEM in order to identify opportunities for both educators and learners to advance knowledge in this field. Pre- and post-testing, when feasible, will be linked with the utilization of the SGEM toolkit to evaluate its efficacy.Discussions and conclusions/Significance: While increasing attention has been devoted to the impact of sex and gender on health and disease of late, there remains a need to translate the emerging knowledge on this topic into superior clinical care. Residency

education represents a key strategy in bridging this gap between knowledge and practice. The SGEM toolkit has the potential to become a dynamic, innovative supplement to existing EM residency educational materials as well as ultimately improve emergency care delivery.Reflection: N/AReferences: Ashurst JV, McGregor AJ, Safdar B, Weaver KR, Quinn SM, Rosenau AM, Goyke TE, Roth KR, Greenberg MR. Emergency Medicine gender-specific education. Acad Emerg Med. 2014;21:1453-1458.

Poster F-11: Development and Validation of a New Tool to Assess Knowledge and Skills in Evidence-based Medicine

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Purpose/Problem Statement: We report on work in progress to develop and validate a practical curricular test for evidence-based medicine knowledge and skills. The project is a joint collaboration between Penn State College of Medicine and Rutgers, Robert Wood Johnson Medical School and is funded by the North East Group on Educational Affairs (NEGEA). This research has received IRB approval at both institutions. Evidence-based medicine (EBM) refers to medical practice that uses the best, current evidence to inform decision-making. Medical schools are charged by accrediting bodies to ensure graduates are prepared to practice EBM, which includes basic knowledge of statistical tests and research design, as well as application of evidence into clinical decision-making. There is currently no validated, comprehensive and practical tool for measuring EBM knowledge and skills. Several evaluative tools of EBM have been described (Shaneyfelt et al., 2006) but these do not cover the breadth of content and the need for practicality that clinical educational programs need. The two most used, validated EBM testing tools are the Fresno test (Ramos, Schafer, & Tracz, 2003) and the Berlin test (Fritsche, Greenhalgh, Falck-Ytter, Neumayer, & Kunz, 2002). The Fresno test covers many of the domains of EBM, but it is limited by the use of open-ended questions that require grading by trained raters, thus making it time-consuming and impractical for large numbers of learners. The Berlin test is a multiple-choice question (MCQ) test that focuses on knowledge and data interpretation, without covering the complete content of interest to undergraduate educators. The Berlin test is also a fairly high-level test, so it is not well-suited for undergraduate competencies. We aim to develop a new test that is reliable, valid, efficient and appropriate for undergraduate medical students.Methods/Approach: Test development: Several meetings were held with the joint authors. We created a list of EBM domains to be included in the test. We then wrote, reviewed, and revised questions within each of these domains. Questions were also reviewed with respect to cognitive domains as defined by Bloom's taxonomy. Psychometrics: The instrument was reviewed by an expert in psychometric and test items were revised based on feedback. Content Validity: Several EBM content experts reviewed the test for content validity. Discriminative Validity Pilot test: The test was piloted using a small group of first and second year medical students (beginners and intermediate learners, respectively) and practicing physicians who were self-identified experts in EBM. This phase enabled estimation of time needed to test, the sample size needed to achieve discrimination validity, and the level of difficulty of items.Results/Lessons learned: Test development: We identified the following EBM domains (with proportional allocation): seeking appropriate resources (20%) critical appraisal (30%) statistical competency (40%) application and interpretation (10%) The new test includes 15 questions. Topics include component skills including identifying appropriate outcomes of interest, knowledge of information resources, identifying risk of bias, application of diagnostic statistics, and applying knowledge of effect sizes. Questions utilized scenarios that are straightforward enough for first-year students to understand without having medical knowledge. Content validity and discriminative validity pilot testing results will be provided within the

poster.Discussions and conclusions/Significance: We report on the status of this project to develop and validate a test of EBM knowledge and skills. We also describe the next phases of the project, which include discriminative and responsiveness validity.Reflection: Creating and validating an assessment instrument is a multi-step, time-consuming process, but we believe that the outcomes of this project will be a useful instrument for medical educators.References: Fritsche, L., Greenhalgh, T., Falck-Ytter, Y., Neumayer, H., & Kunz, R. (2002). Do short courses in evidence based medicine improve knowledge and skills? Validation of Berlin questionnaire and before and after study of courses in evidence based medicine. BMJ, 325(7376), 1338-1341. Ramos, K. D., Schafer, S., & Tracz, S. M. (2003). Validation of the Fresno test of competence in evidence based medicine. BMJ, 326(7384), 319-321. Shaneyfelt, T., Baum, K. D., Bell, D., Feldstein, D., Houston, T. K., Kaatz, S., . . . Green, M. (2006). Instruments for evaluating education in evidence-based practice - A systematic review. Jama-Journal of the American Medical Association, 296(9), 1116-1127.

Poster F-12: If they're sleeping they're not learning: Resident conference presentations and TBL behaviors

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Purpose/Problem Statement: Problem Statement: Medical educators place a high priority on the transition from passive classroom experiences to active "flipped classroom" techniques such as team-based learning (TBL). Faculty development to transition to these techniques is difficult. An easy-to-use teaching session observation tool delineating TBL behaviors may help program and course directors know whether or not they have achieved their faculty development objectives.Methods/Approach: Approach: We developed a resident conference observation form consisting of 11 TBL-related faculty behaviors emphasized in the literature (1,2), graded on a 0-1-2 scale (not done, partially done, and done; described with behavioral anchors). Additional items assessed the number of learners who "fell asleep, example – appeared to be dozing" or who "appeared non-engaged for much of session, example – texting, complete lack of eye contact". Internal medicine faculty delivering clinical noon conference sessions to residents were emailed a 4-page description of TBL and were invited to a 1-hour faculty development session in TBL techniques. Chief residents and future chief residents attending a convenience sample of noon conferences filled out the observation forms. The PI briefly oriented the observers to the form before their first use; observers were blinded as to which faculty members had attended the faculty development sessions.Results/Lessons learned: Lessons learned: The possible range of TBL behavior scores on the observation form was 0 (a non-interactive lecture on a subject completely new to the residents) to 22 (all TBL behaviors done). For the entire sample of 62 observations, scores ranged from 0 to 14, with a median of 5 and a mode of 2. For the 16 observations of presentations done by a faculty member after attending TBL faculty development, scores ranged from 0 to 12, with a median of 8 and a mode of 10. Importantly, it was noted that there was a very strong negative correlation between the composite TBL behavior score and the primary outcome, the percentage of learners who fell asleep during the session ($\beta 1 = -.00922$, SE .00223; 95% CI -.01367, -.00477; $p < 0.001$). In other words, a higher score for TBL behaviors by a faculty member was correlated with a smaller percentage of learners falling asleep during their session. Our chief residents did not find the observation form difficult or time-consuming to fill out. The percentage of invited faculty attending the faculty development sessions was 28% (18/64), 16 during the first year and 2 during the second year.Discussions and conclusions/Significance: Significance: This negative correlation between

faculty TBL-style behaviors and learner sleeping during the session should spur us to make greater efforts to change our faculty's mode of delivery of resident conferences. We are not aware of any other easy-to-use observation form quantifying the degree to which a teaching session follows TBL-prescribed behaviors; this form could be used to provide feedback to faculty. Further studies should examine the reproducibility of the observations across multiple observers of the same session. Other hypotheses could be pursued using this form. We plan a multi-variable analysis of the data, to see which TBL behaviors are associated with the largest decreases in learner sleeping and inattention.Reflection: NAReferences: 1. Haidet P, Levine RE, Parmelee DX, et al.Guidelines for reporting team-based learning activities in the medical and health sciences education literature.Acad Med 2012;87:292-99. 2. Burgess AW, McGregor DM, Mellis CM.Applying established guidelines to team-based learning programs in medical schools:A systematic review.Acad Med 2014;89:678-88.

Poster F-13: Assessing EPA Readiness

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Purpose/Problem Statement: In November 2013, The AAMC released a document outlining 13 EPAs that all graduating medical students should be able to achieve before the start of residency. Since then, many schools have tried to focus on assesing and teaching these EPAs so that a graduating medical student will be prepared to enter residency. Since 2011, SUNY Downstate College of Medicine has offered a residency readiness elective for students entering surgical specialties. When the AAMC presented the EPAs in November 2013, the course was redesigned. The purpose fo the project is to teach all of the EPAs and to determine what impact it had on future resident performance.Methods/Approach: 48 students have taken the elective. For EPAs#1 & 2, students practice gathering basic information; for EPA#3, students interpret tests including CBC, Chemistry and Coagulation Profile and they examine screening guidelines such as mammograms and colonoscopy; for EPA#4, students write prescriptions and learn about common mistakes; for EPA#5 and 6, students interview a simulated patient, present the patient and write a note; for EPA#7, students complete an EBM exercise; for EPAs#8 and 9, students learn about TeamSTEPPS including IPASS; for EPA#10, computer based simulations demonstrate common surgical emergencies; for EPA#11, students practice obtaining an informed consent; for EPA#12, students practice suturing, knot tying, foley placement and basic laparoscopy; for EPA#13, students learn about a fishbone diagram. Pre and post tests are used to evaluate knowledge and checklists for the skills.Results/Lessons learned: While the students didn't do well on pretests, they all did better on the post test. This was not due to new information acquired but they were just refreshing their memory. This elective is given post-match and the time commitment was 4 hours daily. The elective is well received by students however surprising results came through follow-up surveys. The majority of the students (90%) felt better prepared than fellow residents in July. However 95% felt that this effect only lasted 2-4 months and then afterwards everyone was on an even playing field.Discussions and conclusions/Significance: N/AReflection: The elective in general has been considered a sucess in that each it has been offered, it has always been oversubscrbed. Every year, students have to be turned away. But the overall value of the elective is questionable. Is it worth having extra preparation before intern year starts if the effect is only going to last a few months? That is the question we are currently trying to solve.References: 1. www.aamc.org/cepaer 2. Chen HC, van den Broek WE, ten Cate O. The case for use of entrustable professional activities in undergraduate medical education. Acad Med. 2015 Apr;90(4):431-6. 3. El-Haddad C, Damodaran A, McNeil HP, Hu W. The ABCs of EPAs - an overview of 'Entrustable Professional Activities' in medical education. Intern Med J. 2015 Sep 19.

Poster F-14: Clerkship EPAs--Can they be done?

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Purpose/Problem Statement: The AAMC released the Core Entrustable Professional Activities document for Entering Residency in November 2013. This document outlines the EPAs that all graduating medical students should achieve before entering residency. However when should they be specifically taught in the curriculum? Many of the EPAs pertain to clinical activities. Intuitively, teaching them througout the clincal clerkships seems to be the best place to add this to the curriculum. However each clerkship is only a few weeks in length. The purpose of this project is to see if a few selected EPAs can be achieved during the Ob/Gyn core clerkship.Methods/Approach: Specific EPAs were selected as a focus. History, Physical, Differential Diagnosis and Oral Presentation were selected. For the EPA pertaining to simple procedures that all students should be able to do, 3 procedures were selected: IV placement; Phlebotomy; and Foley Placement. Miller's Pyramid was chosen as a way to show developing competence. The students had 5 levels to achieve the EPA: Knows; Knows How; Shows How; Does;and Trustable. Both the residents involved in the project as well the Ob/Gyn clerkship students were given information about the EPAs and how to see if the student has progressed. It was stressed to the students and residents that the results of the study would not impact on the student's grades in any fashion. The residents were to judge if the student advanced to the next level or not.Results/Lessons learned: The study is currently ongoing. However, it has become clear that the hardest part is to ensure clear level setting between the residents. Also as this is not attached to any grade, sometimes the students forget to get the EPA form filled out.Discussions and conclusions/Significance: N/AReflection: We don't expect any student to be Trustable" after 6 weeks. However the possibility of achieving a level of 'Does' is very possible. However, the student may become proficient for an Ob/Gyn History and then move on to Psychiatry which has a different focus for the history. In essence, the student is almost starting all over again at the beginning of each clerkship. Is it important that the student becomes proficient in the various forms of the History that may pertain to each field or is it suffient that they only know the bare basics? Once the match results are in, does the student need to be re-trained focusing only on the specialty to which the student matched?References: 1. ww.aamc.org/cepaer 2. Chen HC, McNamara M, Teherani A, Cate OT, O'Sullivan P. Developing Entrustable Professional Activities for Entry Into Clerkship. . Acad Med. 2015 Nov 9. 3. Chen HC, van den Broek WE, ten Cate O. The case for use of entrustable professional activities in undergraduate medical education. Acad Med. 2015 Apr;90(4):431-6.

Poster F-15: Learned-Centered Quality Improvement Projects: Improving Resident Learning and Patient Care

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Purpose/Problem Statement: The Accreditation Council for Graduate Medical Education (ACGME) recently created competency-based developmental outcomes termed milestones. These learning outcomes are divided into developmental levels. Each milestone contains five developmental levels, with level four being the desired learning outcome by graduation from residency. Included in these milestones is that residents should understand systems-based practices. To achieve a level five in the neurology milestone entitled, “Systems thinking, including cost and risk effective practice”, a resident should be engaged in scholarly activity1.

With the goal of a level five understanding in delivery of quality care, this study examines a neurology resident driven quality improvement (QI) project utilizing action research. This learner-centered inquiry positions the researcher as an active participant in the study. The framework of action research is an inquiry process that is iterative and involves three stages: reflecting, acting, and evaluating. This inquiry process involves the residents actively learning, participating, documenting, and enacting change in the research endeavor. Prior studies illustrate the importance of involving residents in QI projects that benefits both patients and residents2,3.Methods/Approach: 18 neurology residents from one program in Boston, MA, brainstormed various QI projects. Discharge from the inpatient stroke service was noted to be an error rich critical healthcare transition. The residents chose to design and implement a checklist to use at discharge from the hospital, which followed the 'Get With The Guidelines' stroke requirements. Development of the checklist came from residents' lived experiences, stroke nurse input, and attending physicians. Collaboratively crafting the checklist functioned as a rich learning opportunity for residents. Reviews of pre and post implementation medical records found fewer modifications to the discharge summaries after utilizing a checklist. Furthermore, residents and attending were asked in survey format to evaluate the use of the checklist and experiences and responses were favorable. All 18 residents participated in the checklist use and were able to be a part of the QI project implementation. These data were then presented as a poster at the American Academy of Neurology annual meeting in 2014 as an example of a successful resident driven quality improvement project.Results/Lessons learned: Embracing a learner-centered inquiry approach like action research enables residents to learn through self-reflection, data analysis, action, and evaluation. This inquiry approach fosters learning through enacting change focused on important quality issues. In this study, residents reported they found the experience and checklist useful and were able to experience the impact on patients. Overall, this QI project assisted residents with meeting level five milestone system-based learning.Discussions and conclusions/Significance: Reflecting on QI as a catalyst for resident learning as well as for improving patient care is beneficial for meeting ACGME milestones. Action QI research enables residents to develop a rich understanding of QI, while participating in scholarship. Learner-centered medical education is a crucial way to help residents meet milestones. Other studies have discussed benefits of similar resident driven QI projects, but not through the understanding of learner-centered education2,3. Using action research in resident QI projects allows residents to learn the material and reach a level five in their systems based milestones while positively impacting patient care.Reflection: n/aReferences: 1. www.acgme.org/acgmeweb/Portals/0PDFs/Milestones/NeurologyMilestones.pdf. Accessed 11/11/2015. 2. Duello K, Louh I, Greig H, Dawson N. "Residents' knowledge of quality improvement: the impact of using a group project curriculum" Journal of Postgraduate Medicine. 2015; 91: 431-435. 3. Liao J, Co J, Kachalia A. "Providing Educational Content and Context for Training the Next Generation of Physicians in Quality Improvement". Academic Medicine 2015; 90: 1241-1245.

Poster F-16: Excellence in Communication and Emergency Leadership (ExCEL): A Simulation-Based Curriculum for Pediatric Residents

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Purpose/Problem Statement: Pediatric residents are often the first responders to pediatric resuscitations and must efficiently and effectively manage multidisciplinary teams caring for critically ill patients. Residents receive Pediatric Advanced Life Support (PALS) training at the start of their residency and a refresher two years later; however, research has demonstrated that skills and confidence decline quickly over time.1 Currently, residents receive limited in-depth instruction and ongoing maintenance of the skills founded in PALS. The ExCEL curriculum was developed to address these concerns, with a goal to replace standard “morning report” didactics with simulation-based training twice monthly. Data from unannounced multidisciplinary in situ pediatric mock resuscitations at our institution identified specific areas for improvement including: team leadership and communication skills, timely and accurate rhythm recognition for patients in cardiac arrest, and performance of quality cardiopulmonary resuscitation. The ExCEL curriculum aims to augment and support the skills initially acquired during PALS courses while helping residents gain confidence, sharpen and maintain critical technical skills, and improve leadership and communication proficiency.Methods/Approach: This novel curriculum was developed and implemented at our institution in July of 2015 and combines high-fidelity simulation and small group learning opportunities for pediatric, medicine-pediatrics, and triple board residents (PGY 1-4) two times per month. Simulation of pediatric cardiac arrest cases focus on teamwork, medical management, and procedural skills using rapid-cycle deliberate practice and debriefing. This process allows for immediate direct feedback and an opportunity for the learners to “try again” until successful.2 The small group sessions incorporate case-based learning, active commitment exercises, and hands-on practice of technical skills including, but not limited to airway skills, cardiopulmonary resuscitation/quality chest compressions, and use of defibrillators.Results/Lessons learned: Preliminary findings reveal that participating residents demonstrate increased confidence in both clinical decision-making and procedural skills, including airway management and cardiopulmonary resuscitation, during unannounced mock resuscitations. They show increased comfort with team leadership and communication during these simulations, and report the same during true pediatric resuscitations. Future areas for improvement include less emphasis on the management of patients with pulseless cardiac arrest and more opportunities for education on the management of critically ill patients with a variety of medical complaints.Discussions and conclusions/Significance: The ExCEL curriculum utilizes various educational strategies to improve the engagement and education of our adult learners. Preliminary findings show that this ongoing simulation and case-based training, as a supplement to initial PALS training, can improve resident performance including critical communication and leadership skills. Preliminary data also demonstrate improvement in critical actions during pediatric mock resuscitations. Additional quantitative and qualitative data from both mock and actual pediatric resuscitations are currently being reviewed to further assess and optimize this curriculum.Reflection: n/aReferences: 1. Braun L, et al. Retention of pediatric resuscitation performance after a simulation-based mastery learning session: a multicenter randomized trial.Cut Pediatr Crit Care Med. 2015 Feb;16(2):131-8. 2. Hunt EA, et al. Pediatric resident resuscitation skills improve after “rapid cycle deliberate practice training. Resuscitation. 2014 Jul;85(7):945-51 3. Donoghue AJ, Durbin DR, Nadel FM, Stryjewski GR, Kost SI, Nadkarni VM: Effect of high-fidelity simulation on Pediatric Advanced Life Support training in pediatric house staff: a randomized trial. Pediatr Emerg Care 2009, 25(3):139-144 "

Poster F-17: Utilizing Standardized Direct Observational Sessions to Introduce and Instruct Professional Identity

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Purpose/Problem Statement: Problem statement: Instruction and measurement of Professional Identity (PI) is a challenging and vital component of medical education. Novel techniques are needed to introduce the development of PI into the early years of residency training. In this session, we will introduce our novel teaching modality of utilizing standardized observation to teach PI.Methods/Approach: Approach: Utilizing a unique instructional modality of standardized direct observation teaching (SDOT), we introduce and teach early formation of PI. SDOT sessions are performed for interns and second year residents in our residency program. The session runs as follows: a brief introduction on PI is given; next, utilizing one-one-one mentorship and coaching in a proactive style, direct observation occurs; using Entrustable Professional Activities (EPA) as our assessment tool, feedback is provided; finally, self-reflection on PI formation caps off the session. The goal of this program is both formative and summative feedback, ultimately encouraging early PI formation.Results/Lessons learned: SDOT SESSION - see attached for diagramDiscussions and conclusions/Significance: n/aReflection: Significance: The importance of a well-developed PI cannot be understated; a well-developed PI contributes to physician well-being and satisfaction, helps to maintain altruism and service orientation and counteracts burnout.1 Developing techniques for the instruction of PI is key to the education of our residents, and should be a stated goal of graduate medical education.2,3 Creating ways to maintain the development of PI throughout longitudinal instruction during residency and beyond is a crucial future direction for this program.References: References 1. Holden M, Buck E, Luk J et al. Professional identity formation: Creating a longitudinal framework through TIME (transformation in medical education). Acad Med. 2015;90(6):761-7. 2. Cruess R, Cruess S, Boudreau D et al. Reframing Medical Education to Support Professional Identity Formation. Academic Medicine. 2014;89:1446-1451. 3. Wald H. Professional Identity (Trans)Formation in Medical Education: Reflection, Relationship, Resilience. Acad Med. 2015;90(6)1-6.

Poster F-18: Pre-Clinical and Clinical Student Designed Electives in Undergraduate Medical Education

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Purpose/Problem Statement: Medical school education has traditionally been describes as a 4-year training focusing on basic science and clinical education, medical schools have continually explored opportunities to innovate medical education. The Liaison Committee on Medical Education currently requires opportunities for students to participate in electives, but does not mandate any specific format.1 Electives play an important role in allowing students to explore educational opportunities that enhance the traditional curricula; teaching students clinical skills, wellness and coping techniques, as well as helping students make more informed career decisions.2 Nevertheless, as not all interests are met by pre-designed electives, students have increasingly been turning to self-designed educational opportunities. While departmental sponsors design many electives, students often have specific interests that are not met by existing electives designed by faculty. The University of Massachusetts Medical School (UMMS) has developed two options for students to design their own educational opportunities: Optional Enrichment Electives (OEEs) aimed at first and second year students and Flexible Clinical

Electives (FCEs) aimed at students on clinical rotations. The goal of this innovation is to allow students to explore topic areas outside the preset curriculum in order to both increase student satisfaction and allow them to make more informed choices about their future careers in medicine.Methods/Approach: UMMS offers opportunities for students to design electives at all phases of their medical education. As first and second year students, OEEs are available for students to explore their interests. When a need is not met, students may design their own elective with faculty sponsorship and approval from the Educational Policy Committee. During clinical years, students may design their own FCEs in one of three areas: Administrative, Clinical, or Research. These courses are sponsored by a faculty member and allow students to spend a week immersed in a topic area of their choice. Evaluations are sent to all students receiving credit for either an FCE or OEE.Results/Lessons learned: During 2012-2014 212 students participated in 760 FCEs. Students had the opportunity to design their own FCEs and 121 total (15.9%) self-designed FCEs were created. 84 Students (39.6%) participated in at least 1 self-designed FCE. 28 Students (33% of FCE participants) participated in multiple self-designed FCEs. 33 students had submitted qualitative feedback that reported an overwhelmingly positive experience. Preliminary data from the class of 2016 demonstrates that 242 OEE classes were taken for credit over their 4 years of medical school. These students have reported qualitative feedback suggesting that their experiences were positive and had a role in guiding their clinical experiences and FCE selections.Discussions and conclusions/Significance: The autonomy of self-design curricula has granted medical students the freedom to explore areas outside the traditional curricula such as leadership in a healthcare setting, research, ethics, and sub-specialty medicine. The positive feedback suggests that the ability for a student to design their own electives tailored to their educational interests is not only well received, but allows students more flexibility in exploring their career path than predesigned electives.Reflection: The results are limited to enrollment numbers and participation in self designed electives. Future initiatives will look to implement and analyze the efficacy of teaching a new leadership OEE focused on leadership within the healthcare team as well as look at the impact of both OEEs and FCEs on future career choices.References: 1. Agarwal, Ankit, et al. Elective courses for medical students during the preclinical curriculum: a systematic review and evaluation." Medical Education Online (2015): v20. 2. Liason Committee on Medical Education. "The Functions and Structure of a Medical School: Standards for Accreditation of Medical Education Programs Leading to the M.D. Degree." 2013.

Poster F-19: Utilizing checklists for pre-rounding: a model for building efficiency and accuracy among new learners.

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Purpose/Problem Statement: In the health care setting, checklists have received recent news for their ability to streamline tasks and processes while reducing error and increasing patient safety. One area in medical education where a systematic process is lacking is in the area of teaching pre-rounding to a new learner beginning their clinical years. The transition between pre-clinical and clinical years is often challenging for students as it leaps from theoretical to practical knowledge. Many curricula incorporate a form of orientation process between these years, but in reality students continue to feel lost with regards to collecting information sufficient for presenting on rounds. While the pre-clinical years focus on teaching students to become data collectors, pre-rounding requires a more sophisticated understanding of data in order to present relevant information to the team. Furthermore, differing styles of different teams and attending physicians makes it difficult for new learners to create a data collection system and to practice it consistently. Because of these challenges, many students find pre-rounding to be a

daunting task.Methods/Approach: To remedy this knowledge gap and increase confidence, we introduced a standardized checklist for pre-rounding with which third and fourth year medical students can efficiently and comprehensively gather the pertinent data about their patients to present on rounds. The checklist may be used as a backbone for future presentations, and is amenable to modification depending on the specific needs of the team they are rotating with. This intervention is one component of a larger, two-hour interactive teaching session on the role of checklists in health care, how to collect data using an electronic medical record and a paper record, and the overall structure of presenting a patient. At the conclusion of the session, students left with a checklist and presentation outline to keep with them on the floors.Results/Lessons learned: In organizing and executing this session, we found that students valued the role of a checklist and were well-versed in their utility in health care. They also expressed a desire for more opportunities to practice presenting a patient in low-stakes settings. Students agreed that they envisioned using the checklist on multiple rotations, including internal medicine, surgery, pediatrics, and obstetrics.Discussions and conclusions/Significance: In the future, we hope to expand this session to teaching a greater number of students at a time, while maintaining the interactive quality of the session. We also would like to consider incorporating the checklist into formal curriculum during third year orientation week at the start of the pre-clinical years. Additionally, this project holds larger implications for the utility of checklists within undergraduate medical education, as the existing literature of checklists in health care is largely focused on the intensive care unit.Reflection: For third year medical students, the combination of a concrete tool for use on the floors coupled with an interactive session is critical to providing a necessary structure to the clinical years. A format such as this allows students to safely practice a new skill, with the ultimate goal of becoming efficient residents and providers in the future.References: Patient Safety Primer: Checklists. AHRQ. August 2014. https://psnet.ahrq.gov/primers/primer/14. Godefrooij, MB, et al. Students' perceptions about the transition to the clinical phase of a medical curriculum with preclinical patient contacts; a focus group study. BMC Medical Education 2010, 10:28 . < http://www.biomedcentral.com/1472-6920/10/28> Gawande, Atul. The Checklist. The New Yorker: Annals of Medicine. 2007 December 10.

Poster F-20: Integration of Basic Science and Clinical Medicine: A Course Model for Clinical Curriculum

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Purpose/Problem Statement: Advances in medical education have led to increased interest of the integration of basic science and clinical medicine within curriculum. Existing literature supports this type of integration and provides a theoretical framework. However, there are no current suggestions for best practice of the implementation of this type of curricular innovation. The process of basic science and clinical integration requires a large effort in planning, communication, coordination, and time from faculty involved in course development and implementation. 1,2 For cognitive integration learning to occur, curricular innovations should activate student critical thinking, and interweave basic science with clinical medicine concepts.1-3 At the Penn State College of Medicine, we designed and implemented a course to meet our need for more basic science integration within the clinical years. This continues to be an innovative and progressive course, which is now in its second year.Methods/Approach: The Integrated Sciences Course is congruent with third year clinical clerkships, and includes 24 topic sessions, each 4 hours long. Each topic session includes approximately 30-40 students, and is offered 4 times per year within its congruent clerkship block. This was expanded from only 8

topic sessions during the first course year. Interactive educational methods are used for advanced problem solving using basic science concepts and critical thinking. A humanities thread is incorporated through facilitated small group discussions for the first hour of each session, prior to clinical case discussion. Session topics are selected based upon curricular needs, using both new material and purposeful redundancy to accentuate the use of basic science knowledge in clinical problem solving. Basic science and clinical faculty partner to create session materials. Student assessments include short multiple choice quizzes following the majority of sessions. The sessions are continually evaluated by students and faculty for quality and improvement. We plan for continued progression of the course with eventual expansion of up to 40 sessions per year.Results/Lessons learned: Expansion of the number of topic sessions has created scheduling consistency for students, which has improved student perception of the course. Students enjoy cases that have common clinical significance rather than rare clinical scenarios. Faculty must understand course goals and session objectives for effective facilitation of student learning and critical thinking. Significant work in faculty development is necessary for session material creation and a facilitator guide is imperative. Interactive educational methods may be new ways of teaching for some faculty. We have been developing faculty teaching methods through individual and small group meetings, however, more efficient and effective faculty development is required. Additionally, higher order assessments, beyond current multiple choice exams, are needed to address the critical thinking aspect of course objectives. We are designing a critical thinking assessment using student created cases, which involves student developed case materials that integrate basic sciences with relevant clinical problems encountered during clerkship experiences.Discussions and conclusions/Significance: We have successfully initiated an innovative course with the objective to use basic science and critical thinking for advanced clinical problem solving within the clinical curriculum. This is a work in progress, with many opportunities for refinement based upon student and faculty evaluations. As suggested by Harden's Integration Ladder, the implementation of an integrated curriculum is a step-wise evolutionary process, and our ultimate goal is to achieve trans-disciplinary integration within the mind of the learner.1 We have created a course design framework for the integration of basic science and clinical curriculum, which will be expanded through further work in faculty development and assessments.Reflection: N/AReferences: 1. Hartman, R. M. "The Integration Ladder:A Tool for Curriculum Planning and Evaluation." Med Educ 2000;34:551-7. 2. Goldman, E. and W.S. Schroth, "Deconstructing Integration: A Framework for the Rational Application of Integration as a Guiding Curricular Strategy." Acad Med 2012;87:1-6. 3. Kulasegaram, K. M. and M. A. Martimianakis, et al. "Cognition Before Curriculum:Rethinking the Integration of Basic Science and Clinical Learning." Acad Med2013;88:1578-85.

Poster F-21: Impact of early medical school experiences on eventual career choices

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Purpose/Problem Statement: The University of Massachusetts Medical School (UMMS) third year curriculum now requires students to participate in four week-long electives of their choice. An objective of this program is to provide the opportunity to explore career options and interests. The purpose of this study is to evaluate the impact of these early electives relative to other curricular experiences in guiding career choice.Methods/Approach: Three surveys were administered to various student populations to assess the perceived importance of the third year electives versus other learning opportunities with regards to the final career choice. Survey data was drawn from MS1 – MS4 students, across four class cohorts (2014, 2016, 2018, 2019). In addition, final career choice as judged from residency match data was correlated to third year

elective selections. Survey Cohorts Survey 1: n = 52 MS4 already matched to residency (Class of 2014) Survey 2: n = 135 preclinical students (65 MS1, 70 MS2) (Classes of 2018 & 2019) Survey 3: n = 115 rising MS4 (Class of 2016)Results/Lessons learned: Survey Response Summary Survey 1 was a retrospective survey of those who had already matched to a residency. Students opined the 4th year electives are most important for career selection (65%), followed by 3rd year core clerkship experiences (63%) and 3rd year electives (37%). When pursuing a career in a specialty not offered in the core curriculum, 3rd year electives assumed greater importance (57%). 53% and 63% of students in Survey 1 and 3, respectively, report that early 3rd year electives veered them away from a specialty in which they previously had interest. In Survey 2, only 7% of preclinical students were sure of their career plans; 16% were completely undecided. 98% of preclinical students anticipated early third year electives would help in career planning Survey 3 revealed 3rd year experiences are helpful in career planning (97%), reaffirmed prior career plan (86%), and sparked interest in a new field (55%). Residency Match Correlation Residency match data for graduating classes 2014 and 2015 (n = 208) were compared to completed 3rd year elective experiences. 74% completed one or more early electives in the specialty of the residency match. Primary care residencies were most popular, but demonstrated a weak correlation with 3rd year elective choices. On the other hand, subspecialty residency matches show a strong correlation with early electives in the same field. 70% of students who do 3rd year medical subspecialty electives match to medicine residencies; 50% of those who did a surgical early elective matched to a surgical residency. Student-designed early electives predict residency choice and match to a greater degree than electives offered by faculty.Discussions and conclusions/Significance: Early electives in the third year of the curriculum play an important role in career choice, including informing the decision to not pursue a particular field of medicine, and guiding choice of fourth year electives which seem to be very important in eventual career choice. Subspecialty third year electives in topics not offered in the core curriculum, especially in surgery, are important in helping career choice. When given the opportunity to design their own early electives, students design experiences that tend to play a significant role in career choice. One limitation is the surveys were not longitudinally applied to the same cohort across the years to assess their changing perceptions of the relative impact of different medical school experiences on eventual career choice. Also, data beyond the residency match to ascertain the final career path was unavailable to us.Reflection: n/aReferences: Li K, Burnham C, Malkani S (2015). Flexible Clinical Experiences: Analyzing student elective enrollment in the third year and career choices. Presented at University of Massachusetts Medical School Summer Research Symposium. Worcester MA. Perry D, Burnham C, Hatem D, Vigeant D, Cahan M, Malkani S (2015). Flexible elective time during medical school year three for exploring career opportunities including surgical specialties. Presented at AAMC 2015 Northeast Group on Educational Affairs (NEGEA) Annual Retreat. Worcester MA.

Poster F-22: Why do we invest in diversity?

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Purpose/Problem Statement: While the Patient Protection and Affordable Care Act expanded healthcare access for more Americans, vulnerable populations still lag behind as a result of social and cultural disparities. It is therefore imperative that a more inclusive and diverse model of medical education be implemented to stimulate cultural competence in the healthcare system and strengthen community-level approaches to improving healthcare for all. This paper describes key strategies led by the Sophie Davis School to improve the diversity and cultural competence of the healthcare workforce, and offers a rationale for increasing healthcare

equity.Methods/Approach: Data from a mixed-methods study of 1,524 graduates between 1977 and 2005 provide a multifaceted profile of the career achievements of Sophie Davis alumni and their contributions to the physician workforce in New York State. Data sources include the AMA physician Masterfile (N=1,491), student academic records (N=1,524), and survey information (N=425).Results/Lessons learned: Results show that our graduates, many of whom are females (48%), underrepresented minorities (23%) or first-generation Americans (57%), have worked in health profession shortage areas (24%), providing primary care (46%) and other specialty services (54%). Within these sectors, nearly half of our graduates' patient population is comprised of African-Americans or Latinos (41%), many of whom are Medicaid recipients (22%), managed care/health maintenance organization users (17.5%), and/or charity service beneficiaries (2%).Discussions and conclusions/Significance: Our approach to strengthening the nation's health by improving the diversity of the healthcare workforce includes: a) a holistic method to recruiting graduates from area high-schools in underrepresented minority communities (MCATs are not required), b) integrating community-level engagement and the placement of students in community health centers as part of the curriculum, and c) creating a learning environment that promotes cultural diversity and competence in healthcare. At Sophie Davis, diversity is a core value which embodies inclusiveness and mutual respect for different perspectives, serving as a catalyst for health equity. We strive for diversity so that our students will learn to best serve those patients and communities most in need of care.Reflection: This study is not, however, a comprehensive assessment of diversity initiatives, or even of the types of initiatives available. Rather, it is a description of a replicable program model that the researchers hope may be useful to our colleagues in medical education, encourage development of new diversity initiatives, and help to build support for diversity in the medical profession.References: Girotti J, Soo Park Y, Tekian A. Ensuring a fair and equitable selection of students to serve society's health care needs. Med Educ 2015;49:84–92. Southgate E, Kelly BJ, Symonds IM. Disadvantage and the 'capacity to aspire' to medical school. Med Educ 2015;49:73–83. Med Educ 2015;49:73–83. Thomson WA, Denk JP. Promoting diversity in the medical school pipeline: a national overview. Acad Med 1999 Apr;74(4):312-4.

Poster F-23: Implementing Longitudinal Primary Care Clerkships to Optimize MD/PhD Clinical Education

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Purpose/Problem Statement: While several schools have begun instituting longitudinal clinical experiences (LCE's) as part of their curricula1, 2, there is still considerable variability in students' exposure to long-term outpatient care. Preparation of MD/PhD students has been additionally complicated by possible deterioration of existing clinical skills during pre- and post-clerkship years when these students conduct laboratory research. Our goal is to characterize the features of longitudinal primary care education sites that best promote maintenance and expansion of dual degree students' clinical skills during research years. Findings may also be extended to inform creation of LCE's within traditional MD curricula, reflecting the growing acknowledgment in medical education of the need for instruction of students in the nuances of outpatient care.Methods/Approach: Our institution's MD/PhD program currently allows trainees to attend clinic half a day per week while conducting PhD research at a number of different adult and pediatric primary care centers. Several years after program commencement, we are now using interviews with participating students to learn how experiences: (1) strengthened students' clinical knowledge and skills; (2) informed patient interaction style; (3) provided interprofessional education on roles in the health care team; and (4) reinforced scientific research. Interviews have been one-on-one organized around a series of scripted questions. The Grounded Theory3

approach will continue to be used to analyze narrative data.Results/Lessons learned: At present, we have completed all planned interviews and are in the process of final data analysis. Preliminarily, students show a general trend toward appreciating the increased opportunities for autonomy presented by longitudinal clerkships, as well as the potential for evolving feedback from preceptors with whom students are better able to build a relationship. The primary strength of our study is expected to be the wealth of data generated by our open-ended approach, which should allow us to identify a wide variety of themes and actionable critiques.Discussions and conclusions/Significance: Reflecting a growing acknowledgment of the importance of primary care and outpatient clinical training in medical education, we believe our study has the potential to significantly enhance instruction of dual degree candidates. Though multiple studies have examined the potential of longitudinal clinical experiences, to date no studies have been published directly examining their potential unique role in physician scientist training. With over 5,000 MD/PhD students enrolled nationally in the US in 2015, including students in 43 designated Medical Scientist Training Programs receiving direct federal funding, this group represents a broad subset of medical trainees and institutions who stand to benefit from curricula optimized to take advantage of their unique situations.Reflection: The wealth of data generated by study may also prove a limitaiton. Highly divergent responses on certain topics highlight the need for future studies to better targeted incompletely elucidated topics. Future studies may expand data collection to traditional medical students participating in longitudinal experiences, as well as students working in fields beyond primary care.References: 1. Walters L, Greenhill J, Richards J, et al. Outcomes of longitudinal integrated clinical placements for students, clinicians and society. Med Educ. 2012;46: 1028-1041. 2. Teherani A, Irby DM, Loeser H. Outcomes of different clerkship models: longitudinal integrated, hybrid, and block. Acad Med. 2013;88: 35-43. 3. Charmaz K. Grounded theory: Objectivist and constructivist methods. 2nd ed. Thousand Oaks, CA: Sage, 2000.

Poster F-24: Using Entrustable Professional Activities to Assess Medical Students in a Longitudinal Integrated Clerkship

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Purpose/Problem Statement: 1. Describe the use of the Entrustable Professional Activities (EPAs) in a Longitudinal Integrated Clerkship (LIC) 2. Apply EPAs in the evaluation of students in an LIC 3. Compare and contrast the use of EPAs in an LIC to a traditional block clerkship modelMethods/Approach: The Warren Alpert Medical School of Brown University (AMS) began a Longitudinal Integrated Clerkship (LIC) for the 2015-2016 academic year. To our knowledge, evaluating students in an LIC with Entrustable Professional Activities has not yet been done.Results/Lessons learned: To assess students' progress through this new 8-month clerkship, we developed two related tools based on the Entrustable Professional Activities (EPAs). The first tool, "Stages of Progress in the LIC", maps out four levels of EPA achievement, taking learners from novice to proficient in the aforementioned EPAs. The second tool is a set of four evaluation forms corresponding to each "Stage" of LIC progress and EPA attainment. We surveyed AMS clerkship directors for feedback on both tools, which led to focusing on those EPAs deemed attainable at the entrustable level by the end of core clinical clerkships (see EPAs listed above). We are currently training both the LIC faculty and LIC students to use these EPA based documents to propel learning and inform evaluation throughout our LIC. We ultimately plan to assess the validity of these instruments in LIC settings.Discussions and conclusions/Significance: n/aReflection: We have learned that not all EPAs can easily be assessed in the 3rd year. Furthermore, in an LIC structure, some EPAs (such as EPAs 1 and 7) can be assessed very early for most learners while others (such as

EPAs 2 and 3) may take the duration of the LIC to assess. Many EPAs necessary for success in residency may be attained in a LIC model. However, the rate at which each EPA is attained may differ between the traditional clerkship and the LIC models. Furthermore, other questions remain unanswered including translating the level of entrustment to an actual grade for students in the LIC.References: 1. Hawkins RE, Welcher CM, Holmboe ES, Kirk LM, Norcini JJ, Simons KB, Skochelak SE. Implementation of competency-based medical education: are we addressing the concerns and challenges. Med Educ. 2015; 49: 1086-102. 2. Hauer KE, Boscardin C, Fulton TB, Lucey C, Oza S, Teherani A. Using a curricular vision to define entrustable professional activities for medical student assessment. J Gen Intern Med. 2015; 30: 1344-8. 3. Epstein-Lubow G, Cineas S, Yess J, Anthony D, Fagan M, George P. Development of a longitudinal integrated clerkship at the Warren Alpert Medical School of Brown University. RI Med J. 2015; 98: 27-31.

Poster F-25: The Educational Handoff: Blending Digital Learning and Standardized Patient-Based Assessment to Measure and Enhance Core Entrustable Professional Activities for Entering Residency (CEPAER)

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Purpose/Problem Statement: Medical educators are being challenge to ensure that new residents demonstrate competence in 13 core Entrustable Professional Activities to Enter Residency (CEPAERs) recently defined by the AAMC. However, there is no consensus on how this should be addressed, assessed, and documented nor is there good baseline data on our graduates, many of whom are many months from their last clinical rotation.Methods/Approach: We sought to both develop and benchmark clinically meaningful, instructionally responsive measures and methods to assess most of the CEPARs and pilot an efficient and scalable blended digital learning and performance based assessment strategy to address gaps in readiness for internship. With IRB approval, in the 3 weeks prior to graduation we recruited 108 (66 MS4& 42 MS3s) students to participate in a 3-hour “readiness for internship” event. Readiness to address new onset oliguria and headache in the acute care setting was assessed in four complex Standardized Patient (SP)/Standardized Nurse (SN) simulation cases (CEPAERs 1-5,9-12). SPs and SNs underwent extensive case portrayal and rater standardization training. Students participated in one case before and two after viewing a module (OLIGURIA) - one of a series of WISE-OnCall interactive case-based multimedia digital modules designed to prepare interns for diagnosing and managing common clinical coverage problems (http://wmddvl.s3-website-us-east-1.amazonaws.com/Oliguria/v5_0_1/index.htmlMDOC). In each case the student, playing the covering intern was asked to return a page to the SN, evaluate the SP, collaborate with the SN & then write a “coverage note”(total 30 min). Students could request lab values, ECGs and imaging results and simple bedside procedures (Foley catheter placement, IV fluids) from the SN in the room. We designed pilot activities to assess CEPAERs 6-8,13 using validated measures when available (Asemota, et.al. 2013; Farnan et. al., 2010; Gillespie, et. al. 2015). We analyzed the data overall and by 3rd vs. 4th year students and presented it to educational leadership using a variety of visualizations for comment and feedback.Results/Lessons learned: Baseline CEPAER performance of these motivated volunteers were highly variable with 3rd year performance higher than 4th on all measures except declarative knowledge and clinical reasoning where 4th year were superior. This may represent expertise reversal and or volunteer bias. There were moderate to large gains in EPAs 1-5,9-12 domains with a narrowing of variance, measured pre/post Wise-OnCall among all students but much more pronounced

among 4th year students (“boosting”) so that in the end both groups were equivalent in all measures except clinical reasoning. Although refinement is needed, our assessments of all core EPAs were feasible, authentic, synthetic and reasonably reliable measures. Blended use of WISE-OnCall and simulation identified and addressed significant “readiness for internship” gaps. Students appreciated the “booster” and reported that this 3-hour event was highly educational, challenging but enjoyable. Presentation of this individual complex, multidimensional data is best done using radar graphs.Discussions and conclusions/Significance: This work adds to the burgeoning literature on educational handoffs, use of web-based instructional materials to facilitate transition to internship, strategies to best to visualize/report this data to maximize the educational benefit to transitioning students and actionable information to residency program directors and provides current baseline data on the performance of near interns compared with that of students one year from graduation.Reflection: Current Questions— How best to visualize/report this data to maximize 1) the educational benefit to transitioning students? and 2) actionable information to residency program directors?References: Asemota, E., Winkel, A., Vieira, D., & Gillespie, C. (2013). A novel means of assessing evidence based medicine skills. Medical education 47.5 (2013): 527-527. Farnan, J., & Paro, J. (2010). Hand-off education and evaluation: piloting the observed simulated hand-off experience (OSHE). Journal of general internal medicine 25.2 (2010): 129-134. Gillespie, C., Adams, J., & Hanley, K. (2015). “We might as well be speaking different languages”: an innovative interprofessional education tool to teach and assess communication skills critical to patient safety. BMJ Simulation and Technology Enhanced Learning (2015): bmjstel-2014.

Poster F-26: Teach a Student To Fish: Evaluating and Developing EPAs in Surgical Clerkship

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Purpose/Problem Statement: Competency based education is quickly becoming an important part of medical education. In previous paradigms, the evolution from medical student to intern has been a “baptism by fire” with a sudden immersion in clinical activities and new responsibilities. Boot camps and intern training sessions were developed to ease this transition. Recognizing the increasing importance in clinical skills, and the Association of American Medical Colleges published the Core Entrustable Professional Acitivites (EPA) to assess medical students on clerkship. [1] On a surgical service, much of the teaching is “on the fly” and can vary as it is both sensitive to opportunity and enthusiasm. Can this established teaching paradigm be integrated to EPAs to ensure the education of competent physicians and equalize the educational experience of medical students on the surgical service during their clerkship?Methods/Approach: This pilot program will take place on general surgery service on a university hospital campus with affiliated medical school and surgical residency program. Chief residents were briefed on EPAs and administered a survey assessing ability to evaluate EPAs with the current teaching model. Areas of deficiency and remedies were discussed. Our current teaching practice will be modified to allow medical students to develop clinical skills outlined by EPAs. The course of the day will remain the same, however the chief residents and students will be asked to monitor their clinical and procedural competencies. Students will be asked during patient presentations to verbalize interpretations of lab tests, orders and prescriptions. Prior to surgery, they will be assessed on essentials of the informed consent. Competencies will be recorded by chief resident for study purposes and will not directly affect grading. The effect of this increased focus on EPAs will be measured via survey which will assess primarily feasibility and benefit. For comparison, we will also administer surveys to medical students on services where the chief residents do not enforce an EPA based curriculum.Results/Lessons learned:

Preliminary results of the chief residents and current medical students identified strengths and deficiencies of the current paradigm. Current strengths are oral presentations and procedures (venipuncture, IV insertion). Deficiencies are in documentation, orders, obtaining consent, and identifying system failures. Limiting factors include hospital regulations that prevent medical students from acting independently. The chief residents also identified procedures that should be expected of graduating medical students in addition to those suggested in the EPA outline. This data was used to design the pilot study. From the pilot program we anticipate that our results will demonstrate the feasibility of this program in development of clinical skills. We expect that not all clinical or procedural competencies may be achieved based on available opportunities, and hope that this will allow us to modify our daily routine to cover all aspects of EPA's.Discussions and conclusions/Significance: The shift toward competency based education is becoming more prevalent in both the medical school and residency environments. Although evaluation of trainees via EPAs and its partner, the ACGME milestones, have been well established, the development of these skills warrants attention.Reflection: In the setting of a demanding clinical service such as surgery, we hope that this will demonstrate that the EPAs are not additive work, but rather an already existing teaching tool that merely requires recognition. We hope that this will create an environment of uniform enriched teaching on surgical services.References: 1. Core Entrustable Professional Activities for Entering Residency." Core Entrustable Professional Activities for Entering Residency Curriculum Developers' Guide. Association of American Medical Colleges, 2014. Web. 10 Nov. 2015.

Poster F-27: Assessing Senior Medical Student Proficiency in Entrustable Professional Activities (EPAs) Using a Flipped, Blended Learning Residency Preparation Course

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Purpose/Problem Statement: The AAMC recently published thirteen "Core Entrustable Professional Activities (Core EPAs) for Entering Residency" to identify the activities that medical school graduates should be entrusted to perform without direct supervision1-3. This movement towards a competency-based medical education (CBME) aims to improve both learning and clinical outcomes by delineating the knowledge, skills, and attitudes that residency directors should come to expect of all incoming interns1,2. As medical schools implement the Core EPAs, meaningful and practical assessments will likely be needed to inform decisions about entrustment.Methods/Approach: We discovered that a residency transition course using blended learning, flipped classroom methods piloted at our institution, "Ready for Residency (R4R)," can be used to assess student readiness for entrustment in some EPAs. R4R combines interactive in-class sessions with an online, case-based curriculum that incorporates learning resources, activities, and assignments. As a proof of concept, we reviewed submissions for an assignment from R4R, "completing an order set," to evaluate preparedness for AAMC EPA 4: "enter and discuss orders/prescriptions." During R4R, individual students submitted admission order sets for the virtual, online "patient of the week" (POTW). Later in the course, teams of students submitted collective admission order sets for a different POTW. To evaluate the submissions, we devised and used a rubric guided by the AAMC's description of the key functions required for EPA 43. The rubric included criteria reflecting orders entered consistent with an entrustable learner (e.g. appropriate medicine reconciliation, correct documentation of allergies, and avoidance of medications with clear contraindications). Submissions were graded as "pre-entrustable" or "consistent with entrustable."Results/Lessons learned: A flipped, blended learning capstone course like R4R can be a valuable tool for evaluating student proficiency in curricular outcomes and competencies such as the EPAs. Such courses are uniquely suited for this role given their placement at the end of medical school and seamless integration into the

curriculum. The flipped format and convenient online submission and evaluation process provide flexibility for both learners and educators, allowing each to progress at their own pace. Our data revealed several opportunities for improvement, including performing medicine reconciliation, determining drug dosing, and requesting appropriate isolation precautions. Two of six teams prescribed drugs that directly conflicted with the allergies of the POTW. Our results demonstrate the ability to evaluate readiness for entrustability in EPA 4 and highlight the need for targeted assessment and remediation in the interest of patient safety just prior to graduation from medical school.Discussions and conclusions/Significance: n/aReflection: We describe a practical and innovative approach to implementing an EPA-based assessment shortly before graduation from medical school. Other EPAs could easily be woven into such courses, allowing educators to assess student proficiency across many domains. In fact, R4R already requires students to “prioritize a differential diagnosis following a clinical encounter” (EPA 2), “recommend and interpret common diagnostic and screening tests” (EPA 3), and “form clinical questions and retrieve evidence to advance patient care” (EPA 7), among others. The flipped, blended learning environment can provide educators with a safe, simulated, and standardized opportunity to assess student proficiency without the inherent variability of the clinical setting. By better understanding student proficiency, educators can be better informed of existing curricular gaps, thus facilitating curricular design to benefit learning and patient safety. Future directions include summative evaluations of other EPAs and implementing similar assessments earlier in the curriculum as “checkpoints” to monitor student progress.References: 1. Chen HC, van den Broek WE, ten Cate O. The case for use of entrustable professional activities in undergraduate medical education. Acad Med 2015;90:431-6. 2. El-Haddad C, Damodaran A, McNeil HP, Hu W. The ABCs of EPAs - an overview of 'Entrustable Professional Activities' in medical education. Intern Med J 2015. 3. Association of American Medical Colleges. Core Entrustable Professional Activities for Entering Residency: Curriculum Developers Guide. 2014 Washington, DC Association of American Medical Colleges

Poster F-28: Mapping the Key Functions of EPAs 1, 5, 6 and 12 to the Core Clerkships

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Purpose/Problem Statement: Medical educators across the country are trying to implement the framework of the AAMC’s Core Entrustable Professional Activities for Entering Residency (Core EPAs). However, there are not yet best practices for mapping out each of the Core EPAs’ Key Functions – those elements that the learner needs to demonstrate to be entrusted – across the core clinical clerkships. In this project, we propose a framework for student assessment and feedback on EPAs 1, 5, 6 and 12 within the major clinical year clerkships.Methods/Approach: The Columbia University College of Physicians and Surgeons (P&S) is one of ten pilot institutions testing the implementation of Core EPAs. P&S is focusing on EPAs 1 (gather a history and perform a physical examination), 5 (document a clinical encounter in the patient record), 6 (provide an oral presentation of a clinical encounter) and 12 (perform general procedures of a physician). The Core EPA Pilot Group at P&S is in the planning phase of developing the framework for implementing these EPAs into the clinical clerkships. So far, we have mapped the Key Functions for each EPA to the core clerkships (medicine, surgery, obstetrics and gynecology, pediatrics, primary care, psychiatry, neurology) and subspecialty clerkships (anesthesia, neurosurgery, ophthalmology, orthopedics, otolaryngology) in which they may best be observed and assessed. (See Attachment) We are working on integrating the Key Functions into the clerkships’ traditional assessment tools, including the observed history and physical, the mid-clerkship feedback, the objective structured clinical exam, and the end-of-

clerkship clinical assessment. We are in the midst of planning Core EPA-based faculty development materials for clinical supervisors and orientation materials for students. We are also developing methods for longitudinal feedback about students' progress toward entrustment that may be used by faculty coaches working with students.Results/Lessons learned: While practically many of the Key Functions comprising each core EPA can be assessed across most clinical clerkships, some clerkships may offer clinical environments and close supervision that are more likely to generate meaningful and specific feedback. Though some of these distinctions will be specific to the institution, we anticipate there are enough commonalities across core clerkships to allow elements of this framework to be generalizable to other medical schools exploring the implementation of the Core EPAs. As we move forward in this process, we expect to gather crucial information to help answer many unanswered questions including: 1. What is the best time during the clinical clerkships to assess students in the Key Functions? 2. How do we help students shore up their abilities as assessments identify focal weaknesses? 3. What number of observations in each Key Function is necessary to support an entrustment decision? 4. What level of case complexity, diversity in assessment types (narrative comments, direct observation, etc.) and settings (inpatient, outpatient, ER, simulation) will be necessary to support entrustment?Discussions and conclusions/Significance: n/aReflection: We hope our pilot clinical year EPA-based assessment and feedback curriculum will help other institutions implementing the Core EPAs. Much will be learned through the successes achieved and the challenges faced in designing and implementing this new exciting curriculum.References: Association of American Medical Colleges (AAMC). Core Entrustable Professional Activities for Entering Residency. 2013. https://www.mededportal.org/icollaborative/resource/887. Accessed November 30, 2015.

Poster F-29: House Librarians as Instructors in a Self-Directed, Capstone-Related 3rd year Flexible Clinical Experience program

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Purpose/Problem Statement: In academic year 2010/2011, the University of Massachusetts Medical School introduced a new, longitudinal, integrative curriculum (LiNC). One component of this new curriculum was the introduction of Learning Communities or Houses.". Five Houses were formed to allow inter-class interaction, each that would serve as the medical student's academic and social home. A librarian from the Lamar Soutter Library was attached to each House. Two new components of the LiNC curriculum were a) a longitudinal, cumulative capstone project and b) a 3rd year Flexible Clinical Experience (FCE) program. The first was a natural fit for the House Librarians to interact with students as they conducted foundational research for their Capstone. The second was developed to allow students in their 3rd year an opportunity to choose a pre-designed elective or design their own clinical experience. One type of self-designed FCE is based in the library where students can spend one week conducting research towards their capstone project.Methods/Approach: Beginning in academic year 2015/2016, students choosing the library-based FCE are formally required to work with their House Librarian. The librarians now act as the course supervisors. The students share their capstone proposals with their House Librarian and the librarians, in turn, provide comprehensive, library-based research experience, guide students to relevant resources, teach search techniques, and serve as library support for any library or research needs. Following each FCE, the students submit course evaluations. By the spring of 2016, there will be a significant number of evaluations from students that have completed the self-directed FCE with librarian supervision. The authors plan to review the FCE library-based course evaluations for

the current year against those from when the House Librarians were not directly involved.Results/Lessons learned: The capstone project can take many different forms, from a traditional research paper to a community outreach project to an artistic expression of medical education. But regardless of format, the capstone must consist of a scientific foundation, guided by evidence and grounded in a fundamental understanding of the literature. By comparing student evaluations responses from before and after formal librarian involvement, we hope to understand the impact librarians have had on capstone preparation, further adapt our methods to improve library integration into this component of the curriculum and explore ways to encourage more students to select the library-based FCE.Discussions and conclusions/Significance: -Reflection: Because the library-based FCE now requires students to have direct supervision by their House Librarians, our goal is to use information gleaned from the student evaluations to learn how librarian immersion in this component of the curriculum can contribute to the success of both the self-designed FCE and capstone projects.

Poster F-30: Developing an Integrated Clinical Neurosciences Clerkship for Third-Year Medical Students

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Purpose/Problem Statement: The World Health Organization predicts that neurologic disorders will account for 7% of all disease and 12% of all deaths worldwide by 2030. However, neurology is not a required part of the medical curriculum in almost half of medical schools, contributing to “neurophobia.”1 Introducing neurology in an integrated fashion allows students to gain a big picture view of clinical neuroscience and has been advocated in medical education.2 At The Warren Alpert Medical School at Brown University, neurology became a required core clerkship for all third year medical students in May, 2014 with a pre-existing psychiatry clerkship. Our goal was to successfully developed an integrated clinical neuroscience clerkship and highlight the strengths and weaknesses in developing this innovative clerkship.Methods/Approach: In the initial year of the integrated clerkship, students spent two weeks of their six-week clerkship on neurology. The neurology shelf exam was not required. Students completed an objective structured clinical examination (OSCE) in which one of the five cases was an integrated case. Didactics were integrated temporally but not in content. The following year, the clerkship was expanded to eight weeks. Four weeks were spent rotating on neurology. Four of the didactics were integrated and co-taught by a neurologist and psychiatrist. A longitudinal component of one half-day over the eight weeks in either neurology or psychiatry was added. Three of the five OSCE cases were integrated, and the neurology shelf exam became required.Results/Lessons learned: Students in the initial year felt that the clerkship taught both neurology and psychiatry simultaneously but not in an integrated fashion. The neurology experience was at times viewed as an interruption to the psychiatry clerkship. With the increased exposure to neurology, students felt that they understood the objectives of the clerkship more clearly (54% vs. 29%). They also felt that the evaluation criteria were more clear and fair (52% vs. 21% and 47% vs. 26%, respectively). Students reported an improved learning experience on neurology with increased exposure (41% reporting excellent teaching on rounds vs. 26% in the pilot year). The overall evaluation of the clerkship as a learning experience increased from 10% to 21% reporting an excellent experience and 43% vs. 50% reporting a very good experience. Students felt that the exposure to neurology included the major neurological diseases and allowed them to understand the wide breadth of the specialty. There was improved direct contact with patient care, and students felt that they were valued in patient care and played an important role on the clinical team. Timing of the two shelf exams remains a struggle in integrating the clerkship.Discussions and conclusions/Significance: Medical education is moving towards

innovative restructuring and integrated learning experiences.3 As the clinical neurosciences clerkship evolves, there will be more opportunity for integration with didactics and educational experiences, allowing students to appreciate the breadth of neurosciences in all specialties, and the overlap in psychiatry and neurology. A combined shelf exam may be a part of future clerkships.Reflection: N/AReferences: 1. Albert DV, Yin H, Amidei C, Dixit KS, Brorson JR, Lukas RV. Structure of neuroscience clerkships in medical schools and matching in neuromedicine. Neurology 2015;85(2):172–6. 2. Malik AS, Malik RH. Twelve tips for developing an integrated curriculum. Med Teach 2011;33(2):99–104. 3. Gaufberg E, Hirsh D, Krupat E, Ogur B, Pelletier S, Reiff D, Bor D. Into the future: patient–centeredness endures in longitudinal integrated clerkship graduates.

Poster F-31: Development of an Advanced Clinically Integrated Neuroanatomy Elective for 4th Year Medical Students

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Purpose/Problem Statement: A need was identified at our medical school for additional educational opportunities for 4th-year medical students in clinically-related neuroanatomy. Such opportunities were viewed to be particularly advantageous for those students applying for residency positions in fields requiring more advanced neuroanatomical knowledge, such as neurology, neurosurgery, neuroradiology and psychiatry. To address this need, a 4-week elective course was developed for the 4th-year medical curriculum to focus on brain structure-function relationships and on the correlation of neuroanatomy with clinical observations.Methods/Approach: An advanced neuroanatomy elective was designed to use a combination of laboratory, lecture, journal club and case-study formats to examine neuroanatomy from a contemporary perspective. The elective includes an extensive laboratory component that reviews brain structure, function, pathology and blood supply using whole brains, brain sections, stained sections and various imaging modalities. The students spend time during each week of the elective in clinical departments, under the supervision of attending physicians, observing patients with neurological complaints, reviewing brain images of current patients and applying neuroanatomy to clinical cases. Many of the didactic and clinical experiences focus on neurodegenerative diseases and stroke. In addition, students visit a local rehabilitation hospital where they observe the longer-term consequences and management of brain damage resulting from trauma or disease. The materials and resources needed for this elective are as follows: 1) Preserved whole brain specimens for observation, sectioning and dissection; 2) Laboratory session study guides, in the form of PowerPoint presentations compiled from photographs of gross brains, brain sections, angiograms etc., which are then annotated to direct each learning exercise; 3) Basic science and clinical faculty with the expertise to present lectures and case-study sessions; 4) Clinical faculty to supervise the students during patient encounters and in neuroradiology.Results/Lessons learned: The elective has been offered for three consecutive years (2013-2015), with an enrollment ranging from 6 – 10 students. The feedback from those students has been largely very positive, and the constructive critiques received have been used to refine the design of the elective over time. The principal lessons learned have been that the students are: 1) most enthusiastic about the neuroanatomy laboratory sessions and the opportunity to learn from the observation and dissection of real brain specimens; 2) least enthusiastic about some of the shadowing-type clinical experiences that were scheduled in the 2013 iteration of the elective, such as in the emergency and neurology departments; 3) appreciative of the lecture and case-study sessions, but less appreciative of the journal clubs, which they viewed as too heavily focused on the basic sciences; 4) at a point in their medical education where they can work in a highly productive,

independent and active learning environment; 5) at a point in their medical education where they are anxious to be involved in patient care, rather than just observing the patients being treated by the attending physicians and residents.Discussions and conclusions/Significance: There is substantial evidence that medical students show better retention of basic science information when that information is presented in a case-based curriculum (Malau-Aduli et al, 2013). There is also evidence in the literature for development of elective courses for 3rd or 4th year students that incorporate basic science and clinical elements for subject areas other than neuroanatomy (Spencer et al, 2008; Lazarus et al, 2014). We conclude that our development of a clinical neuroanatomy elective for 4th year medical students is novel, as well as highly beneficial to the students, and could be duplicated at other medical schools or adapted to other subject areas.Reflection: n/aReferences: Malau-Aduli BS, Lee AY, Cooling N, Catchpole M, Jose M, Turner R. Retention of knowledge and perceived relevance of basic sciences in an integrated case-based learning (CBL) curriculum. BMC Med Educ. 13:139, 2013. Spencer AL, Brosenitsch T, Levine AS, Kanter SL. Back to the basic sciences: an innovative approach to teaching senior medical students how best to integrate basic science and clinical medicine. Acad Med. 83(7):662-9, 2008. Lazarus MD, Kauffman GL Jr, Kothari MJ, Mosher TJ, Silvis ML, Wawrzyniak JR, Anderson DT, Black KP. Anatomy integration blueprint: A fourth-year musculoskeletal anatomy elective model. Anat Sci Edu. 7(5):379-88, 2014.

Poster F-32: Communication skills of first year medical students wane with the use of sonography

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Purpose/Problem Statement: Significant curricular emphasis on rapport building skills from the first year of medical school has resulted in increased empathic conversation, effective non-verbal skills and early recognition of opportunities for partnership with patients in a clinical skills lab. However, the transfer of these skills into other settings, simulated or real, is unknown. Furthermore the retention of these skills with the simultaneous use of ultrasound is also unknown, but a potential distractor. We compared communication skills across multiple simulated settings and in conjunction with ultrasound performance.Methods/Approach: 97 students participated in a clinical skills assessment at the end of the first year of training utilizing standardized patients (SP). Assessment focused on building rapport through measurable and observable skills such as empathic conversation, non-verbal behaviors, introduction, partnership statements and judgmental behaviors. Students went through seven stations in total. One station required an ultrasound to be performed. Each SP completed the same core communication checklist items which were compared using a t-test. The correlation between student performances on ultrasound with communication skills was ascertained.Results/Lessons learned: Empathy and statements of partnership were significantly lower in the station involving ultrasound performance ($p<0.001$). There was little correlation between student's ultrasound images and their communication skills (0.28). Non-verbal and judgmental behaviors were not significantly different between the stations with and without ultrasound.Discussions and conclusions/Significance: Core communication skills that occurred in an outpatient setting waned when students were also asked to perform an ultrasound. This effect does not seem to correlate with comfort level of using ultrasound. A limitation to the study was that the ultrasound station wasn't performed in the clinical skills center with the other 6 stations but at the Clinical Skills rooms at the School of Medicine. Students may not have been able to easily engage in this different environment.Reflection: Curriculum in communication skills during procedures such as ultrasound, or using an electronic medical record, should be

developed to help students transfer essential skills.References: Cole, S. A., & Bird, J. (2014). The Medical Interview. Philadelphia: Elsevier Saunders.

Poster F-33: Medical Students' Perceptions of Self-Care Activities

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Purpose/Problem Statement: In the process of creating and validating a self-care inventory (SCI) in a medical student population, a clear relationship between students' self-rating of their own self-care and their assessment of individual self-care activities was observed. This research focuses on these perceptions.Methods/Approach: The prevalence of burnout in medical students is estimated to be around 56%.1 Students may be able to combat burnout by performing self-care activities and improving their wellness.2Results/Lessons learned: A sample of 185 SCIs completed by four class years of University of Vermont College of Medicine (UVM COM) medical students were analyzed. 136 SCIs were from the baseline assessment, and 49 were from a follow-up assessment one year later. A correlation matrix and multiple linear regression analysis were performed to understand the relationship between medical students' perceptions of their overall self-care, what activities might be related in forming that perception, and what items were predictive of students' overall self-care ratings.Discussions and conclusions/Significance: The mean self-care rating (out of a maximum of 6) was 4.43 (.845 SD): 4.43 (.857 SD) at baseline and 4.45 (.818 SD) at follow up. Students' self-care rating was positively correlated with: frequency of exercise (0.283), spending time outdoors (.248), sleeping (.374), eating/cooking (.255), spending time with family & friends (.232), taking breaks (.220) and talking to spouse/partner/family (.181). These correlations were statistically significant ($p<.05$) using Pearson Correlation. Multiple linear regression produced using backward stepwise elimination (entry .05, removal .10) produced a model that accounts for 27% ($r2=.267$) of the variance in self-report SCI value. Items that remained significant predictors within the model were exercise ($\beta=.183$, $p=.000$), formal counseling ($\beta=-.099$, $p=.040$), sleeping ($\beta=.297$, $p=.000$), time with family/friends ($\beta=.096$, $p=.063$), taking breaks ($\beta=.133$, $p=.020$), and talking to spouse/partner/family ($\beta=.098$, $p=.033$).Reflection: Based on positive correlations with an overall self-rating variable, UVM COM medical students perceive good self-care to be associated with more time spent exercising, spending time outdoors, sleeping well, taking time for healthy eating and cooking, spending time with family & friends, taking breaks, and talking to spouse/partner/family. The predictive model that is designed to assess what SCI items holistically factor into students' perception of their own level of self-care eliminated spending time outdoors and healthy eating/cooking as predictors of students' perceptions of self-care. Exercise, sleeping, spending time with family and friends, taking breaks and talking with spouse/partner/family were all positively predictive of students' self-care self-rating, while formal counseling seems to detract from the student's perception of their self-care activities contributing to their wellness. This suggests that attending counseling may be associated more with psychological distress than a proactive self-care activity. This research was limited by the fact that that it was connected to the process of validating the SCI survey instrument, which for efficiency's sake contains an abbreviated list of self-care activities. Further study should examine a more comprehensive list of self-care activities. Furthermore, SCI responses should also be related to other outcomes, such as professional burnout or depressive symptoms. Nevertheless, the present study demonstrates that that the SCI shows promise as a measure of self-care, and that we may begin to differentiate particular self-care activities and assess their impact on medical student well-being.References: 1. Dyrbye LN, West CP, Satele D, Boone S, Tan L, Sloan J, Shanafelt TD: Burnout Among U.S. Medical Students, Residents, and Early

Career Physicians Relative to the General U.S. Population. Acad Med. Mar 2014;89(3):443-451. 2. Ball S, Bax A. Self-care in medical education: effectiveness of health-habits interventions for first-year medical students. Acad Med. Sep 2002;77(9):911-917.

Poster F-34: Implementing Electronic Medical Record (EMR) Training into a Preclinical Medical School Curriculum

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Purpose/Problem Statement: To compare two methods of EMR training in consecutive medical school classes in the pre-clinical phase. To compare educational outcomes of the two methods using a survey and a validated quiz.Methods/Approach: EMR is an important and growing tool. Several authors have conjectured that introducing EMR training in the preclinical phase of medical school may be useful. However, research on the topic is limited.Results/Lessons learned: We are conducting this study to compare two methods of EMR training in consecutive medical school classes in the pre-clinical phase. The class of 2018 will receive a 2-hour seminar shortly before their clerkships aimed at teaching technical skills of navigating EMR. The class of 2019 will receive this seminar, and in addition, will be assigned to follow a virtual patient with cystic fibrosis, with multiple opportunities during their pre-clinical years to interact with her EMR, as her illness evolves. This project is aimed at teaching students the advantages, pitfalls, and technical skill of EMR. The two classes will be assessed with a survey and a validated quiz on EMR. We will use independent t-tests to compare numerical scores between the two classes and multivariate analysis to adjust for confounding variables such as prior EMR experience.Discussions and conclusions/Significance: n/aReflection: This is an exploratory trial of a new educational intervention that has not undergone pilot-testing. We designed the student encounters with this virtual patient to illustrate key aspects of an EMR. Understanding of these aspects will then be tested by our quiz. It will therefore not be surprising if the quiz results are higher in the intervention group. We do however expect this study to generate further hypotheses to be tested, in particular: (a) which aspects of EMR are most amenable to learning via a virtual patient chart and (b) can such an educational intervention, imbedded in the pre-clinical years, result in a durable change in EMR behavior among clerkship students. Outcomes of this further study may shed light on how best to prepare students for their clinical use of EMR.References: Mintz M, Navarte HJ, O'Brien KE, Klara K, Thomas M, Durning SJ. Use of Electronic Medical Records by Physicians and Students in Academic Internal Medicine Settings. Journal of the Association of American Medical Colleges. 2009;84:1698-1704. Tierney MJ, Pageler NM, Kahana M, Pantaleoni JL, Longhurst CA. Medical Education in the Electronic Medical Record (EMR) Era: Benefits, Challenges, and Future Directions. Journal of the Association of American Medical Colleges. 2013;88:748-752. Wald HS, George P, Reis SP, Taylor JS. Electronic Health Record Training in Undergraduate Medical Education: Bridging Theory to Practice With Curricula for Empowering Patient- and Relationship-Centered Care in the Computerized Setting. Journal of the Association of American Medical Colleges 2014;89:380-386.

Poster F-35: Who are We?: An Introduction to the Healthcare Team: Dean's Afternoon

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Purpose/Problem Statement: Interprofessional education (IPE) has been identified as a priority for delivery of safe, effective, efficient, patient centered care. The Institute of Medicine noted in

2001 that “equipping a workforce with new skills and ‘new ways of relating to patients and each other’ demands both retraining of the current health professions workforce and interprofessional learning approaches for preparing future health care practitioners.” In that same year the LCME added a new recommendation (7.9) which states that “…the core curriculum of the medical education program prepares medical students to function collaboratively on health care teams that include health professionals from other disciplines as they provide coordinated services to patients” (LCME 2014). An understanding of professional roles and expertise of team members is critical and should start early in student's professional development.Methods/Approach: The leadership at the University of Connecticut appreciated the need for an increase in IPE and the Interprofessional (IP) Task Force evolved which consists of members of the schools of nursing, medicine, dentistry, pharmacy, dietetics, social work, physical therapy and allied health/lab sciences. The group was established in 2013 and later converted into a standing university committee, called the Committee on Interprofessional Excellence in Healthcare (CIPEH). Subcommittees were developed that expanded to include both CIPEH member and non-member faculty and include committees for: Dean’s Afternoon, Faculty Development, Student Advisory, IPE curriculum and a web site. Deans committed to cancelling classes for one half-day each semester to provide an IPE specific activity. The inaugural event occurred on October 30, 2015 and is the topic of this abstract. A total of five hundred students participated; each of the aforementioned schools was represented. Both our Storrs, CT and Farmington, CT campuses were utilized with students in eachof 6 auditoria. Lunch was provided for students at their respective campuses and half of each class was bused to the opposite location. The program was slated for 3 hours beginning with taped introductions from the Provost and CIPEH committee chair, followed by a mythbuster activity which was completed in like-discipline groups and then debriefed. Groups brainstormed about the myths surrounding their respective professions and were asked to think about: “What my mom thinks I do”, “What society thinks I do”, “What other health professionals think I do” and “What I think I do” using memes for prompts. (Attached: Mythbusters Meme example). Each group shared 2 myths using a written or sketched response. Next, the groups moved into their presorted IP teams and an ice breaker exercise was done utilizing paper chain creation for a teamwork exercise with a focus on effective communication. Finally, the IP groups discussed a patient case which was provided for their review in advance. Timing was precise and carefully considered. The learning objectives for the patient case exercise included: -Apply the principles and 4 core competencies of Interprofessional Education (IPE) and Interprofessional Collaborative Practice (ICP) -Identify IP team members, their roles, and their scope of practice -Explore how the health care team communicates and coordinates care -Articulate the role of the patient in deciding what plan of care is taken The patient in the case had multiple medical, dental, social and physical issues; discussion points were provided. Each team was asked to reflect on values/ethics, roles and responsibilities, communication and teams and teamwork (IPEC's 4 competency domains). Time was allocated for each team to debrief with the larger group about one aspect. Students were surveyed before and after the event and results will be analyzed.Results/Lessons learned: An event of this magnitude requires much planning and coordination. Detailed plans and timing might be thwarted by a late bus or other uncontrollable factor. Faculty development was minimal and future improvement is necessary and a key to success. Matching of students based on clinical experience is paramount and requires thoughtful consideration.Discussions and conclusions/Significance: n/aReflection: Overall this first Dean's afternoon was deemed a success as a first step in introducing students to other health professions. Preliminary review of survey results reveals that 85.4% of participants and 84.0% of the medical student subgroup felt that shared learning with other health professions students will increase their ability to understand clinical problems. Additional analysis of survey results will soon be available. Repeated activities will be planned and threaded through the curriculum using clinical intersections with students learning and collaborating together in authentic

environments.References: 1. Interprofessional Education Collaborative Expert Panel. (2011). Core competencies for interprofessional collaborative practice: Report of an expert panel. Washington, D.C.: Interprofessional Education Collaborative. 2. National Academies of Sciences, Engineering, and Medicine. Envisioning the Future of Health Professional Education: Workshop Summary. Washington, DC: The National Academies Press, 2015. doi:10.17226/21796 3. Thistlethwaite J1, Moran M; World Health Organization Study Group on Interprofessional Education and Collaborative Practice. Learning outcomes for interprofessional education (IPE): Literature review and synthesis. J Interprof Care. 2010 Sep;24(5):503-13. doi: 10.3109/13561820.2010.483366

Poster F-36: The Healthcare System as an Early Clinical Home

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Purpose/Problem Statement: The University of Connecticut School of Medicine has embarked on a revolutionary curriculum reform initiative with a core commitment to increase the clinical exposure for early students beyond the half-day per week in our current model. The new curricular element of this project is the development of “Clinical Homes” in Stage 1 with authentic experiences which complement a team-based learning curriculum involving a set of cases based on a family of patients and their diagnoses. The Carnegie Report of 2010 by Cooke and Irby noted “integration” as one of the key themes and recommended that medical educators “connect formal knowledge to clinical experience, including early clinical immersion…, engage learners at all levels with a more comprehensive perspective on patients’ experience of illness and care, provide opportunities for learners to experience the broader professional roles of physicians and to incorporate interprofesssional education and teamwork in the curriculum.” Overarching goals of the new curriculum include individualization of the learning process, integrating formal knowledge with clinical experience, fostering habits of inquiry, life-long learning and innovation and a focus on professional identity formation while nurturing interprofessional team collaboration.Methods/Approach: Our school has been a pioneer in early clinical experience and longitudinal care. Twenty years ago, we instituted a program called the 'Student Continuity Practice', whereby students spend a half day each week in a primary care ambulatory setting for three years providing a longitudinal care experience along with one-on-one mentorship. We plan to continue this ambulatory longitudinal experience and to also provide an analogous healthcare system-based early, longitudinal exposure for an additional half-day each week. The broad goals for this “Clinical Home” experience include early development of the interprofessional team concept, roles and scope of practice across the continuum of care; patient-centered learning with an emphasis on longitudinal care, cultural aspects of care, systems of care and humanistic care; a deep understanding of healthcare systems, healthcare economics, high value care and patient safety and quality; integration and correlation of medical knowledge in the clinical setting; and early professional identity development. Initially we envision students spending time with a variety of providers such as physical therapists, dieticians and administrators to contribute to their broad understanding of the health care system and other professional’s roles. The assignments would be linked, as possible, to the team based learning curriculum. The team based learning pedagogy will be the primary vehicle to facilitate teaching and learning the relevant anatomy, physiology, law and ethics, pharmacology, medical economics etc. as appropriate to the ‘patient’ and augmented with online learning modules and linked to patient-centered clinical activities such as the Clinical Home. When covering a disease in their didactic/team based learning setting (say diabetes), students would attend disease-relevant sessions in the authentic clinical setting – say a diabetes education class (ideally with a patient from their ambulatory longitudinal practice).

Exposure to a range of clinicians, radiologic and other procedures, departments, and activities will broaden students' knowledge of career options and enhance their professional identity development. In addition, while working with discharge planning and/or social work, students would follow a patient to their home with a visiting nurse along with pharmacy and nursing students to assure medication reconciliation and to see the impact of social determinants of health firsthand. Students would be actively contributing to patient care, advocacy, quality and safety. In this model of clinical education students will better integrate and synthesize the topics which are raised in the team based learning curriculum, retain the empathy which they had upon entering school and dive into the intricacies of complex systems. Having a clinical home will allow early students to become an integral part of a health care system in a patient-centric model, while learning about the structure, function and operations of a medical center and the professionals therein—while contributing in a meaningful way and adding value.Results/Lessons learned: As we build this exciting curriculum we have received feedback from our major clinical partners. Our major teaching hospitals provide outstanding experiences for our current clerkship students. The University of Connecticut School of Medicine, along with its academic teaching hospital, is located in Farmington, CT. The three other major hospital systems include two in Hartford and another in New Britain, CT. Our proposal would bring a small group of early students (first and second year) into each of these four major affiliated health care systems and would thus require oversight and administrative coordination. Healthcare systems and their physicians face increasing clinical and regulatory forces; their enthusiasm for additional faculty supervisory roles has been varied. Physician champions and communication about the new learner's goals in each setting, from the top down, will be critical.Discussions and conclusions/Significance: n/aReflection: Integration and coordination between synchronous courses will be crucial, including the team based learning content and the delivery of clinical care course ('doctoring course') such that timing allows students the opportunity to experience what they are learning in an authentic setting as much as possible. In addition, logistics involving multiple healthcare systems and a variety of health professionals appears to be daunting. It will require development of close relationships with upper level administrators, staff coordinators and physician champions for success.References: Dornan T, Littlewood S, Margolis SA, Scherpbier A, Spencer J, Ypinazar V; How can experience in clinical and community settings contribute to early medical education? A BEME systematic review; Medical Teacher 2006; 28:3-18. Grumbach K, Lucey CR, Johnston, SC; Transforming from Centers of Learning to Learning Health Systems – The Challenge for Academic Health Centers. JAMA 2014; 311(11):1109-1110. Irby DM, Cooke M, O'Brien BC. Calls for Reform of Medical Education by the Carnegie Foundation for the Advancement of Teaching: 1910 and 2010. Academic Medicine 2010. 85(2):220-227.

Poster F-37: Cancer Concepts: A Guidebook for the Non-Oncologist: An Update

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Purpose/Problem Statement: Medical students in the United States graduate with an average debt in excess of $150,000.1 They can ill afford the textbooks required, estimated to cost in excess of $5000 over the four year curriculum. While American students need help with the cost of knowledge, students in the emerging world simply need access to current textbooks and

medical literature. Importing books and peer-reviewed journals can be incredibly expensive for a school in this area of the world. A visiting resident from abroad indicated that his school library consists of donated books, usually older editions of standard textbooks. He was extremely grateful to learn that as a resident of a poor country, he could access the New England Journal of Medicine freely online. Computer and internet availability offers potential resolution to these issues of cost and access to current medical information.Methods/Approach: In 2010, the Cancer Concepts Guidebook for the Non-Oncologist was presented at the NEGEA meeting in Hartford, CT. This web-based Guidebook evolved from the handouts created for the first-year students taking the Cancer Concepts course at the University of Massachusetts Medical School, as a textbook at this level was not available. The Guidebook is edited by a multi-disciplinary team of educators to assure that it is appropriate for students of other health sciences. Providing open access to the Cancer Concepts: A Guidebook for the Non-Oncologist offers opportunity to meet the needs of undergraduate and graduate students as well as non-oncologists. This text was designed using digital technologies which provide an interactive learning environment with multi-media richness and low-risk knowledge gap assessments as well as providing author(s)/editor(s) the ability to make rapid revision(s) as science progresses, as course requirements change, or as learners' needs demonstrate.Results/Lessons learned: Within the past year, 1, 717 downloads of the Cancer Concepts Guidebook have been recorded. This presentation highlights implemented need-based updates in the Guidebook to provide a more user-friendly learning experience.Discussions and conclusions/Significance: Professors in higher education in any country can use sections of the Guidebook, revise others and create entirely new sections as their pedagogic or cultural needs dictate. Peer review is an important aspect of this knowledge sharing. With this resource, physicians across the world will have availability to state of the art health care.Reflection: This project is more than a traditional book uploaded onto the internet. The editors hope that this effort will serve as a model for developing a system for the creation and maintenance of online, open access, interactive medical textbooks and eventually science and other textbooks of the future. Funding has been in whole or in part with federal funds from the National Library of Medicine, National Institutes of Health, with the University of Massachusetts, Worcester.References: Youngclaus J, Fresne J, Association of American Medical Colleges. Trends in cost and debt at U.S. medical schools using a new measure of medical school cost of attendance. Analysis in Brief. 2012; 12(2):1-2. Available: https://www.aamc.org/download/296002/data/aibvol12_no2.pdf Accessed 1 December 2015.

Poster F-38: Interprofessional Approach to Nutrition Curriculum: Culinary Medicine at Rutgers Robert Wood Johnson Medical School (RWJMS)

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Purpose/Problem Statement: According to Robert Wood Johnson Foundation, nearly 17% of children and over 30% of adults are obese which increases their risk of obesity related diseases such as heart disease, stroke and diabetes and increases economic burden on healthcare systems1. Team-based care and salutogenesis are essential to address obesity and its related problems2. Interprofessional cooking as part of the nutrition curriculum may help students to integrate nutrition into patient care and improve patient outcomes. Teaching students to cook improves their quality as healthcare providers3. The goals of this project are to assess the

effectiveness of an interprofessional team-based cooking experience for students who incorporate the basics of nutrition and cooking into their practice and to prepare students to comfortably discuss nutrition with their patients.Methods/Approach: Last year, we offered a pilot course in Culinary Medicine, designed by Tulane's Goldring Center for Culinary Medicine (GCCM). We selected 4 of the 8 modules from GCCM. Emails were sent to these students explaining the elective and 16 first year medical students and 8 senior Nutritional Sciences students took the class after a selection process. These 2 group students were divided into 8 working groups such that there were 2 medical students and 1 nutritional sciences student per group. Groups remained constant during the 4 sessions. After IRB approval, students were given 3 Likert-scale surveys covering the administration of the course, working as an interprofessional team, and level of comfort with their own nutritional habits, as well as comfort discussing nutrition with patients. The surveys were before the start and after the completion of the course. Surveys were analyzed using paired t-tests.Results/Lessons learned: The mean scores on Survey 1 showed a significant improvement in the attitude of shared learning and positive impression of other professionals. The mean scores on all questions in Survey 2 increased in a positive direction from the pre-test to post test scores. However, only the questions related to the student eating healthy diet and their ability to educate their patients on healthy food and cooking practices to meet dietary, cultural and financial constraints were statistically significant ($p < 0.05$). As a part of preliminary analysis, we used Wordle to produce word-cloud analyses of the written responses from Survey 3. The results are shown as supplemental data.Discussions and conclusions/Significance: RWJMS has collaborated with the Rutgers Nutritional Sciences Department to form a unique interprofessional educational experience for their students. The preliminary data from the surveys indicate that students benefited from interprofessional training and had a positive attitude towards interprofessional teamwork. Student competency in giving dietary advise, relating to patients in terms of food to make healthier food choices, and talking about the importance of cost, availability, culture, education, location, religion and morality on eating habits were strengthened after taking the course. However, this pilot study had limitations. On the pilot surveys, we did not ask participant gender and field of study. This did not allow us to perform an ANOVA and multiple logistic regressions for variance between sex and study discipline. The surveys in future studies will include information on gender and field of study. An additional limitation of the study was the small n size (n=22). The Rutgers Culinary program is rapidly growing which will strengthen the power of our studies. Currently, we are offering the first module to each first year medical student as part of the Patient-centered medicine course. We are also in the process of expanding our elective course to pharmacy, nursing and physician assistant student.Reflection: In conclusion, our program achieved fostering teamwork. We will follow our students until their graduation to measure long-term effects of interprofessional nutrition education and its influence on nutrition counseling for patients.References: 1. Jeffrey Levi LMS, Jack Rayburn, Alejandra Martín,. The State of Obesity 2014: Better Policies for Healthy America. Washington, DC: Robert Wood Johnson Foundation;September 2015. 2. Kushner RF, Van Horn L, Rock CL, et al. Nutrition education in medical school: a time of opportunity. The American journal of clinical nutrition. May 2014;99(5 Suppl):1167S-1173S. 3. Eisenberg DM, Burgess JD. Nutrition Education in an Era of Global Obesity and Diabetes: Thinking Outside the Box. Academic medicine : Journal of the Association of American Medical Colleges. Mar 17 2015.

Poster F-39: Student Driven Opportunities for Vertical Integration: Maintaining Connection in the Clinical Years at University of Massachusetts Medical School

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Purpose/Problem Statement: During undergraduate medical education, senior students in their third and fourth years often lose engagement with their medical school peers, but remain valuable resources for first and second year students. Historically, at University of Massachusetts Medical School (UMMS), a limited number of senior students would be called upon by faculty to provide advice to pre-clinical students at key transition points. The Learning Communities (LCs) at UMMS sought to improve engagement of a larger, more representative proportion of third and fourth year students as peer-networking resources through specific student-led initiatives. These initiatives were targeted at key transition times for pre-clinical students, but also at relative clinical "down" times when clinical students were already gathered on campus for other activities.Methods/Approach: The student leadership of the UMMS LCs have designed a number of events to draw a large number of clinical students to interact with preclinical students. One such event is the annual "Thanks-Advice-Giving" dinner which invites all students and sits them by their UMMS LC houses, creating structured opportunities to discuss suggested topics or provide general guidance and mentoring. In addition to a free Thanksgiving-style dinner, an incentive for clinical student attendance included back-to-back scheduling with a faculty led residency interview advice session. Other student driven initiatives have crystallized around more specific transition points such as a series of peer to peer advice nights on: planning schedules for fourth year; the third year transition to the wards; the second year transition to working with inpatients; senior student advice on USMLE board preparation; and how to spend the summer between the first and second year. These sessions involve the direct recruitment of senior clinical students by the LCs student leadership, and are organized to take the form of panel or roundtable discussions. These events are separate from but complement faculty designed sessions where clinical students are invited to join formal teaching and instruction sessions.Results/Lessons learned: Student driven initiatives for third and fourth year integration have been highly successful at UMMS. Thanks-Advice-Giving has continued for over 5 years with increasing attendance every year, from all four medical school classes, MD PhD students in their research years, and faculty. Thanks-Advice-Giving has created a number of learning opportunities for the student leaders including the strength of scheduling designed to entice upperclassmen attendance and the importance of event hand-offs from year to year to maintain momentum. Transition point advice nights have been held in individual houses or as collaborations between two houses, and have been well attended after special attention has been paid to designing the advice nights around clinical schedules and exams. Through planning these events, a lesson learned has also been incorporating clinical students into leadership roles to obtain their perspective. Increased engagement of senior clinical students by student led initiatives has also promoted a wider representation of students involved in more formal curriculum-based near-peer teaching. Involvement in near-peer teaching has been shown to be an effective means of reinforcing the experiences of upperclassmen and improving teaching skills among more advanced students1.Discussions and conclusions/Significance: Many in undergraduate medical education have noted the problem of declining engagement of upperclassmen due to a variety of factors. Increased engagement of third and fourth years can provide valuable opportunities for first and second years to network with their future colleagues and ease anxiety at important transition points, all while promoting medical school unity and identity.Reflection: Student driven initiatives offer both clinical and preclinical students valuable opportunities to interact in a vertical integration model, in addition to opportunities for vertical integration more formally scheduled by faculty.References: 1. Evans DJR, Cuffe T. Near-peer teaching in anatomy: an approach for deeper learning. Anat Sci Educ. 2009;2(5):227-233. doi:10.1002/ase.110.

Poster F-40: An Examination of Study Habits and Performance on the USMLE Step 1 Exam Among 2nd Year Medical Students at the University of Vermont College of Medicine

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Purpose/Problem Statement: The United States Medical Licensure Exam (USMLE) Step 1 is the first component of the USMLE, taken by medical students following their second year of medical school. This exam is a core component of a student's application to residency. To date, research has focused the correlation between Step 1 scores and student performance in basic science courses, commercial coaching courses, and Master of Science programs. However, little has been published about the impact of duration of Step 1 preparation, resource utilization, self-care and wellness, and anxiety on exam performance. The purpose of our investigation is to identify study patterns, resources, and self-care activities during designated study months and to examine their relationship to exam performance.Methods/Approach: A total of 5 bi-weekly 7-question surveys were administered to second-year medical students from the class of 2017 at the University of Vermont from early February to mid-March. A final survey was administered after completion of Step 1 . Bi-weekly surveys assessed time spent studying, self-care activities, and self-reported anxiety. The final survey collected responses related to study resources used, student perception of appropriate study time, student perceived preparedness, exam day anxiety, and open ended responses for advice to future classes. Responses were analyzed comparing the factors assessed through surveys to pre-clinical grades, performance on the Comprehensive Basic Science Self-Assessment and USMLE Step 1 score. Open ended response questions were analyzed thematically to assess common reflections and advice for future classes.Results/Lessons learned: 95 students participated in the final survey for an overall response rate of (83%). 111 students participated in at least one of the periodic surveys. The final survey demonstrated that 75% of students felt there was enough or more than enough time to study. On average students recommended studying for 10 weeks. The top three resources included UWorld (90%), First Aid (70%), and Pathoma (39%). Student self-rated exam-day anxiety showed no correlation with exam performance. Thematic analysis applied to open ended question responses revealed common themes around the importance of adhering to a study schedule, acknowledging the amount of study time, and self-care through exercise, sleep, and social supports. Multiple students provided brief anecdotes on the utility of the survey as a tool for self-reflection during the study period. Additional analyses are underway to further explore the relationships between resources used for studying, average anxiety across the study period, self-care activities and frequency, and exam performance .Discussions and conclusions/Significance: The results will attempt to address the following questions: does the use of certain study materials correlate with Step 1 scores? Are specific study practices, including self-care and study hours related to greater score improvement between CBSSA and Step 1? Are there recommendations that we can make to future classes about how to approach Step 1 to reduce anxiety and improve exam performance?Reflection: To date few studies have compared student resources used, time in weeks spent studying, self-reported anxiety, and self-care on USMLE Step 1 performance. Preliminary analysis of results demonstrates no relationship between exam day anxiety and exam performance and that students generally agree that 10 weeks provides an adequate study period. Qualitatively, self-care played an important role in exam preparation. Analysis of self care activities, self-related anxiety throughout study period, and resources used is underway and will provide an additional perspective regarding possible recommendations for future classes approaching the USMLE Step 1 exam.References: Burns ER1, Garrett J. Student failures on first-year medical basic science courses and the USMLE step 1: a retrospective study over a 20-year period. Anat Sci Educ. 2015 Mar-Apr;8(2):120-5. Fredieu JR1, Snyder CW. Positive impact of a master of science in applied anatomy program on USMLE Step 1 performance. Anat Sci Educ. 2015 Jan-Feb;8(1):31-6. Werner LS1, Bull BS. The effect of three commercial coaching courses on Step One USMLE performance. Med Educ. 2003 Jun;37(6):527-31.

Poster F-41: Service-learning and community-engaged scholarship in undergraduate medical education - key attributes for success and sustainability in the 21st century

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Purpose/Problem Statement: The Liaison Committee on Medical Education (LCME) states that "an institution that offers a medical education program should make available sufficient opportunities to participate in service-learning activities and should encourage and support medical student participation. The LCME defines "service-learning" as a "structured experience that combines community service with preparation and reflection." Service-learning has the potential to promote many of the competencies and skills that address 21st century challenges in the education of health professionals that are difficult to achieve in traditional classroom and clinical settings including civic engagement, citizenship, an understanding of population health and social determinants. Service-learning has demonstrated effectiveness in teaching cultural competence/humility, advocacy and team work, and in fostering altruism. Service-learning offers young adults developmentally appropriate channels for leadership, and opportunities to develop relationships and contribute to communities outside of a homogeneous community of peers. The value of service-learning and other community-engaged experiences to create physicians that are value-driven and community responsive is recognized by traditional medical schools and by new medical schools whose primary mission is to address physician shortages for specific populations and/or geographic targets. However, service-learning competes with an ever-expanding list of requirements for the finite "real estate" on medical students' curriculum.Methods/Approach: In order to answer the question what are the key attributes for success and sustainability for service-learning programs in UME in the 21st century? we carried out a literature review and conducted key informant interviews of knowledgeable stakeholders at traditional and newer medical schools. Based on our literature review and thematic analysis of the interviews, we identified the following key attributes:Results/Lessons learned: The scholarship of engagement must be a clearly articulated in the school's strategic vision, with enthusiastic support from the school's leadership. This scholarship connects discovery, integration, application and teaching to understanding and solving pressing social, civic, and ethical problems. The school must work towards establishing authentic partnerships with community and public health organizations, accountable to both community stakeholders and to the school's leadership and learners. The school must value experiential learning and provide a range of opportunities for community engagement including robust co-curricular volunteering opportunities, service-learning courses, community- health-relevant programming and research. This tiered mix of experiences should include opportunities for student leadership and longitudinal involvement. Some degree of community engagement should be required of all students, with a menu of options for those who choose to focus on community engagement. The school should have service-learning courses that are able to accommodate all interested students. Service-learning pedagogy acknowledges all participants as learners and incorporates meaningful reflection and evaluation. The school should have a Center or central point of contact that oversees and coordinates all community-engagement activities. Adequate resources in including dedicated funding for community-engagement, particularly service-learning is necessary in order to support this type of teaching that is time-intensive. In order to plan and teach across the range of community-engaged activities, Faculty must be trained in these teaching modalities, including service-learning pedagogy. In order to support and provide incentives for faculty to be community-engaged, promotion and tenure policies and criteria must recognize community engagement, with appropriate metrics that are parallel and equal to more

traditional criteria. Outcomes must be tracked and measured, and appropriate program improvements be designed. Educational outcomes include student knowledge, attitude, and values. Community outcomes include measures of substantive and transformative changes as defined by community stakeholders, reflective of their goals and objectives. These might include infrastructural outcomes such as pipeline programs that expand educational opportunities; jobs for community members - both entry level and higher level; community access to campus-based resources, and a community presence within the academy - participation in research projects, IRBs, and co-teaching.Discussions and conclusions/Significance: These findings will add to medical school's understanding of service-learning and community-engaged scholarship and contribute to their ability to develop and sustain these programsReflection: Traditional medical schools and innovative newer medical schools both have valuable strategies and best practices that can contribute to the development of sustainablecommunity-engaged scholarship and service-learning programs.References: 1. Seifer, SD. Service-learning: Community-Campus Partnerships for Health PRofessions EDucation. Acad Med. 1998. 1998; 73(3): 273-277 2. Carnegie Report. (February 2006). Higher education: Civic mission & civic effects, Washington, DC: Carnegie Foundation for the Advancement of Teaching and the Center for information and Research on Civic Learning and Engagement (CIRCLE). 3. Hunt JB, Bonham C, Jones L. Understanding the goals of service learning and community-based medical education: a systematic review Academic Medicine, 2011 - journals.lww.com.

Poster F-42: You Mapped Your Curriculum – Now What? Developing, Sustaining and Effectively Using a Curriculum Map

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Purpose/Problem Statement: This presentation will provide a comparative overview of three innovative and unique approaches to curriculum mapping. The benefits and challenges associated with implementing each of the approaches will be described, along with a review of lessons learned and the emerging best-practices that allow all stakeholders to use products of an effectively designed and maintained curriculum map. Need for Innovation/Practice: Nearly every medical school undertakes some form of curriculum mapping. They do so for school-specific reasons, including curriculum review, management and development; and for reasons common to all, such as compliance with accreditation requirements and participation in the AAMC Curriculum Inventory. At best, maps elucidate the key relationships and structures of the curriculum, including learning objectives, instructional methods, keywords and assessments. By making the “architecture” of the curriculum visible through mapping, it becomes a practical and useful tool for curriculum administrators, faculty, students, accrediting bodies, educational researchers and others. The extent of the utility of a curriculum map depends on a variety of factors including how the map is developed, who maintains it, where it lives, and its perceived value to the stakeholders. The specific processes by which schools map their curricula vary widely. Some institutional approaches to mapping are primarily administration-based, whereas others are student-driven, faculty-based, librarian-led, or a hybrid version that includes some or all of these approaches. This variety of methods allows schools to complete mapping in a way that is customized to their specific needs and constraints.Methods/Approach: This presentation will share the benefits and constraints for each of three curriculum mapping models: a faculty-based mapping approach in which faculty served as the primary creators of a school-wide map that linked course objectives, session objectives and assessments to program-level objectives, and individual sessions to keywords; an administration-based approach led by the Office of Medical Education and reviewed and validated by the teaching faculty; and a librarian-led effort to maintain a map created initially through a collaboration of course directors, medical educators and librarians.Results/Lessons learned: Drawing on the experiences of three schools’ varied approaches to curriculum mapping, participants will learn about the benefits and challenges associated with each of the three models. Strengths and Areas for Improvement: The downside of the heterogeneity of mapping techniques is that sharing best practices and lessons learned from curriculum mapping can be very difficult. The issue is compounded by differences in how schools maintain, update and adapt their maps as needs and technology change. There also has been little discussion to date regarding the perceived and real utility of curriculum mapping, both by the mappers and those who use, or who have the potential to use, the products of a thoughtfully developed and maintained map. This review of three distinct mapping methods compares and contrasts the benefits and limitations across them.Discussions and conclusions/Significance: -Reflection: Feasibility of Program Maintenance/Transferability: Because most curriculum mapping methods encompass one or more of the three approaches discussed, schools will be able to choose which are best suited to their educational culture.References: 1. Harden RM. AMEE Guide No. 21: Curriculum mapping: a tool for transparent and authentic teaching and learning. Medical Teacher. 2001;23(2):123-137. 2. Ellaway RH, Albright S, Smothers V, Cameron T, Willett T. Curriculum inventory: Modeling,

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Poster F-43: Medical Student Evaluation, Beyond Multiple Choice Assessments, A Twenty Five Year Perspective

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Purpose/Problem Statement: Background A summative assessment (SA) consisting of a narrative and numeric student evaluation system for interactive group exercises was established for the Pathology/Pathophysiology (P/PM) program at our institution, twenty-five years ago. The objectives were to add a multiple choice examination (MCE)-independent assessment to the evaluation of our students and to create a mechanism to gauge the “level of connectedness” between faculty and student groups. The program structure emphasizes interactive exercises and guided self-study assignments (36% and 40% of course time, respectively). The group exercises are of two types: clinico-pathological correlation and problem-solving exercises with 20 and 10 students per group, respectively. Our teaching program consists of two sequential semester courses, thus providing four SAs for each student.Methods/Approach: Methods Student groups are created with an even distribution of strong, average and weak students based on the cumulative first-year medical student grade point average (MS-1 GPA). The initial balanced numeric consistency of the group allows the establishment of a standardized grading system, with uniform group mean grade values. Faculty is not privy to the MS-1 GPA or the MCE results, ensuring independent assessment of each student. Faculty members are assigned to specific groups for the entire duration of the academic year. Mandatory attendance at all group exercises is required. Faculty receptiveness, cooperation, and commitment permit incorporation of a standardized grading system, a critical element allowing for weighting and standardization of the numeric component of the SA as a percentage of the final course grade. The three components of the SA consist of: 1. four of the current six ACGME core competencies, i.e., medical knowledge, interpersonal skills, practice-based learning, and professionalism, assessed using a Likert scale; 2. a narrative assessment; and 3. a numeric grade consistent with both core competency evaluation and narrative assessment.Results/Lessons learned: Results The SAs have found broad acceptance among faculty and students. The numeric component of the SAs assumes a respected importance in the computations of the final grades of the first and second semester (15% and 25%, respectively). The validity of the standardized grade mean requirement for all groups has been verified by periodic correlation of the groups’ exercise grade means with the respective group means obtained in MCEs, including board-type subject examinations. While the exercise group means by requirement are identical for all groups, intra-group discrepancies between exercise grades and MCE grades are not uncommon. Follow up discussions conducted by faculty with students having received low first course SAs were found to foster subsequent improvement in the performance of on average between 35% and 45% of such students.Discussions and conclusions/Significance: Conclusion The SA component of the student evaluation in the P/PM program at our institution represents a MCE-independent student evaluation aimed at assessment of core competencies, student engagement, active learning, critical thinking, and

professional development, predating the current LCME standards. Consistent faculty-student contact permits an ongoing student assessment by faculty surpassing assessments based exclusively on MCE results. The ultimate relevance of this evaluation approach lies in the focused preparation of students for a higher level of functioning in their clinical training while in a “secure and nurturing“ learning environment.Reflection: What is the correlation the student performance and summative assessment int he second year of medical school with that of the third and fourth years?References: Alison Rushton (2005), Formative Assessment A Key to Deep Learning, Medical Teacher, Vol. 27, No. 6, 2005, pp. 509-513. Sally Schwab, Ph.D (2011) Characterisitcs of Constructive Feedback; Adapted from Kaprielian, VS, & Gradison, M. Effective Use of Feedback. Family Medicine, 1998; 30(6): 406-407. Kassebaum, D G; Eaglen, R H, Shortcomings in the evaluation of students' clinical skills and behaviors in medical school. Academic Medicine: July 1999, Journal Article: pp. 842-849.

Poster F-44: Why Do I Need to Know This? The Value of Simulation in Contextualizing the Basic Sciences for Early Learners

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Purpose/Problem Statement: The integration of basic, clinical, and social sciences into undergraduate medical education has gained importance as reflected by curricula at some medical schools (1) and the desire of educators for novel methodologies for accomplishing this goal (2). Importantly, an enduring challenge with integration is to avoid diminishing the relevance of the basic sciences for early learners (3).Methods/Approach: At Hofstra North Shore-LIJ School of Medicine, we have developed a model for an “integrated biomedical and clinical sciences debrief” for first and second year medical students following high technology mannequin simulation experiences. As a means of integrating basic and clinical sciences in an applied setting, small groups of students participate in two team-based simulation scenarios at the end of each of our integrated courses. The two scenarios allow students to compare and contrast similar acute clinical presentations of illnesses with different underlying pathophysiology that were previously explored through case-based learning, large group sessions, and clinical skills exercises. Following the simulation, a physician, a basic scientist, and a simulation nurse specialist engage students in a 40-50 minute integrated biomedical and clinical sciences debrief. Facilitators prompt discussion of the application of basic sciences to the patients’ clinical presentations, interpretation of diagnostic testing, and/or therapeutic management. Through debriefing, students synthesize content learned in a variety of venues and “experience” the rationale for learning the basic sciences related to the clinical care of their simulated patients. In this way, students observe the foundational role of biomedical science in clinical medicine.Results/Lessons learned: 1. Simulation with an integrated biomedical and clinical sciences debrief is an excellent option for session level integration that can be used with early learners. 2. Integrated biomedical and clinical sciences debriefs is an effective way for students to understand the clinical relevance of the basic sciences. 3. Simulation with integrated biomedical and clinical sciences debrief helps prepare students for exams in an integrated curriculum. 4. Simulation debriefs must be carefully planned and require the buy-in from all faculty participants to ensure a balanced discussion of both biomedical and clinical sciences. 5. An unintended, but positive outcome has been that faculty facilitators feel that participating in these sessions better prepares them for their role as educators in an integrated curriculum.Discussions and conclusions/Significance: Although the importance of integration and the role of clinical simulation in undergraduate medical education are well recognized, there is little literature that describes a method of holistically integrating basic and clinical sciences into high fidelity simulation.Reflection: We view simulation linked to integrated biomedical and

clinical sciences debrief as an emerging educational opportunity that offers session level integration and can be utilized with early learners to allow them to understand the application of basic science principles to patient care.References: 1. Ginzburg, S., Brenner, J., Willey, J. Integration: A Strategy for Turning Knowledge into Action, Med Sci Ed. 2015 (DOI) 10.1007/s40670-015-0174-y. 2. Kulasegaram KM et al. Cognition before curriculum: rethinking the integration of basic science and clinical learning. Acad Med. 2013; 88: 1-8. 3. Brauer DG, Ferguson KJ. The integrated curriculum in medical education: Med. Teach. 2015; 37: 312-322.

Poster F-45: Building an Information Literacy Skill Set: Blending a 4C/ID and Flipped Classroom to Introduce Clinical Questions and Evidence Retrieval

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Purpose/Problem Statement: The ability to form clinical questions and retrieve evidence to advance patient care is considered a core entrustable professional activity (EPA) for entering residency. To address this EPA early on in the undergraduate medical curriculum, a longitudinal informatics theme focused on information literacy and evidence based medicine was introduced to first year medical students. Themes focused on generating clinical questions, effectively navigating and acquiring relevant literature, and appraising literature to advance patient care. Students recognized that the content was important but the instructional sessions were fragmented and did not demonstrate the inter-relatedness of information, its medical applications and it was taught out of the context of patient care or research.Methods/Approach: Using elements of the Four Component Instructional Design Model (4C/ID), we implemented a flipped classroom session to introduce students to information literacy and demonstrate its application to medicine. Pre-class tutorials were assigned. The introductory tutorial provided basic background information explaining the structure of PubMed and its relationship to MeSH vocabulary. Three additional asynchronous on-line tutorials demonstrated procedural strategies that could be used to search PubMed or other biomedical databases. All tutorials included built-in real time assessments that allowed students to interact with the tutorial as well as identify areas of weakness. The session was moved to small group classrooms which allowed instructors to provide one-on-one guidance at the individual point of need. Class time focused on students developing clinical questions based on pre-fabricated clinical vignettes, applying the skills learned in the tutorials to located relevant literature to answer their clinical question and group discussion of their search strategy.Results/Lessons learned: Information resources change rapidly but the overarching literacy skills remain the same. Using this approach allowed us to focus on developing an information literacy/Evidence Based Medicine skill set that has long-term application rather than utilizing class time to demonstrate procedural details that quickly become out of date. Students were able to practice using the skills associated with forming clinical questions and retrieving evidence in a single session. Since the session was moved out of the lecture hall, student attendance was no longer optional resulting in all students receiving information literacy instruction. 67% of students watched and completed the tutorials the day of the in-person session. Therefore the data from the assessments was not available in time to modify the event based on skills identified as deficient. Students liked immediate feedback that was built into the mini-assessments and appreciated the short tutorials.Discussions and conclusions/Significance: As this approach brought together the many themes in the longitudinal informatics curriculum, it allows students time to practice and refine the skills to become proficient in EPAs. This session demonstrates how a 4C/ID approach can be employed to teach the complex skills associated with information literacy to first year medical students. More assessment is needed to determine if the skills taught are being carried forward into coursework and early clinical experiences.Reflection: Information not available at current timeReferences: Maggio LA and JY Kung. How are medical students trained to locate

biomedical information to practice evidence-based medicine? a review of the 2007–2012 literature. J Med Lib Assoc 2014; 102(3): 184-191. Maggio LA, Cate OT, Irby DM, O'Brien BC. Designing evidence-based medicine training to optimize the transfer of skills from the classroom to clinical practice: Applying the four component instructional design model. Acad Med. 2015;90(11):1457-1461. Youngkin CA. The flipped classroom: Practices and opportunities for health sciences librarians. Med RefServ Q. 2014;33(4):367-374.

Poster F-46: Gaming in the Histology Laboratory

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Purpose/Problem Statement: PROBLEM: How to best present microanatomy/histology has long been recognized as a major problem in medical education.(1) In 2015 The FASEB Journal devoted a large portion of a supplemental issue to the subject.(2) While our students generally do rather well on our exams, my personal observations find the histology laboratory lacking in fun and excitement. In an effort to make the laboratories more exciting, an interactive histology game, HistoGame, was introduced.Methods/Approach: Virtual microscopes and a web based clicker system were used as a starting point for implementing HistoGame. Software was written to cumulatively maintain student responses to real time notations made on the virtual histology slides. Algorithms in the software program gave greater weight to correct answers answered more quickly than slower correctly answered questions. At any time students could see their HistoGame scores and ranking within the laboratory. Student attitude toward HistoGame was evaluation by Likert based anonymous survey, conducted at the end and after prizes & ribbons for high scores and certificates to all for successful participation were awarded.Results/Lessons learned: The anonymous Likert scale based survey revealed very favorable student attitudes to HistoGame: I look forward to participating in the Histo Game: Likert mean 4.2 (1= Strongly Agree, 5=Strongly Agree) distributed as: 1=0; 2=1; 3=4; 4=7; & 5=11. Rate the idea of adding the histogame to the histology laboratory: Likert mean 4.2 distributed as: 1=0; 2=0; 3=7; 4=5; & 5=12. Specific comments volunteered by students indicate that HistoGame made the laboratory fun & exciting and helpful in learning microanatomy; however, there were some negative comments. The specific comments include: fun and helpful. | It tests our knowledge so we know where we are in learning the material. | it is entertaining and it helps me with learning | I like games. | encourages participation | It is fun. | adds some more excitement| keeps us on task | being able to share an answer and get immediate feedback | Good idea It encourages participation. | Penalized for taking time to think | Speed of response is included in how you get points. | It will make lab more competative | makes me afraid to give a wrong answer-- as long as it is not linked to evaluations | The [Aperio] software is already buggy and I don't like the idea of having to interact with it more or be judged by elements that are out of my control. Both before and after HistoGame student performed very well on course ending examination, thus there was no observed improvement in the already high student performance. A concern is the possibility that a sense of competitiveness would decrease peer interactions. Accordingly rather than have individual players, in future play should use groups competing against the other groups with the hope that it will increase student interaction within the individual group. Course directors did not share in student enthusiasm for HistoGame and they concluded HistoGame was unethical (3).Discussions and conclusions/Significance: HistoGame can transform histology learning laboratories into a fun experience and provide students with continuous, real time evaluations of their learning progress.Reflection: Gaming between student groups should foster peer learning as well as transforming laboratories into exciting learning experiences.References: 1 Cowdry, E. V. Teaching of histology. J. Assoc. Am. Med. Col., 11:3-

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Poster F-47: When in Rome. . . Influences on student perceptions of the pharmaceutical industry

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Purpose/Problem Statement: The American Medical Student Association (AMSA) and the Pew Charitable Trusts publishes a scorecard grading medical schools' policies governing student and faculty member interactions with the drug and device industry.1 To create a consensus policy for our new community-based medical school, we sought to explore students' and faculty members' experiences with, and perceptions of, the drug and device industry. Our hypotheses included: (1) Community-based clinical faculty members would have more interaction with, and a more favorable opinion of, drug and device industry representatives (reps) than medical students. (2) Medical student perceptions of these reps would be influenced by the perceptions of the community-based clinical faculty members' with whom the students work.Methods/Approach: In August through October 2015, the authors surveyed 2nd- and 3rd-year Netter School of Medicine students, core full-time faculty, and community-based clinical faculty members about their interactions with and perceptions of reps in their office based practices. The authors used descriptive statistics, chi-square, and Kruskal-Wallis tests to analyze the data and assess differences between groups.Results/Lessons learned: Eighty-five students, 18 core full-time faculty members, and 56 community-based clinical faculty members completed the survey (response rates were 59%, 75%, and 37%, respectively). Demographic characteristics of community-based clinical faculty who responded to the survey were compared with those who did not respond to the survey and were not found to be significantly different (all p-values >.05). Thirty-nine percent of students reported receiving food or beverage from a rep in the past year, compared with 61% of community-based faculty members and 0% of core full-time faculty ($p<.001$). All of the students receiving food or beverage from reps did so while engaged in a longitudinal ambulatory preceptorship with a community-based primary care physician while in the first or second year of medical school. Figure 1 shows the extent to which each of these three groups agreed or disagreed with several statements about the appropriateness of interactions with reps and the necessity of medical school policy to govern these interactions. Differences between groups were significant ($p<.01$) for all statements and the core faculty significantly differed from students and clinical faculty on every statement (all p-values <.05), but the students and clinical faculty only differed on whether it was appropriate for medical students to accept gifts or food ($p=.001$) and whether there is too much public scrutiny of interactions with pharmaceutical companies ($p=.005$).Discussions and conclusions/Significance: The vast majority of respondents, regardless of group, felt that a conflict of interest policy should be developed for the school, but the groups disagreed about how restrictive this policy should be. Core faculty favored the most restrictive polices, whereas clinical faculty were least supportive. Notably, students landed squarely in the middle of these two influential faculty groups. This data is highly suggestive that community based clinical faculty may have as much, if not more, influence on students' perspectives as core faculty members. If core faculty want students to be aware of the evidence surrounding how drug and device industry representatives influence physician prescribing habits, they will need to find ways to introduce this material in the formal student curriculum and in faculty development, as it will certainly be part of the students' hidden curriculum if they do not. Limitations of this study are the response rate amongst our community-based faculty; notably respondents were demographically no different than the full group of community-based faculty. In addition, our study was not designed to assess how student perceptions are specifically influenced by their longitudinal ambulatory preceptorships but this provides a future avenue for qualitative

study.Reflection: N/AReferences: AMSA PharmFree Scorecard 2014. Conflict of Interest Policies at Academic Medical Centers (online), amsascorecard.wpengine.com, Reston, VA: American Medical Student Association, November 25, 2015.

Poster F-48: Teaching Medical Students About Forensic Evaluations of Asylum Seekers: Five Clinical Models

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Purpose/Problem Statement: By the end of 2014, 19.5 million refugees and 1.8 asylum seekers were displaced worldwide, due to ongoing conflict, violence and human rights abuses. Physicians are uniquely qualified to use their training to assist members of this vulnerable population. Regardless of specialty interest or stage of training, students often display interest in global human rights issues and desire an introducation to providing expertise to this vulnerable and growing population. We will present the advantages and disadvantages of medical student involvement in the following settings: in a small exam room with one to two students, in a medical simulation center with up to eight students, in a discussion group, in a detention center, and in a classroom. Students and residents who participate in these evaluations often hear about disturbing incidents. We will present the need to provide emotional support before and after the appointment. Finally, physicians perform these examinations as objective medical evaluators and do not provide care for asylum seekers. It is important to emphasize this role for students who are more familiar with a role of medical caregiver.Methods/Approach: The poster will show the specific characteristics of this population of people seeking asylum in the United States, and demonstrate how physicians are uniquely positioned to use their expertise to help vicitms of alleged torture. It will contain information about advantages and disadvantages of each clinical teaching setting, from the perspective of the asylum seeker and the medical student. The poster will also provide data about ideal ways to support students as they hear often harrowing stories of alleged persecution. Finally, information will be provided about the different roles that a physician provides as an expert witness instead of a medical caregiver.Results/Lessons learned: Each clinical scenerio in which asylum seekers are evaluated offers unique advantages and disadvantages. The small exam room provides the most direct interaction, but the asylum seeker often prefers as few people in the room as possible. The medical simulation room offers the opportunity to provide this clinical experience to many more students, and allows the asylum seeker to sit in a room with fewer observers, but the students' did direct contact is less. Evaluating asylum seekers in detention requires a greater time commitment from students, but offers the unique visceral experience of spending time in a prison-like instiutional setting to perform the evaluation. Only one student at a time can participate in detention evaluations. Large groups of medical students are able to listen to a person who has been granted asylum discuss the process of seeking and receiving asylum. These discussion are free-flowing, but lack the immediacy of an initial forensic exam. Formal curriculum offers the ability to present asylum medicine as part of a medical school curriculum but does not allow for actual clinical interaction.Discussions and conclusions/Significance: Many medical students wish to learn about asylum seekers and how they, as future physicians, can use their clinical expertise to become involved in medical forensic evaluations. They need clinical opportunities to demonstrate the role they can play in performing these examinations. As asylum seekers can be re-traumatized when recounting their alleged trauma, they benefit from clinical settings with minimal observers. Students who observe need mentoring and emotional support after hearing often harrowing stories of alleged torture.Reflection: Different models of teaching about medical forensic evaluations vary based on the preference of the asylum seeker and their unique circumstances. Medical schools should offer a variety of formats for students to learn about the intellectually and emotionally demanding field of asylum medicine.References:

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Poster F-49: Assessing the Pediatric Teaching Resident's Work Rounds Performance

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Purpose/Problem Statement: Resident teaching skills have been highly regarded and their teaching effectiveness is revealed in clinical settings. Teaching Residents (TR) in their third-year rotation were evaluated measuring teaching performance during the authentic bedside practice settings of work rounds. The literature showed essential content when teaching others, yet lack description of the TR role in various didactic and clinical settings (e.g., small group teaching in patient-centered work-rounds, team leadership, giving feedback, etc.). These are valuable skills essential for their professional development. We conducted an assessment of Pediatric Teaching Resident ability to teach residents and students during work rounds.Methods/Approach: An assessment instrument was analyzed for reliability during each of the one-month TR rotations. Our prospective (non-blinded) study was conducted from 2014 to 2015 in a large academic center Pediatrics Department by direct observation of resident work-rounds performance.Results/Lessons learned: Cohen's Kappa assessed inter-rater reliability as satisfactory (K = 0.74) by faculty observed ratings (n= 11) during resident's work rounds. Descriptive findings indicate higher scores for establishing a learning environment and teaching skills or role-modeling. Qualitative analysis identified common themes from the TR self-reflections: Impacts (improved teaching, communication skills, self-confidence and medical knowledge); Barriers (time constraints, inadequate education knowledge); Teaching Concerns (motivating learners, giving feedback) and Curriculum Improvement (learning needs and styles).Discussions and conclusions/Significance: Pediatric Teaching Residents provide important work-round skills when teaching peers and students while preparing for professional roles in academic settings.Reflection: Ongoing assessment using our validated TR work rounds instrument will imporve Milestone achievements and collaborative learning in family-centered rounds. Further analysis will aid faculty in cliinical assessment of Teaching Residents as they prepare for independent practice.References: Fromme HB, Whicker, SA, Paik S, Konopasek L, Koestler J, Wood B, Greenberg L. Pediatric resident as teacher curricula: A national survey of existing programs and future needs. J Grad Med Ed. June, 2011; 7 (2): 168-175. Post RE, Quattlebaum G, Benich JJ. Residents as teacher curricula: A critical review. Acad Med. March, 2009; 84 (3): 374-80. Norgaard K, Ringsted C, Dolmans D. Validation of a checklist to assess ward round performance I internal medicine. Med Educ. 2004; 38:700-7. Scott JR and Medio FJ. Resident teaching skills courses: What is the evidence for effective instruction? J Grad Med Ed. September, 2008; 19-23.

Poster F-50: Use of Novel High-Yield Laboratory Demonstrations in a BS/MD Clinical Anatomy Course

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Purpose/Problem Statement: There is debate in the literature regarding the best strategy for medical students to learn clinical anatomy in the gross anatomy laboratory. A decrease in anatomy contact hours coupled with limited accessibility and high cost of obtaining cadavers has fueled this debate. As part of a curriculum reform, the BS/MD clinical anatomy course at the CUNY School of Medicine was completely redesigned in 2015 and along with traditional dissections, included using novel high-yield laboratory demonstrations (HYLDs). The purpose of this study is to describe and report student perceptions of HYLDs so that other programs can potentially adopt this learning strategy. The HYLDs were created based on adult learning theory (constructivist model).Methods/Approach: A class of BS/MD students (N=61) was divided into 6 small groups. Each HYLD included 6 stations with a demonstrator (4 clinical anatomists, 2 medical students) at each station. Each group spent 20 minutes per station (2-hour lab session) and then rotated to the next station. Demonstrators facilitated active learning by interacting with the students and allowing them to ask questions. By the end of the session, all groups rotated through 2 osteology, 1 cross-sectional anatomy (using an online program, NetAnatomy), 1 radiology, and 2 embalmed-cadaver (prosection) stations. The prosection and radiology stations were facilitated by physicians and the osteology stations by medical students. An anonymous and voluntary post-course survey (quantitative and qualitative) was used to measure student perceptions of HYLDs. The survey consisted of 8 Likert-style items and an open-ended item where students provided perceptions about HYLDs. Based on agreement level, the 8 items were quantitatively analyzed and open-ended responses were qualitatively analyzed to identify themes.Results/Lessons learned: The survey response rate was 97%. The majority of students reported they learned clinical anatomy as a result of HYLDs (93.22% strongly agreed/agreed) and its many facets (osteology, cross-sectional anatomy, radiology, and prosections) (96.61% strongly agreed/agreed). The majority reported the time allotted for each station was adequate (86.21% strongly agreed/agreed) and they remained alert during HYLDs (88.13% strongly agreed/agreed). For survey reliability, some items were negatively phrased. For example, the majority (94.91%) strongly disagreed/disagreed with the statement, “I believe I did not learn during HYLDs.” And 93.22% strongly disagreed/disagreed with the statement, “I believe the lab sessions were not high yield at all.” Related to teaching, 96.55% strongly agreed/agreed that demonstrators were essential in helping them learn anatomy. Over half the sample (40/59 students) responded to the open-ended item and qualitative analysis of their responses revealed the following themes: (1) students felt HYLDs were more useful when they read the material and were prepared before the session, (2) the physician and medical student demonstrators made them think, and (3) the clinical correlates reviewed at each station highlighted clinical anatomy. At the end of the course, the class was required to take the NBME shelf examination (paper version) in Gross Anatomy and Embryology. The mean score of the class was 526.7 (the national mean for academic years 2011-2013 was 505). Forty-one students (67% of the class) scored 500 or higher and four students (6.5% of the class) scored 710 and higher, which translates to the 97th percentile and higher.Discussions and conclusions/Significance: n/a because we are submitting an innovation.Reflection: The majority of BS/MD students responded that HYLDs helped them learn clinical anatomy and its different facets (especially cross-sectional and radiologic anatomy). HYLDs were considered important learning strategies by the majority of the class. MD programs can evaluate whether HYLDs can be incorporated into their anatomy courses.References: Collins, T.J., Given, R.L., Hulsebosch,

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Poster F-51: Observation and Uncertainty in Art and Medicine: A Mixed Methods Assessment of Course Outcomes

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Purpose/Problem Statement: Visual art is being increasingly used in medical education to achieve various educational objectives. A museum-based visual art elective course, Observation and Uncertainty in Art and Medicine, was offered to first-year students in two New York City based medical schools. In this study, we performed a two-year quantitative and qualitative assessment of the course.Methods/Approach: Twenty-three first-year medical students from Columbia University and Weill Cornell were enrolled in an art and medicine course taught at the Metropolitan Museum of Art. The course, led by an art educator experienced in medical education, consists of 6 two-hour sessions with explicit objectives of improving observation skills, enhancing awareness of cognitive biases, and strengthening an appreciation for tolerance of uncertainty. Students complete a pre- and post-course Groningen Reflection Ability Scale (GRAS), Implicit Association Test (IAT), and Tolerance for Ambiguity (TFA) scale. All students complete narrative post-course evaluations, which have been coded and thematically analysed by study investigators.Results/Lessons learned: Pre-post analysis showed a statistically significant improvement in the GRAS (GRAS score increased from 87.8 to 90.5, $p<0.05$), with a medium effect size of $d= .38$. Responses to the TFA and IAT scales did not change significantly. In qualitative analysis, the following themes emerged: 1) enhanced observation skills (slow looking); 2) improved skills of perception (emotional engagement and self-awareness); 3) expanded ways of thinking (biases and tolerance of uncertainty); 4) awareness of need for self-care (appreciation of beauty, pleasure, and life balance); 5) recognition of importance of the team process (multiple points of view).Discussions and conclusions/Significance: Reflective ability improved after the intervention. Qualitative analysis revealed enhanced appreciation of several domains central to medical education: observation, self-care, and team process. In addition, students noted increased awareness of biases and need to tolerate uncertainty. Limitations include the small sample size that may have impacted ability to see significant changes on two of the outcome scales. Incorporating visual art into medical education is a promising pedagogical method for addressing several competencies central to training. Further research and curricular expansion is needed in this field.Reflection: N/AReferences: Amiel J, Armstrong-Coben A, Bernitz M, Glickstein J, Gowda D, Graham G, Hermann N, Park C, Taylor D, Charon R. Narrative Medicine. In: Feldman M, Christensen J. Behavioral Medicine: A Guide to Clinical Practice, 4th ed. New York, NY: McGraw Hill. 2014. Katz JT, Koshbin S. Can Visual Arts Training Improve Physician Performance? Transactions of the American Clinical and Climatological Association, 125, 2014: 331-42. Naghshineh S1, Hafler JP, Miller AR, Blanco MA, Lipsitz SR, Dubroff RP, Khoshbin S, Katz JT. Formal art observation

training improves medical students' visual diagnostic skills. J Gen Intern Med. 2008 Jul;23(7):991-7.

Poster F-52: Culinary Medicine: An Innovative Approach to Inter-Professional Nutritional Learning

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References: [i] Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of Childhood and Adult Obesity in the United States, 2011-2012. JAMA.2014;311(8):806-814. [ii] Smith AW, Borowski LA, Liu B, et al. U.S. primary care physicians' diet-, physical activity-, and weight-related care of adult patients. American journal of preventive medicine. Jul 2011;41(1):33-42. [iii] Lenders CM, Deen DD, Bistrian B, et al. Residency and specialties training in nutrition: a call for action. The American journal of clinical nutrition. May 2014;99(5 Suppl):1174S-1183S. [iv] Thomson K, Outram S, Gilligan C, Levett-Jones T. Interprofessional experiences of recent healthcare graduates: A social psychology perspective on the barriers to effective communication, teamwork, and patient-centred care. Journal of interprofessional Care. Jul 31 2015:1-7. [v] Gerber M, Hoffman R. The Mediterranean diet: health, science, and society. British Journal of Nutrition. 2015;113:S4-S10.Session Outline (90 minutes): Introduction to Culinary Medicine Time Allotted: 10 minutes Demonstrate proper knife-holding skills and cutting techniques (i.e. dice an onion, julienne a pepper) Time Allotted: 5 minutes Prepare white bean bruschetta with assistance from audience members Time Allotted: 30 minutes Teams compare and contrast traditional vs. Mediterranean diet versions of the same recipe (i.e. veggie burger vs traditional hamburger, black bean brownie vs traditional brownie) in terms of calorie density and nutrient content during tasting. Time Allotted: 20 minutes Review 3-4 case-based exercise questions Time Allotted: 10 minutes Questions and answers Time Allotted: 10 minutesLearning Objectives: The goal of this workshop is multifold: (1) to introduce the Culinary Medicine concept and objectives, (2) to demonstrate the importance of inter-professional education in the fight against obesity and related diseases, (3) to provide interactive application of basic culinary techniques and principals, (4) to provide examples of healthier menu strategies for patients and healthcare providers that are easily understood and user friendly, and (5) to review case-based questions while tasting snacks and desserts prepared via the traditional versus the Mediterranean diet recipe.Methods/Approach: Obesity is a growing epidemic and problem for the U.S. Greater than one third of U.S. adults are classified as obese. Obesity is not only costly to the U.S. healthcare system, with a total estimated cost of $147 billion in 2008, but it also leads to related conditions, such as diabetes and heart disease, that are principal causes of preventable death.[i] According to Smith et al, U.S. primary care physicians have reported feeling incompetent in advising patients about diet, physical activity, and weight management strategies.[ii] Therefore, the need for an interdisciplinary approach towards patient health is seen in order to better address the obesity epidemic and its related diseases. Various health professionals working together to address obesity improves the efficacy of the healthcare team. Furthermore, the lack of proper diet and weight counseling by physicians may be attributable to the deficit of nutrition education in health professional schools, such as in medical school, nursing school, and residency programs.[iii] Thus, incorporating nutrition early on in the education of future healthcare providers may facilitate a stronger association between the importance of nutrition and the pathology of certain diseases. Additionally, health professional students and providers may develop greater knowledge and confidence in addressing diet and weight management issues with their patients. Accomplishing this feat through a collaborative and inter-professional approach is important as it has been shown that student attitudes toward teamwork are molded early on in education. Since inter-professional education (IPE) is increasingly emphasized in healthcare delivery today, it is important to initiate positive attitudes

on teamwork as early as possible. [iv] Rutgers Robert Wood Johnson Medical has adopted and adapted the culinary medicine curriculum by collaborating with the Rutgers Nutritional Sciences Department from the Tulane University School of Medicine. This curriculum designed by the Goldring Center for Culinary Medicine is the first program to fill the gap of nutritional education in the studies of healthcare professionals. The culinary medicine curriculum is based on the Mediterranean diet and provides students with the ability to actually cook the recipes, which allows them to adopt better dietary decisions themselves and prove to be examples for their patients. The curriculum is strongly evidence-based, as the Mediterranean diet has been studied and scientifically proven to prevent cardiovascular disease, breast cancer, cognitive decline and combat obesity.[v] This is a unique educational opportunity that unites undergraduate nutritional sciences students with medical students in the kitchen. A typical session consists of cooking with recipes, discussing and contrasting the nutritional content of various recipes, concluded by food tasting while discussing clinical case questions, giving students the opportunity to apply their classroom knowledge to clinical cases. The goal of the inter-professional team-based cooking classes is to provide health professional students with a greater knowledge of the importance of nutrition in relation to overall patient health and, thus, better preparation for health counseling and a deeper appreciation for a collaborative approach to combat obesity and obesity-related diseases.

Poster F-53: The New Primary Care-Population Medicine Dual Degree Program at Brown University - Creating the Workforce We Need to Achieve the Triple Aim

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Purpose/Problem Statement: The United States healthcare system has been in a period of rapid evolution over the past decade; a trend which is anticipated to continue for the foreseeable future. Physicians are increasingly being held accountable not just for the patient in front of them, but also for the outcomes, quality, and cost of care for their patient panels, communities, and populations. Current medical education curricula rarely provide sufficient preparation in the competencies needed for meeting the Triple Aim1 or in being leaders beyond the walls of their individual practices or institutions. While a number of institutions have begun to incorporate specific innovative experiences into medical school, there continue to be strong calls for more widespread adoption of these ideas and the creation of new programs.2,3Methods/Approach: The Alpert Medical School of Brown University (AMS) developed the dual degree MD-ScM Primary Care-Population Medicine (PC-PM) program in response to rapid changes in the US healthcare system, the need for physicians trained in the care of individuals, families, communities, and populations, as well as the projected shortage of primary care physicians. The PC-PM program builds upon the traditional curriculum with major integrated curricular innovations throughout medical school: (1) Master of Science Degree in Population Medicine that requires students to take nine additional courses over four years, complete a thesis project focused on an area of Population Medicine; (2) significant leadership training; (3) Longitudinal Integrated Clerkship (LIC) during the 3rd year of medical school in which the students complete a longitudinal outpatient experience with the same preceptors and patients. During the LIC students will follow a panel of patients wherever care is provided, while focusing on population health and healthcare delivery issues in addition to medical topics throughout their clinical and didactic experiences; and (4) Primary Care residency positions in Family and Internal Medicine at Brown are being held for a portion of the class and it is hoped the graduates will be the clinician leaders and scholars of the future.Results/Lessons learned: Innovative elements of the program were piloted in 2013-2015 and the inaugural class of 16 students started in August 2015. Initial reactions by students have been very positive and several elements of the program

related to population health and leadership have already been instituted for the whole class. Students in the LIC pilot have performed well on Shelf Exams and the usual “J curve” of early student frustration has not materialized.Discussions and conclusions/Significance: Programs like the PC-PM provide a means to train the physician workforce needed to embrace the Triple Aim and has the potential to influence medical education and healthcare delivery across the US.Reflection: Programs like the PC-PM provide a means to train the physician workforce needed to embrace the Triple Aim and has the potential to influence medical education and healthcare delivery across the US.References: 1.Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. Health Aff (Millwood). 2008 May-Jun;27(3):759-69. 2.Berwick DM, Finkelstein JA. Preparing medical students for the continual improvement of health and health care: Abraham Flexner and the new “public interest”. Acad. Med. 2010;85(9):S56-S65. 3.Irby DM, Cooke M, O'Brien BC. Calls for reform of medical education by the Carnegie Foundation for the Advancement of Teaching: 1910 and 2010. Acad. Med. 2010;85(2):220-227.

Poster F-54: Course/Faculty Assessment

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Learning Objectives: By the end of the session, participants will be able to: Develop a Course/Faculty Assessment protocol for a specific learning environment Create a culture of collaboration, transparency, and responsiveness Provide orientation for both students and faculty Generate follow-up to student commentsMethods/Approach: Background: Those colleges and universities, which are considered effective institutions of higher learning, successfully respond to many forces.1 Institutional and governmental standards, parental concerns, student success and satisfaction, and accreditation requirements are significant factors nationwide. In the face of such scrutiny, the Course/Faculty Assessment Program has successfully changed the way we think about the assessment of courses and faculty members at SUNY Downstate, College of Medicine. It has changed the way we gather data, and what we do with it. It has changed our students, faculty, and administrators. Continuous Quality Improvement (CQI) the work of W. Edwards Deming, more likely seen in the business sector, is the basis for the innovative Course/Faculty Assessment process.2 Using the principles of CQI, the Mayo Medical School, developed a course evaluation process, which SUNY Downstate modified to meet the needs of our large student body, our specific curricular design, and the pedagogical practices of our school.3 Course/Faculty Assessment: How it works The CFA is a student team assessment program which evaluates both courses and associated faculty instructors. SUNY Downstate welcomes approximately 200 new students each year. The class of approximately 200 is divided into 8 groups, by random assignment4. One group will assess just one of the Units that students take within their first two academic years. There are approximately 23-25 students in the resulting groups. These students form a CFA team. Once students are contacted, an orientation meeting is scheduled during which students are informed about the CFA process and procedures. Most importantly, students are trained in delivering professional feedback. Many examples are offered as to how to generate constructive comments and students are reminded that their comments will be public. Students are asked to take ethnographic notes, recording anything noteworthy as they attend all classroom sessions, and labs. This process sets the CFA program apart from the more conventional assessments in that students write down their concerns in situ, as they go through their day. Group members meet at regularly scheduled times and locations, to discuss their findings throughout the course. After the course concludes each group develop a brief report. Students are asked to include both compliments and criticism and to develop consensus opinions. Further, the group is responsible for making actionable recommendations to improve any situation about which a

criticism is made. Although we offer some suggestions regarding topics to consider, we make it abundantly clear that all matters are open to discussion. Two key features of key features of the Course Faculty Assessment program are transparency and accountability5. CFA Reports are posted on the SUNY Downstate community web. In addition, the school has obligated itself to respond to any and all comments made by the CFA group. The school's responses, categorized as noted below, are also posted. Action Taken- Recommendation has been acted upon Already in place – NYIT COM already addresses this, but students were unaware of the policy, procedures and/or resources Research – Recommendation being discussed, additional information required No Action Taken– Recommendation held aside, no change will be made-rational provided. The Course/Faculty Assessment Program has created a culture of assessment within pre-clinical education. Students have done a tremendous job of authoring professional, evenhanded feedback for both course and faculty issues. Faculty and administrators are more than simply receptive to student views, they eagerly await their comments. References: References 1Middaugh, M.F. Planning and Assessment in Higher Education. California: Wiley Press, 2010. 2Deming, E. Out of the Crisis. Boston: MIT Press, 2000. 3Viggiano,T. & El-Sawi,N. Applying Principles of Continuous Quality Improvement in the Course Evaluation Process. In IAMSE 2008 Webinar Series. Retrieved from http://www.iamse.org/development/2008/was_111208.pdf 4Kreitter, C.D. & Lakshman, V. Investigating the use of sampling for maximizing the efficiency of student-generated faculty teaching evaluations. J Med Educ 2005; 39: 171-175. 5Stone, S.L. & Qualters, D.M. Course-based Assessment: Implementing Outcome Assessment in Medical Education. Acad Med 1998;4;397-401.

Poster S-1: INTENSE AND FOCUSED EDUCATION PROJECT FOR INTERNAL MEDICINE (IM) RESIDENTS AT LAHEY HOSPITAL AND MEDICAL CENTER (LHMC): A VALUABLE STRATEGY TOWARDS IN-TRAINING AND ABIM CERTIFYING EXAM SUCCESS

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Purpose/Problem Statement: PROBLEM STATEMENT: The performance of our IM Residents on the IM-In-Training Exam (IM-ITE) and the American Board of Internal Medicine-Certifying Exam (ABIM-CE) was noted to have declined in 2010 (all-time low 50%). At that time the need to improve performance was identified and therefore an intense and focused education project was undertaken.Methods/Approach: APPROACH: Residency curriculum was reviewed by the program director and core residency faculty. Our first step was to identify areas where education could be intensified. As in other residency programs IM Board Review sessions were conducted by Chief Residents sporadically. First initiative was to provide a weekly high-yield IM Board review course. We believe that learning medicine has to be a continuous process with structured didactic and review sessions throughout residency that augment and support inpatient rounds. Since our residents rotate through many sub-specialty blocks, our second initiative was to bring a focused subspecialty education linked to clinical exposure. Key strategies implemented included: Weekly Board Review Sessions were begun 2011. These sessions were assigned to one faculty member for both development and execution. Additional strengths included: Board style questions were obtained from various question banks. Topics appearing on the IM-ITE exams were thoroughly reviewed through these questions Based on the class or program performance on the IM-ITE, certain questions were specifically developed by this faculty member to review topics that needed more emphasis. These questions were circulated for accuracy through sub-specialty faculty. Specialty-specific faculty were present to provide immediate feedback Educational hand-outs were provided and presentations were downloaded online through Docphin, (subscription available to all residents). Mock Board

Exams: We conducted exams to reinforce materials learned. Exams were formatted and evaluated by the assigned faculty. Individual feedback was provided. Each exam was teamed with a high-yield review of the questions. Continuing education during Sub-Specialty Ambulatory Rotations was instituted in 2013. We began this initiative to target specialty specific topics to obtain an understanding of the needs of each resident and to provide a platform to improve knowledge. This was supported by an internal education grant. It was conducted through: A Pre-Test and a Post-Test format. These tests were a mix of basic knowledge assessment and board style questions. After each test, residents met with respective faculty to discuss and obtain immediate feedback. The setting offered an opportunity for early intervention/remediation when needed. Residents typically receive a take-home exam with relevant clinical scenarios. These questions were developed to apply an evidence-based approach towards solving them. They were reviewed by faculty at the end of the rotation. Residents were provided the Washington Manual of Medical Therapeutics. Feedback from residents and faculty were ascertained for continued improvement. Medical Resident Library: We updated the resident library with current versions of leading text books.Results/Lessons learned: LESSONS LEARNED: Our ABIM-CE Pass Rate has steadily increased from a low of 50% in 2010 to a rolling average of 89% in 2014. IM-ITE aggregate percentile scores have increased since 2013. 2013: 16th 2014: 24th 2015: 28th Data collected on the Sub-Specialty Education Initiative over the past 2 years. Total Tests: 114 [PGY-1 (27); PGY-2 (21); PGY-3 (66)] Paired T-tests assessed Pre versus Post Test across sub-specialties: Post-test performance was statistically significantly improved irrespective of year of training: p-val=0.01282 Unpaired T-tests evaluated performance on Pre and Post Tests among PGY levels: Pre-test: A statistically significant difference was noted between PGY-1 compared to PGY-2 and PGY-3 [p-val=0.0429 and 0.00049] respectively. Post-test: No statistically significant difference between groups.Discussions and conclusions/Significance: SIGNIFICANCE: An early focused approach to identify and address gaps in knowledge can improve performance on standardized tests. Results of our analysis demonstrate that ambulatory rotations can serve as a valuable platform for improving and supporting the knowledge base of residents. Limitations include need for commitment and motivation from both residents and faculty since this depends on one-on-one feedback and coaching. We believe that a multi-disciplinary approach with faculty from all specialties is a key component to the overall success of our residents.Reflection: We believe that a multi-disciplinary approach with faculty from all specialties is a key component to the overall success of our residents.References: 1) Rollins LK et al: Predicting pass rates on the American Board of Internal Medicine certifying programs. J Gen Intern Med: 1998; 13: 414-416 2) Babbott SF et al: Predictive validity of the Internal Medicine In-training examination: Am J Med: 2007; 120(8): 735-740 3) Mathis BR et al: A multiple choice testing program coupled with a year-long elective experience is associated with an improved performance on the Internal Medicine In-Training Examination. J Gen Intern Med: 2011; 26(11): 1253-1257

Poster S-2: A simulation-based cataract surgery course for ophthalmology residents

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Purpose/Problem Statement: Over the past decade, ophthalmic graduate medical education programs have moved toward the integration of virtual simulation into surgical education. However, there is a paucity of published virtual reality (VR) curricula.1,2 We describe herein an updated simulation-based cataract surgery course, which was developed to assist

ophthalmology residents with their transition to the operating room (OR).Methods/Approach: The course is divided into two main components: (1) a didactic portion based on the America Academy of Ophthalmology (AAO) Basic and Clinical Science Course® (BCSC), “Lens and Cataract” and (2) a VR section designed for use alongside the EyeSi® ophthalmosurgical simulator (VRMagic, Mannheim, Germany). The latter section is organized by the three post-graduate years required for ophthalmology residency training; the modules for each year must be successfully completed before residents can advance to the next level. This revised simulation-based cataract surgery course reflects the most recent edition of the BCSC in the didactics section and incorporates new modules added to the EyeSi® program for cataract surgery.Results/Lessons learned: The didactic section provides a foundation in ocular anatomy and the physiology and pathology of the lens; it also serves as a reference for the simulation portion of the course. The subsections include: Lens Anatomy, Lens Pathophysiology, Preoperative Care, Procedure, Postoperative Care, and Complications of Cataract Surgery. The simulation component focuses on developing basic microsurgical skills and integrating them into performance of cataract surgery steps. Basic skills include intraocular navigation, anti-tremor handling of targeted instrument motions, bimanual coordination, forceps maneuvering, and phacoemulsification machine calibration. These are translated into advanced tasks that focus on capsulorhexis, hydrodissection, nuclear rotation, irrigation, aspiration, emulsification, nuclear disassembly, IOL insertion, white cataracts, and capsular plaques.Discussions and conclusions/Significance: This course provides a working blueprint for simulation-based resident training in cataract surgery. The course will need to be validated to determine its role in a standardized surgical curriculum3 that includes training in classroom, wet lab, and VR settings and, ultimately, the effects of simulation-based training on resident OR performance.Reflection: N/AReferences: 1. Thomsen ASS, Subhi Y, Kiilgaard JF, la Cour M, Konge L. Update on simulation-based surgical training and assessment in ophthalmology. Ophthalmology 2015;122:1111-30. 2. Li E, Fay P, Greenberg PB. A virtual cataract surgery course for ophthalmologists-in-training. R I Med J 2013;96:18-9. 3. Henderson BA, Grimes KJ, Fintelmann RE, Oetting TA. Stepwise approach to establishing an ophthalmology wet laboratory. J Cataract Refract Surg 2009;35:1121-8.

Poster S-3: Interprofessional Geriatric Educational Training Initiative - I Get It

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Purpose/Problem Statement: Interprofessional collaboration, the efforts of different professions working together to positively impact healthcare,1 has been shown to improve healthcare processes and outcomes.2 There is evidence that the most common antecedent to interprofessional collaboration is interprofessional education (IPE), defined as “occasions when members (or students) of 2 or more professions learn with, from and about one another to improve collaboration in the quality of care.”1 Moreover, IPE itself has been linked to improved teamwork and enhanced quality of care.1 IPE can be of particular importance in efforts aimed at improving pain management in older adults. The Institute of Medicine report Relieving Pain in America states that a cultural transformation is necessary to address the challenge of managing chronic pain in the United States, and proposes a strategy including improved pain-related education for health care providers. Interest in the role of non-pharmacologic approaches for managing pain in older adults is increasing.3 Reasons for this interest include patient and physician concerns about the potential for drug related adverse events and physician concerns about drug-drug interactions in the setting of polypharmacy.Methods/Approach: This paper presents a report of an interprofessional educational initiative conducted by the VA Connecticut Healthcare System and the Yale Geriatric Medicine Fellowship Program. This program is a two

week rotation for geriatric medicine fellows working with interprofessional team members in low vision, audiology, physiatry, neurology, physical therapy, occupational therapy, home care services and chiropractic care. This is aimed at improving the fellows' ability to develop multimodal treatment plans and collaborate with interdisciplinary teams.Results/Lessons learned: We have developed a unique curriculum, and have begun implementing these interprofessional educational activities. Preliminary feedback shows that we have developed a sustainable schedule of these interprofessional activities in geriatric medicine training.Discussions and conclusions/Significance: This paper focuses on the rotations in the chiropractic clinic, with a focus on non-pharmacologic approaches to pain management for older adults. Prior to the rotation, fellows complete a pre-survey assessing their confidence in addressing non-pharmacologic pain management in older adults. They then participate in two half-day sessions in the chiropractic clinic under the supervision of attending chiropractors. During this session they are mentored in physical examination, diagnosis and management of non-operative musculoskeletal pain conditions in older adults. They are exposed to treatment options including manual therapy, spinal manipulation, acupuncture, self-care, and home exercise. After completion of the rotation the fellows complete a post-survey and a commitment to change assessment instrument.Reflection: Fellows provide qualitative feedback to the geriatric fellowship associate program director on content learned and how they plan to implement this into their clinical practice. Changes in practice behavior must be measured through future formative and summative assessments.References: 1. Hammick M, Freeth DI, Koppel I, Reeves S., Barr H. A Best Evidence Systematic Review of Interprofessional Education: BEME, guide #9. Medical Teacher 2007;29:735-751. 2. Zwarenstein M, Goldman J, Reeves S. Interprofessional collaboration: effects of practice-based interventions on professional practice and healthcare outcomes. Cochrane Database Syst Rev 3.CD000072 (2009). 3. Park J, Hughes AK. Nonpharmacological approaches to the management of chronic pain in community-dwelling older adults: a review of empirical evidence. J Am Geriatr Soc. 2012;60(3):555-568.

Poster S-4: Concept mapping improves medicine residents' performance in simulated case based scenarios.

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Purpose/Problem Statement: N/AMethods/Approach: Problem: Traditional bedside teaching does not consistently achieve effective learning for the management of high stakes critical care events. New or combination educational approaches are needed to improve acquisition of such complex decision making under high stress environment for critically ill patients. Concept mapping has been shown to lead to improved critical thinking1 and clinical knowledge retention2 in undergraduate medical education, however little is known about its role in critical care graduate medical education (GME).Results/Lessons learned: Approach: We introduced a concept map workshop into our critical care simulation curriculum. 91 internal medicine residents who, in groups of 15-20, participate in two-hour teaching modules. Each module consists of, in order, an introductory lesson, a group of skills sessions and two simulated scored for performance. Two modules, Acute Respiratory Failure (three group sessions with available data) and Shock (five group sessions with data) were evaluated as a part of this study. Prior to the simulation cases, each group was divided into two arms. One arm received a concept map workshop between the skills stations and the scored simulation cases; the second arm proceeded straight from skills sessions to the simulation cases. Performance of both groups on case simulations were assessed with a standard assessment scoresheet. Scores were compared and analyzed.Discussions and conclusions/Significance: Lessons learned: Internal

medicine residents who had concept mapping sessions preceding simulation cases performed better during the case based simulation scenarios with respect to aggregate performance score ($p<0.001$),ability to reach correct diagnosis (88% versus 46%, $p=0.005$), and in time to diagnosis under 5 minutes (81% versus 13%, $p<0.001$). Free form post simulation module residents' survey comments included requests for concept map workshops to be held for both groups and during the future modules.Reflection: Significance: Effective teaching of care of acutely ill patients in highly stressful environments is known to be ineffective through traditional means of teaching, and is often pursued through simulation training in GME. We show that integration of concept mapping into usual simulation based training leads to improved performance on such cases. We suggest that the integration of concept mapping on a regular basis can improve effectivity of simulation based critical care education at the GME level.References: 1. Bixler GM, Brown A, Way D, Ledford C, Mahan JD. Collaborative Concept Mapping and Critical Thinking in Fourth-Year Medical Students. Clinical pediatrics 2015;54:833-9. 2. Saeidifard F, Heidari K, Foroughi M, Soltani A. Concept mapping as a method to teach an evidence-based educated medical topic: a comparative study in medical students. Journal of diabetes and metabolic disorders 2014;13:86.

Poster S-5: Peer Mentorship in a Neurology Residency Program

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Purpose/Problem Statement: To determine the effectiveness and utility of a Peer Mentorship program to help ease the transition into an adult Neurology Residency Program.Methods/Approach: Junior residents (PGY-2) were paired with a senior resident (PGY-3 or PGY-4) upon starting the residency program. Participation was voluntary and residents were paired based on personal and academic interests. The mentoring program was evaluated using structured questionnaires for both mentors and mentees.Results/Lessons learned: All 8 PGY-2 residents agreed to participate, and they were matched with 7 senior residents. The evaluation survey was completed by 6/7(87.5%) mentors and 8/8 (100%) mentees. Topics most often discussed included "career development" and "work life balance". 100% of junior residents agreed that they found the program useful, that peer mentoring improved the resident experience in this program, and that they would recommend peer mentorship to residents in other programs. Specifically, mentees felt that the mentoring process enhanced their ability to deal with new situations and access learning opportunities. 100% of mentors responded that they would enroll to be a mentor again.Discussions and conclusions/Significance: This pilot program represents a novel approach to incorporating peer mentoring into a neurology residency program. Based on our results there is a high demand for peer mentoring among our residents and peer mentoring enhanced the overall residency experience for trainees. Next steps will be to conduct focus groups in order to develop more detailed "best practices" for peer mentorship in residency.Reflection: Historically, mentoring has played an important role for personal and professional development within the medical field. The advantage of peer mentoring is that the mentoring relationship lies between individuals who are of similar age, training and experience. We sought to pilot a Peer Mentoring Program in the Neurology Residency Program at Yale New Haven Hospital.References: Eisen, S., et al. (2014). Peer mentoring: evaluation of a novel programme in paediatrics." Arch Dis Child 99(2): 142-146. Fleming, G. M., et al. (2015). "A facilitated peer mentoring program for junior faculty to promote professional development and peer networking." Acad Med 90(6): 819-826. Mayer, A. P., et al. (2014). "Long-term follow-up of a facilitated peer mentoring program." Med Teach 36(3): 260-266.

Poster S-6: Innovation of a Collaborative Program to Improve Patient Satisfaction: Implementing a Communication Training Program for Residents and Physicians in a New IM-GME Teaching Program at a Community Hospital.

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Purpose/Problem Statement: Measures of how a patient perceives communication from physicians and nurses is captured by the mandated quarterly reporting of Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) to CMS. In addition, Press Ganey (PG) Questionnaires are optional for purchase. A five star rating system developed by CMS is based upon 11 publically reported domains and a 12th overall measure. Our Hospital receive 5/5 stars for all domains, except in communication (3 stars). We evaluate three of the HCAHPS Composite Measures,1,2,5 that related to communication (Table 1) and initiate innovative solutions to learn, share and improve our communication performance.Methods/Approach: A collaborative, interdisciplinary team united to improve the skills of communication (Table 2). Domains of communication from our two surveys were analyzed. A resident questionnaire (RQ) of 10 items was designed to capture each PGY-1's perceived importance of questions in HCAHPS (Q 5-7) and new medications (Q16,17) and PG (Q. Section H – 1 to 5) survey (Table 3). PGY-1s completed the "pre"- survey RQ. The same questionnaire was completed after the ninth month of training (post-survey). A variety of pedagogical techniques to improve the resident's communication skills were used: 1. Biweekly didactics on QI and Safety incorporate importance of communication; 2. Caregiver Support Projects; 3. Journal Club; 4. observational learning by modelling and 5. Completion of Collaborative Institutional Training Initiative (CITI) online. CITI emphasizes informed consent (IC) as a process of communication.Results/Lessons learned: The HCAHPS survey (posted Q4 2014) covers 3rd Qtr. 2013 to 2nd Qtr. 2014 reported communication to be 3 of 5 stars. All other domains were 5. The PG communication domain was similar. Our RQ found increased scores of most residents for at least one of the ten questions over nine months. Some residents responded with increased scores for all 10 questions. No resident responded with a lower score. For those who reported no change, all had rated each question highly on the "pre" survey and none reported lower scores on the "post" nine month survey (Table 4). Detailed individual Raw Data as Forest Plots, with analysis of means and SD with CI of the group for each question is shown and broken down into the surrogate RQ questions derived from the HCAHPS and PG (graph 1); and linear regression for pre- vs post- survey results shown (graph 2)*. Our hospital's HCAPHS and PG results imply need to improve perception of physician and nursing communication with patients. How to achieve modifiable behavior and document success is learner dependent and ranges from didactic sessions, readings, role-playing, video watching and modelling, to identifying what components in the QI and Safety lectures relate to communication. We anticipate that sharing government mandated survey methods and results with physicians and nurses will be helpful to all hospital institutions in identifying domains for improving the patient experience. Creating awareness as to how patient's perceptions are measured and used to compare individual institutions is the very first step in motivating individual physician and nurses to engage in identifying a problem and seeking solutions for improvement.Discussions and conclusions/Significance: n/aReflection: Rather than focusing on imperfections in the survey

techniques (Table 5), innovative efforts towards improving the patient's experience, such as communication, should enhance the achievement of patient centered goals (Table 6). Future plans to engage affiliated practitioners, faculty and non-faculty, into this process of perception and improvement. Enhancing mutual understanding between health care team professionals (Table 7) and patients will be tracked by increased HCAHPS and PG patient satisfaction in communication and innovations evaluated for their effectiveness vs cost of implementation.References: 1. Price, R. A., Elliott, M. N., Zaslavsky, A. M., Hays, R. D., Lehrman, W. G., Rybowski, L., Edgman-Levitan, S., & Cleary, P. D. (2014). Examining the role of patient experience surveys in measuring health care quality. Medical Care Research and Review, 71, 522-554. 2. Price, R. A. Elliott, M.N., Cleary, P.D., Zaslavsky, A. M., & Hays, R. D. (2015). Should health care providers be accountable for patients' care experiences? Journal of General Internal Medicine, 30, 253-256. 3. HCAHPS Summary Star Ratings. www.hcahpsonline.org. Centers for Medicare & Medicaid Services, Baltimore, MD. Originally posted October 8, 2015, Accessed 11-26-2015 *The October 2015 HCAHPS covers the entire year of 2014 and will be analyzed for the NEGEA 4-2016 meeting Total word count (minus section in Reflections and comments prior to discussion) is 590 and characters including spaces 3888.

Poster S-7: Creating a milestone based remediation toolkit

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Purpose/Problem Statement: The successful remediation of a struggling learner requires forethought and multiple resources. It is a time consuming process. As noted by Hauer et al. in Acad Med 2009[1], very few studies exist which provide suggestions for remediation activities in medical education. This leads educators with little guidance, yet programs Programs must identify the issues that require intervention and develop a and plans to promote success. The ACGME milestones project was designed The ultimate purpose is to ensure that to demonstrate our accountability as medical educators are accountable to the public by graduating trainees who, that our graduates will "provide high quality, safe care to our patients and maintain the standards of the health care system". [2] The Internal Medicine reporting milestones describe 22 competency based developmental outcomes of knowledge, skills, attitudes and performance for trainee assessment. The biannual assessment of trainees on their trajectory to independent practice affords the opportunity for timely identification of inadequate performance and to begin a remediation program. The reporting milestones are far more specific than the 6 competencies of the past for describing the behaviors that a trainee must master to become independent. Because of this granularity, a Program Director, Clinical Competence Committee or an advisor can more easily identify the issue that needs attention and then create a remediation plan that addresses the specific problem. Various activities may be employed to address remediation issues. All activities should have a means of evaluating resident completion and success. Some activities may be applicable to many learners but some learners may need activities crafted specifically for their individual needs. Creation and recreation of activities is a time consuming process which requires significant manpower. The creation of a toolbox would simplify this process. The reporting milestones facilitate an opportunity to develop a toolbox for remediation that can be utilized by the residency program and also provide general principles that can be shared with others. With theis new lens afforded by the milestones, one can more readily see it is easier to characterize where a trainee's difficulty lies. The next obvious step is to implement identifity the specific activitiesy to promote improvement and success in that area of weakness. The specificity and transparency of the 22 reporting milestones allows for creation of specific observable activities to target a learner's remediation needs and put them back on the trajectory

to independent practice. We have performed an inventory of previously created activities and mapped them to reporting milestones. In addition, we are in the process of creating new remediation activities for milestones not previously addressed. The compilation of these form the basis of our toolbox. This growing toolbox contains mapped specific, observable activities with evaluation tools to address an individual learner's needs without "reinventing the wheel" for each learner. It defines the activity, the timeline, the activity evaluator, the definition of success and how success will be measured. It also contains available institutional and community resources to address secondary issues that might be a barrier to success.Methods/Approach: As chairperson and faculty on their program's Clinical Competence Committee we have been engaged in the arduous process that occurs each time a resident is identified as needing remediation. Once the issue has been identified, discussion ensues as to how to remediate the problem. With issues of medical knowledge, previously utilized activities can be re-implemented. Other issues have less simple solutions. Often activities need to be constructed to meet the learner's needs. Sometimes institutional memory may recall activities that have worked in the past. More commonly, new activities and evaluation tools need to be developed with a plan devised for execution. For the benefit of the learner and the efficiency of the process, we realized a better practice was needed. The granularity of the 22 reporting milestones made the development of a remediation toolkit a viable project. We began by performing an inventory of previously used activities and asked for input from those who had participated in the activities as both a teacher and learner. We then searched the literature for activities which would enable remediation of individual reporting milestones. Next we embarked on creating activities to address learner needs for issues for which remediation activities were lacking. For example, in the internal medicine milestones, patient care 3 (PC3) requires the trainee to manage patients with progressive responsibility and independence. A trainee in our program was having difficulty transitioning between the level of an intern and resident. To aid this growth, we designed a resident coach role. The chosen coach was a senior resident with known teaching skills and exemplary professionalism. The coach observed the learner in need throughout the day while on rounds, while making triage decisions, and while instructing other learners. The coach then provided guidance and in the moment feedback. The coach also worked with the attending to build skills and provide feedback based on preset goals. Subsequently, both the learner and coach were debriefed on the strengths and weaknesses of the activity and suggestions were made to employ coaching for other learners who may require it in the future. In addition to activities targeting the reporting milestones, program leadership was queried about resources in the community which would enable evaluation of secondary issues that might be impairing performance. By compiling these resources, individual advisors would have a repository of referrals. This project is an ongoing process with the end goal of providing a foundation for initiation of a remediation program for the entirety of potential learner struggles.Results/Lessons learned: There are very few validated interventions for remediation in the literature. Of those that exist for internal medicine, the focus is generally on medical knowledge. Studies suggest this is the easiest competency to remediate.[1] There are limited other published activities to remediate other competencies. This necessitates the creation of new untested tools. Although learners report improvement in their skills by participating in the activities we have implemented, we have no validation of the activity or concrete measurement of success. We hope to perform future qualitative assessment of the interventions but given the small number of interventions performed annually, the information gleaned will be limited. There are very few validated interventions for remediation in the literature. Of those that exist for internal medicine, the focus is generally on medical knowledge. Studies suggest this is the easiest competency to remediate.[1] There are limited other published activities to remediate other competencies. This necessitates the creation of new untested tools. Although learners report improvement in their skills by participating in the activities we have implemented, we have no validation of the activity or concrete measurement of success. We hope to perform future qualitative assessment of the

interventions but given the small number of interventions performed annually, the information gleaned will be limited.Discussions and conclusions/Significance: The ACGME initiative for programs to evaluate trainees on the road to competence has created a new opportunity for remediation. Specific activities designed to improve the knowledge, skills, attitudes and performance necessary to achieve independent practice have the capacity to improve the overall remediation process. By creating a repository of remediation activities, each with its own evaluation tool, allows for timely intervention and specific feedback for the learner. We hope this will in turn enhance the likelihood of learner success. We hope the creation of this tool kit offers opportunity to collaborate with others, share remediation activities and grow the repository. Remediation issues span programs of all types and disciplines. Review of ACGME millstones for a variety of GME programs demonstrates significant overlap. Although some of our activities are specific to the resources at our program, they could be tailored by others. We in turn would welcome new ideas to help our trainees.Reflection: Participating in the remediation of the struggling learner is a privilege. To play a part in helping a learner overcome difficulties and succeed in their training is a great reward for a medical educator. By creating a streamlined mechanism that addresses specific issues, engages direct observation, and provides evaluation tools, targeted interventions can occur as soon as problems are identified. Early directed interventions can lead the struggling learner to a trajectory towards independence.References: [1] Hauer KE, Ciccone A, Henzel T, Katsufrakis P, Miller SH, Norcorss W, Papadakis, MA, Irby D, Remediation of the Deficiencies of Physicians across the continuum from Medical School to Practicie: A Thematic Review of the Literature. Acad Med. 2009;84:1822-1832 [2] ACGME Website [3] Dupres DM, Edson RS, Halvorson AJ, Hopkins RH, McDonald FS, Problem Residents: Prevalence, Problems abd Remediation in the Era of Core Competencies, APM Perspectives; American Journal of Med, 2012, 4: 421-425

Poster S-8: Columbia University Medical Center's Writers in Residency: The Doctor as Reporter.

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Purpose/Problem Statement: We propose a writing course for residents aimed to enhance communication between physicians and the public and to improve the quality of medical information available in a mainstream media frought with misinformation. The sources of this incorrect content include non-professionals who distrust science, headline-grabbing doctors, and advocates and lobbyists working on behalf of industries such as pharmaceuticals and insurance. Even the medical community itself is not immune to faulty data. To wit, at least 33 percent of press releases touting peer-reviewed studies contain exaggerations, translating to exaggerations in news stories 86 percent of the time.1 Our course, Writers in Residency [WIR], provides resident doctors with the tools to communicate with a wide audience and aims to improve health literacy and drown out the pseudo-science that clogs national dialogue.Methods/Approach: Writers in Residency teaches doctors to think and write like journalists. The curriculum consists of three core classes designed to be practical, concise and efficient in order to conform to residents' busy schedules. Because participants are used to writing patient notes for their medical peers, the first class covers writing foundations, including avoiding passive voice, news story construction and making time to write. Session two addresses moral and legal dilemmas faced by doctors who publish. The final class instructs in peer-editing using a checklist, discusses social media and the accelerated news cycle, and provides guidelines on pitching stories. In the course's inaugural year, a senior editor from Men's Health magazine provided feedback on ideas and offered his outlet for pitching.

Throughout the three class cycle, participants are guided through a series of assignments culminating in a piece of writing; the instructor then meets with residents individually to discuss and edit pieces, and plan next steps toward publishing. The first year acted as a pilot program; following the second cycle of sessions, participants will complete evaluations through a combination of interviews and questionnaires aimed at improving curriculum structure, scheduling and program infrastructure to help participants in continuing their writing after completing the three-class cycle.Results/Lessons learned: The first iteration of the program yielded insights into the experience of new doctors, namely that, so early in their medical training, they often maintain the perspective of a “civilian” who has access and authority in the complex world of medicine. For instance, several participants chose write about the code conversation;" their discomfort surrounding this aspect of practice and desire to understand it better through writing is emblematic of the fact that new doctors are an ideal bridge for the general public and the oft-shrouded medical community. The program is adding infrastructure to help doctor-writers complete articles in the midst of a 80-hour work week.Discussions and conclusions/Significance: Although a few writing courses for residents do exist, most notably the extremely successful Yale Internal Medicine Residency Writer’s Workshop, the Columbia course is distinct in its focus on writing as a means of communication and education. As Yale’s workshop shows, writing is a tool of self-reflection, providing residents with insights about themselves and their patients.2 Beyond this, Writers in Residency aims to create a direct and public dialogue between patients and providers. Writing allows physicians to communicate with a population beyond an individual patient panel and with greater depth than clinic schedules and ward duties permit. In fact, medical writing by doctors for the public can change health behaviors and health outcomes.3 The course, with its structured curriculum that teaches writing from the ground up, lends itself to wide adoption by residency training programs. The three sessions, each an hour and a half long, fits into even the busiest of resident schedules. The program will provide a cohort of physicians with the tools to continually engage in this most vital form of education and communication.Reflection: Medicine is happening faster. While new discoveries continue to be reported in journals, they are also being published in advance online in the name of transparency and timeliness. Patients admitted to the hospital are armed with information, both good and bad. And the ability to share results makes collaboration among doctors -- sometimes at the behest of patients or families -- easier. In light of this, doctors have two choices: become more insular at the expense of what is happening outside the hospital, or engage with the world and start to shape the flow of information. We propose that the latter is more effective and even more humane. WIR teaches doctors the conduits through which the world gets its information, its lingua franca and helps them enter those conversations. When providers and people in need both have the most advanced and accurate information in hand, level of care improves.References: 1. Selvaraj S, Borkar DS, Prasad V. Media coverage of medical journals: do the best articles make the news? PLoS One 2014; 9(1). 2. Reisman AB, Hansen H, Rastegar A. The craft of writing: a physician-writer’s workshop for resident physicians. J Gen Intern Med 2006; 21:1109-1111. 3. Liao JM and Secemsky BJ. The value of narrative medical writing in internal medicine residency. J Gen Intern Med 2015; 30(11): 1707-10.

Poster S-9: The Efficacy of Residents as Teachers in an Ophthalmology Module

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Purpose/Problem Statement: Residents-as-teachers programs have their roots in the 1960s and have subsequently spread to many sub-specialties1. Residents have reported spending

upwards of 25 percent of their time teaching fellow residents and medical students2. Until relatively recently, there have not been formal requirements in residency programs to learn teaching skills. Residents-as-teachers programs have been shown to improve residents teaching skills, their attitudes toward clinical teaching, and improve clinical knowledge and clinical skills3. The first goal of this study is to develop a novel residents-as-teachers training program to educate Ophthalmology residents on facilitating group learning and emphasizing critical thinking skills. The second goal is to educate residents on how to teach clinical reasoning skills. Our hypothesis is that with training, residents can be effective in teaching basic ophthalmic principles.Methods/Approach: We implemented a mixed-method design using both a focus group strategy and a Likert-style survey to collect data. We designed a longitudinal residents-as-teachers program in the Department of Ophthalmology at Yale School of Medicine for our four senior Ophthalmology residents. The program consisted of a 2-hour workshop before teaching, voluntary observation of their teaching in the small group, and student feedback on their teaching. The focus of the workshop was to educate the residents on how to facilitate critical thinking and clinical reasoning in a small group format. A total of four residents and six faculty members participated as teachers for three small group seminars with 92 medical students divided into ten groups. At the conclusion of the last seminar, medical students were asked to complete an 8-question survey consisting of 4 knowledge-based content questions and 4 Likert-style questions addressing students' evaluation of seminar content, their level of comfort speaking up in class, and their comfort describing ocular pathology. Regarding the knowledge-based content questions, we calculated the mean for the 4 questions and compared the responses for the students in the resident teachers' seminars and faculty teachers' seminars. Data from the Likert scales were analyzed with unpaired t tests using Microsoft Excel.Results/Lessons learned: Medical students' knowledge-based comprehension was found to be high in both resident-led (averaging 88% correct) and faculty-led seminars (averaging 87% correct) ($p = 0.86$). All 32 medical students in the resident-led and 55 of 60 in the faculty-led seminars responded that the seminars were either "extremely" or "pretty" helpful in understanding eye pathology, on a 4-point scale ($p = 0.10$). 29 of 32 students in the resident-led seminars and 56 of 60 in the faculty-led seminars responded as being either "extremely" or "pretty" comfortable speaking up in class ($p = 0.65$). Medical students' feedback noted that the residents were "very well prepared… to facilitate [the seminars]" and they would like to continue having residents teach medical students in this setting in the future.Discussions and conclusions/Significance: This study found that the resident teachers who completed the residents-as-teachers program were equally as effective as faculty in building medical students' comprehension of ophthalmic principles during small group seminars according to the students' evaluation of teaching performance. We also found that all of the medical students' responses were overwhelmingly positive towards having residents as teachers. This is the first study we are aware of that has measured outcomes of Ophthalmology residents as teachers. Our limitations include the brevity of our post-intervention questionnaire, which limited the amount of data we had to analyze. Also, we did not collect pre-intervention data, which further limited our ability to interpret the data. In the future, we plan to provide a pre-intervention survey and provide a more robust post-intervention survey.Reflection: n/aReferences: 1. Brown RS. Pedagogy for surgical house staff. J Med Educ. 1971;46(1):93-95. 2. LaPolio LR. Time study of students and house staff on a university medical service. J Med Educ. 1981;56(1):61-64. 3. Hill AG, Yuc TC, Barrow M, Hattie J. A systematic review of resident-as-teacher programmes. Med Educ. 2009;43(12)1129-1140.

Poster S-10: Sex and Gender Medicine in Emergency Medicine (SGEM): a Residency Elective A collaborative project by the Society of Academic Emergency Medicine (EM) 'SGEM' Interest Group

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Purpose/Problem Statement: There is increased emphasis on clinical research that acknowledges sex and gender differences and the reporting of sex and gender-specific results. Despite this, the implications and results of sex and gender research are not readily integrated into clinical practice. Many patients presenting with acute conditions are treated by EM residents who must apply knowledge of sex and gender differences in clinical practice. A novel educational program focused on 'Sex and Gender Based Medicine' (SGBM) and its application to emergency care may lead to improved patient care outcomes.Methods/Approach: A SGEM residency elective that can serve as a model for other programs. Participants will: 1. Describe the scope of sex and gender based differences in emergency care 2. Integrate current knowledge of SGBM into clinical practice 3. Identify opportunities for sex and gender based research in EM Curricula Design: This one-month elective includes self-study didactic resources, clinical care, and a scholarly project. Learning Resources: Society of Academic Emergency Medicine SGEM Interest Group 'Sex and Gender Educational Resource Toolkit': 1. TED.com lectures a)"Why Medicine Often Has Dangerous Side Effects for Women" (McGregor AJ) b)"The Single Biggest Health Threat Women Face" (Bairy Merz, N) 2. Academic Emergency Medicine Peer-Reviewed Lectures a)Gender-Specific Emergency Care Part 1 = https://vimeo.com/68387082 b)Gender-Specific Emergency Care Part 2 = https://vimeo.com/68387084 c)Gender-Specific Emergency Care Research https://vimeo.com/68387081 3. Texas Tech University Health Sciences Center CME Modules a)Emergency Medicine ""Y Does X Make a Difference" (McGregor) 4. Textbooks a)Sex and Gender in Acute Care Medicine (McGregor, Choo, Becker) b)Principles of Gender-Specific Medicine (Legatto) c)Handbook of Clinical Gender Medicine (Karger) d)Sex and Gender Aspects in Clinical Medicine (Oertelt-Prigione) Clinical Education: 1. Clinical shifts in the ED seeking cases that demonstrate sex or gender as an independent factor in presentation, risk factor assessment, diagnostic workup, treatment plan, communication style, prognosis, or perceived bias. 2. Clinical exposure in interdisciplinary settings that specialize in areas where sex and gender differences are central (e.g. cardiovascular, pain management, or transgender clinics). Scholarly Project: 1. Complete two of the following projects during the elective month: a) Topic Review: A write-up of SGEM scholarly question b) Journal Club presentation of SGEM literature c) Develop a SGEM Simulation Case d) Create a "Jeopardy-style" game e) Present a SGEM lecture f) Create a SGEM case in oral-board style presentation g) Create a SGEM patient-oriented educational instruction sheet h) "In This Case" - Submit a case description to an SGBM educational library.Results/Lessons learned: While this offers a framework for inititating and instituing an SGEM elective within an EM residency program, these resources and concepts are unfortunately not yet widespread nor routine in EM education. By offering this template and expert resources as a guide. we hope to raise awareness and undertanding of this increasingly imporant education topic amongst both residents as well as faculty.Discussions and conclusions/Significance: Sex and gender are increasingly relevant variables for providing quality, evidence-based emergency care. This SGEM elective fills a recognized gap in residency education and could serve as a model for other programs.Reflection: Sex- and gender-specific medicine is a step toward individualized medicine. Reseach continues to elaborate the importance of understanding the inherent differences of appreciating whether one's next ED patient is XX or XY. It is imperative that these evidence based discrepancies are incorporated into medical curriculum, including EM residency curriculum.References: 1. Miller, V, et al. Embedding Concepts of Sex and Gender Health Differences into Medical Curricula. J Womens Health. 2013 Mar; 22(3): 194-202. 2. Greenberg, M, et al. Future Directions in Sex- and Gender-specific Emergency Medicine. Acad Emerg Med. 2014 Dec; 21(12): 1339-1342.

Poster S-11: An Innovative Clinical Skills 'Boot Camp' for Dental Medicine Residents

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Purpose/Problem Statement: New York dental school graduates are required to complete a year of residency before licensure. In 2013, Winthrop University Hospital accepted its first class of Dental Medicine Residents (DMR) requiring a two-week rotatino in the Emergency Department (ED). They lacked basic medical knowledge and skills upon arrival to residency. In response to this issue, we designed a medical Boot Camp" which utilized simulation-based education for DMRs to participate in during orientation.Methods/Approach: A multidisciplinary collaboration curriculum with didactic and practical sessions included: A. Physical Assessment: Heart/Lung Sounds/Vital signs B. Sterility: Gowning and sterile technique C. History/Physical: Review of H&P; progress notes; presentations; practice with Standardized Patients D. Skills: IV placement, airway management, blood draw using task trainers and high fidelity simulators E. Emergency Preparedness: CPR/ACLS; simulator-based cases F. Communication and Professionalism: Who's Who in the Hospital, SBAR, patient interview skills; role playing clinical casesResults/Lessons learned: DMRs (n= 20) completed a Pre- and Post-test assessment to evaluate their knowledge and confidence in skills levels before and after the 'Boot Camp'. We measured gains in 6 confidence questions (5 point Likert Scale) and 15 knowledge questions. Pre–Post confidence levels increased on average of 2 points. Pre-Post knowledge questions of correct answers increased from 60 to 98.Discussions and conclusions/Significance: Our innovative DMR "Boot Camp" measured clinical skills and patient care management not provided in dental school curriculum. Assessments indicated improved confidence and knowledge prior to their hospital-based rotations. Based on our literature review, simulation has only been used in oral surgery residencies for surgical skills, not as an introduction of DMRs to clinical emergency management skills. Further data is required to develop our Boot Camp model.Reflection: Longitudinal assessments will verify significant difference over subsequent resident years and improving their knowledge retention and relevancy to their practice settings.References: Coffey-Zern, S, Calvi,R, Vorrasi, J, Meara, D. Incorporating Simulation Into Oral and Maxillofacial Surgery Residency Education and Training: Christiana Care's Method. J. Oral Maxiilofac Surg 73: 1244-1245. 2015. Balmer MC. A dental undergraduate course for the management of medical emergencies in dental practice. Eur J Dent Educ 12 (4): 239-46. 2008 Sopka S, Biermann H, Druener S, Skorking M, Knops A, Fitzner c, Rossaint R, Beckers S. Practical skills training influences knowledge and attitudes of dental students towards emergency medical care. Eur J Dent Ed 16 (3): 179-86. 2012 "

Poster S-12: A Best Case Scenario: Case-based Teaching Strategies

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References: Speaking of Teaching; Stanford University Newsletter; 1995 Winter 5 (2) Hudson JN, Buckley P. An evaluation of case-based teaching evidence for continuing benefits and realization of aims. Adv Physiol Ed 2004; 28: 15-22. Kim S et al. A conceptual framework for developing teaching cases: a review and synthesis of the literature across disciplines. Med Educ 2006; 40: 867-6.Session Outline (90 minutes): Outline: Case studies are real or theoretical stories invented to actively engage learners in critical thinking or collaborative problem-solving.

They serve an instructional purpose to enrich didactic teaching as either closed or open-ended cases. Unlike clinical cases, teaching case scenarios reinforce application or active appraisal of instructional practice. Good cases are: relevant to learners; concise and 'to the point'; and include challenging or even ambiguous points of view often encountered in medical education. Adding ambiguity or uncertainty reflects real-world challenges during the complexity of clinical practice. Case construction will include story elements; setting or scene; main/distinguishing or minor characters; central teaching themes; scenario or problem to be resolved using a Think-Pair-Share collaborative case writing exercise that seeks resolution or application of the central teaching theme (e.g., Professional behavior). Dialogue will include 3rd person subjective elements. Participants will avoid lengthy, overly dramatic case stories that may detract from the appropriate application of the intended central teaching theme. Workshop reflection will support acquisition of self-efficacy for application to effective teaching practices. Our preliminary instructional model in case writing among inter-professional faculty demonstrated an increased mean score (Pre-Post 5 pt. Likert scale) for more likely agreement in knowledge and self-efficacy = 2.86 to 4.13 (+ 1.27). Thus, our instructional model for case-based teaching was highly rated. Time frame lesson plan: Introduction (Pre-Post Assessments) – 10 minutes Case-based teaching constructs and story elements – 20 minutes Designs and examples (Self-reflection) – 10 minutes Active learning applications – 20 minutes Case writing Think-Pair-Share exercise (Worksheet #1) – 20 minutes Debriefing and Summary reflections – 10 minutesLearning Objectives: Learning Objectives: Review teaching cases that engage learners in multiple levels of critical thinking Identify case-based learning opportunities in clinical medical education Appraise strategies for writing and applying teaching cases Construct a sample teaching case using criteria for collaborative feedbackMethods/Approach: Background: Active learning increases when teaching cases are included in lectures or small group activities to promote problem-solving skills. This interactive workshop offers essential methods in constructing relevant stories that enrich key concepts, practice dilemmas, or controversial issues encountered in medical education. Case studies may reflect actual events or pose opportunities for collaborative decision-making in Quality Improvement or student/resident assessments. Unlike clinical cases, teaching case scenarios reinforce application or active appraisal of instructional practices. Effective cases tell a pertinent and interesting story that forces a decision or resolves a clinical education problem. Participants will review case-writing strategies that advance this collaborative, interactive learning process. Methods for constructing brief, yet compelling cases will enhance intended application of important medical education concepts (e.g., clinical performance and Milestone assessments; feedback on competencies; etc.) in didactic and other interactive learning environments.

Poster S-13: Critical Listening: Teaching Narrative Medicine and Reflective Practice to Medical Students and Residents

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References: Charon, Rita. Narrative Medicine: A Model for Empathy, Reflection, Profession and Trust. Journal of American Medical Association. 2001; 286: 1897-1902.Session Outline (90 minutes): Welcome 5 min Scholarship 10 min Our Experiences 10 min Experiential Exercise 40 min Debrief 10 min Identifying Opportunities (& Overcoming Barriers) 15 minLearning Objectives: After this workshop participants will be able to: 1) Describe the features of narrative medicine and its applications in medicine. 2) Synthesize experiences into coherent narratives by applying written reflection. 3) Examine reflections by identifying themes and opportunities for growth. 4) Demonstrate compassion, empathy, and respect for diverse social and cultural perspectives. 5) Identify opportunities to utilize narrative medicine and reflective practice as

teaching modalities. 6) Analyze student narratives about clinical experiences for lessons learned to help them practice reflection skills.Methods/Approach: Medical education currently faces challenges in the teaching and assessment of critical thinking, empathy, cultural competency, resiliency, and burnout prevention. By focusing on the ways in which we absorb, interpret and respond to stories, narrative medicine offers a competency-based model focused on physicians' relationships with their patients, colleagues, society, and themselves (Charon 2001). This workshop highlights the strengths of narrative medicine as one tool to help address the challenges outlined above through the practice of concrete skills. We will share lessons learned from our own experience teaching narrative medicine to undergraduate medical students and residents at the University of Vermont, and discuss strategies for effectively integrating narrative modalities within a larger curricular context. We will provide sample readings, prompts, citations, and suggestions for further exploration. Most importantly, participants will be immersed in the process via experiential writing and discussion exercises, as narrative work is most powerful when actively experienced rather than passively described. Please arrive prepared to write and to share your writing with your peers.

Poster S-14: Acute Presentations Workshop: Using Simulation to Teach "High Stakes" Clinical Situations in a Safe Environment

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Purpose/Problem Statement: Simulation using high fidelity human mannequins is an important, relatively new method of training in medical education. These simulators can talk by use of a microphone with a faculty behind a one way glass window, they have very realistic physical findings and vital signs -- they even blink and can become cyanotic. High fidelity simulation can uniquely create a realistic "high stakes" clinical situation for students in a safe learning environment. Mega-codes and other similar training sessions for clinical emergencies commonly replicate inpatient, operating room, or emergency room environments. However, in primary care settings patients present with widely varied types of illnesses and severity of clinical presentations, thus primary care providers (PCPs) must be competent in managing emergency situations. Additionally, the acuity of a patient's illness in the outpatient setting is not always immediately apparent, and PCPs must be able to quickly identify the "sick" patient. We identified these as learning needs for our Family Medicine clerkship. Additionally in typical mega-codes, it is clear that the stakes are low, as they are typically performed on a non-interactive mannequin, and because the mega-code follows the training sessions, learners are prepared for the situation. There is no element of surprise, as typically happens in real life, and there is also no sense of real urgency. As such, these training sessions usually do not activate learners as they would be in a real situation. On the flip side, if a learner's first experience running a code is during an actual code, this is often too anxiety-producing for them to perform or learn at the optimal level. Educational theory highlights the relationship between anxiety and learning based on the Yerkes-Dodson law. If the stakes are too low or too high, effective learning does not take place.Methods/Approach: Our family medicine clerkship students participate in a required simulation session during which they care for a simulated patient in an ambulatory setting who presents with cough and shortness of breath. During their interview and physical examination, the patient decompensates due to an acute MI and ultimately ends up needing CPR provided by the students. The simulation ends after the students revive the patient. There is a two part extensive debrief that facilitates a reflective conversation focusing on clinical reasoning, teamwork skills, and interpretation of physical exam findings and testing results (ECG and chest x-ray).Results/Lessons learned: High fidelity simulation is relatively new to medical education,

and one that is not commonly used in primary care clerkships. Using this educational method, we observed that students are able to practice activities such as CPR and patient management in a unique way that is very different from other methods previously implemented in medical education. The feedback we have received from our students is that not only do they enjoy this type of learning experience, but also they feel that this particular workshop prepares them to handle emergent situations that could arise in a primary care setting. It strikes the balance of being realistic enough to activate students' anxiety, but safe enough to keep that activation in the optimal zone for a meaningful learning experience. Students rated each of the following three domains at 4.8/5 (1= strongly disagree through 5= strongly agree): Relevance/usefulness of content; Facilitator Effectiveness; and Overall Value of Session. Typical comments included: "Acute Presentation [workshop] taught me the most important lessons." "Acute presentation [workshop] was amazing. Extremely valuable experience."Discussions and conclusions/Significance: This method of learning activates students in a way that provides both optimal learning, and an experience that they value.Reflection: We think it is important to share this session with our colleagues at other schools and discuss how they can implement similar educational experiences at their own institutions.References: Yerkes, R. M., and Dodson, J. D. (1908). The relation of strength of stimulus to rapidity of habit-formation. Journal of Comparative Neurology and Psychology, 18, 459-48

Poster S-15: Effects of the explicit, implicit, and extra curricula on graduating medical students' learning of history and physical exam

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Purpose/Problem Statement: History taking and physical examination (H&P) is featured first amongst AAMC's list of 13 Entrustable Professional Activities (EPAs).1 However, there has been widespread concern about the decline in H&P skills among medical graduates. Some of the proposed reasons for this decline lie outside of the explicit curriculum: poor role modeling, decreased bedside teaching, and an increased emphasis on electronic information and testing.2 Evidence suggests that misalignment of explicit and implicit curricula may confuse students and lead to acquisition of values other than those explicitly taught.3 This qualitative study explores the relative influence of the explicit, implicit, and extra curricula on Columbia University medical students' learning of the various activities of the H&P skills outlined in EPA1.Methods/Approach: Semistructured, hour-long interviews were conducted with ten fourth-year medical students. Participants discussed the proportion of learning within explicit, implicit, and extra curricula for H&P activities contained in EPA1. Codes were generated and interview transcripts thematically analyzed in an iterative process to understand how the three curricula influenced students' H&P education.Results/Lessons learned: Overall, students reported that the implicit curriculum during their clerkship years influenced their H&P skills the most. The preclerkship explicit curriculum was identified as second most influential. Mixed messages between and within these curricula were identified and reported to be a source of frustration. Good and bad role-modeling as well as direct patient interaction were perceived as particularly impactful parts of the implicit curriculum.Discussions and conclusions/Significance: This study underscores the importance of the implicit curriculum in students' attainment of H&P skills. Although this is a single-center study, our results explore common issues in medical education. Understanding the implicit curriculum and addressing its challenges through initiatives, such as those focused on improving role modeling, may represent effective methods to improve the overall teaching of H&P skills.Reflection: N/AReferences: 1. Association of American Medical Colleges. (2014). Core Entrustable Professional Activities for Entering Residents: Curriculum Developrs' Guide. AAMC. 2. Verghese A. (2008). Culture shock—patient as icon, icon as patient. N Engl J Med. 359(26):2748-2751 3. O'Donnell JF. (2014). The Hidden Curriculum – a Focus on Learning and Closing the Gap. In Hafferty FW, O'Donnell JF, eds. The Hidden Curriculum in Health Professions Education. Lebanon, NH: Dartmouth College Press

Poster S-16: Simulating Internship: A Novel Approach to the Fourth-Year Medical Student "Transition to Internship" Curriculum

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Purpose/Problem Statement: The transition from medical student to intern is inherently challenging and anxiety-provoking. Interns often feel underprepared for their new roles as primary providers. The ability to recognize when assistance is needed, properly call a consult, and obtain informed consent are skills prioritized by a majority of internal medicine (IM) residency program directors.1 In response to this need, some medical schools developed

transition to internship courses. Although these courses have improved self-assessed ratings of professionalism, communication skills and overall preparation in future surgical interns, limited data exist on their efficacy in IM trainees.2 Simulation is an effective method for clinical and communication skills education.3 Thus we piloted a simulated “Day in the Life of an Intern” session as part of the Perelman School of Medicine (PSOM) elective course, ‘Transition to Medicine Internship’. By simulating intensive clinical responsibility and real-time practical knowledge application, we hypothesized that this innovative approach would improve perceived comfort in medical knowledge, clinical decision making, communication and technical procedural skills for graduating medical students.Methods/Approach: The ‘Transitions’ elective was instituted in 2010 at PSOM. Following a series of revisions, the two day, 14-hour 2015 course featured a new immersive simulation component. Thirty 4th year medical students heading into preliminary or categorical IM internships participated voluntarily. Day 1 included lectures and small group activities focused on clinical and communication skills such as EKG interpretation, procedural training, calling consults, and having difficult conversations. Day 2 consisted primarily of a 4-hour simulation of a “Day in the Life of an Intern.” Students were placed into small groups of 3-4 students facilitated by IM faculty or subspecialty fellows. Activities included 40 minute simulations followed by 20 minute debriefings for each of the following: (1) admission from the emergency department, (2) rapid response of a floor patient, (3) end of life discussion, and (4) common patient care phone calls. A 46-question survey assessing comfort levels with daily intern activities was administered pre-course, immediately post-course and 2 months into the participating students’ internships.Results/Lessons learned: Thirty students (66% female) completed the course, 16 of whom completed all 3 surveys. Of the participants, 70% received Honors in their medicine sub-internship and 47% completed their last clinical rotation more than 2 months prior to the course. Seventy-five percent ‘strongly agreed’ that this course was important to medical student education with 72% preferring simulation instruction above all other methods. Immediately following course completion, 86% of students reported feeling ‘somewhat prepared’ or ‘well prepared’ for internship compared with only 50% pre-course. Regarding perceived comfort with clinical tasks such as management of unstable patients, interprofessional communication, and effective signout, course participants demonstrated improved comfort in 26 of 34 assessed domains.Discussions and conclusions/Significance: There is a need for more robust IM transition curricula and training. A simulation-based course improved students’ self-assessed preparedness for internship and comfort level with key clinical and communication skills. This study was limited by low intern survey response and the inherent subjectivity of self-assessed competency. Future studies are needed to objectively evaluate the clinical performance of course participants early in internship.Reflection: Simulation is a well-received and effective educational method for teaching clinical skills to medical students preparing to begin internship. Training curricula should focus on developing necessary skills to succeed as an intern. Future iterations of this course should minimize didactic lectures and passive learning and emphasize interactive sessions with as much simulated experiences as possible.References: 1. Angus S, Vu TR, Halvorsen AJ, et al. What skills should new internal medicine interns have in July? A national survey of internal medicine residency program directors. Academic Medicine 2014; 89(3): 432-5. 2. Minter RM, Amos KD, Bentz ML, et al. Transition to surgical residency: a multi-institutional study of perceived intern preparedness and the effect of a formal residency preparatory ourse in the fourth year of medical school Academic Medicine 2015: 90(8): 116-24. 3. McGaghie WC, Issenberg SB, Cohen ER, et al. Does Simulation-based Medical Education with Deliberate Practice Yield Better Results than Traditional Clinical Education? A Meta-Analytic Comparative Review of the Evidence. Academic Medicine 2011; 86(6): 706-711.

Poster S-17: Longitudinal Integrated Clerkship (LIC) Surgical Didactic Curriculum Development

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Purpose/Problem Statement: Literature searches fail to identify any formal surgical didactic curriculum specific for LIC students. Many LIC preceptors, particularly rural preceptors, are not formally trained academic physicians and may have little experience in the techniques of medical education. These preceptors would benefit from resources to help provide a formalized and systematic didactic educational experience. The curriculum should be tailored to the strengths of the LIC program: Small student to faculty ratio, teaching by experienced clinicians, and a nine month duration which allows time for a comprehensive didactic experience and the ability to better identify strengths and weaknesses of students.Methods/Approach: The purpose of this innovation in education project is to create a didactic curriculum for the LIC Surgical component that develops clinical reasoning skills by emphasizing key elements in evaluation of a given problem. The key elements entail: 1. Establishing the necessary fund of knowledge 2. Emphasizing the importance of a good history 3. Identifying key physical findings 4. Selecting appropriate lab and diagnostic imaging 5. Developing the differential diagnosis 6. Making the diagnosis 7. Appraising treatment options incorporating concepts of value, quality of life and patient preference The curriculum is delivered in weekly 60 minute interactive small group sessions with two third year medical students, as well as monthly larger group sessions with approximately 20 students. Adult learning theory concepts are used as well as The Socratic Method technique, beginning with “What do you do when your patient…” Each session concludes with group problem based learning exercises to consolidate the learning and promote collaborative learning and teamwork. Handouts, references, and links to on line resources are distributed.Results/Lessons learned: Content has been created for the following twelve topics: sutures, suturing techniques, fluids and electrolytes, abdominal pain, respiratory failure, sepsis, shock, renal failure, rectal pain, neck masses, burns, and preoperative medical evaluation. Sessions based on each of these topics have been delivered at least two times and in some cases four times, with uniformly favorable feedback from the students who reported looking forward to the sessions and wishing there was time for more of them.Discussions and conclusions/Significance: n/aReflection: Can be used by any surgery preceptor with access to a whiteboard and a small venue, can be modified/personalized/updated as needed. Allows for better standardization of content across multiple LIC sites. May be particularly helpful for new preceptors/new medical educators. Preceptors may need training in small group teaching and Socratic Method. Readily transferable to other programs with similar characteristics.References: Torre D, Daley B, Sebastian J, Elnicki M. Overview of Current Learning Theory for Medical Educators. Am J Med. 2006; 119(10):903-907. doi:10.1016/j.amjmed.2006.06.037

Poster S-18: Preparing Graduating 4th year Medical Students for Internship- Implementing a Transitions of Care Workshop

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Purpose/Problem Statement: To provide a framework for practical training in Transitions of Care for graduating medical students to address an educational gap and prepare students as they move on to residency and increasing patient care responsibilities.Methods/Approach: Care Transitions are complicated and ineffective transitions result in poor patient outcomes and readmissions. The Accreditation Council for Graduate Medical Education (ACGME) has made Transitions of Care one of the six focus areas within the Clinical Learning Environment Review

(CLER) program. Residency programs are formalizing curricula around this topic, however graduating medical students have no formalized training in Care Transitions. Our objective was to provide a framework for practical training for graduating medical students.Results/Lessons learned: A case based workshop on care transitions was created and delivered to graduating medical students on an Internal Medicine selective focused on preparing for internship. This included a small group didactic and a team based problem-solving session focused on a discharge case of a geriatric patient with multimorbidity. Using the patient presented in the case, the learners were asked to identify and discuss: -discharge issues including proper medication reconciliation -post discharge adverse events -high risk patient features in care transitions -consequences of ineffective transitions -safest discharge destination -stakeholders in discharge planning and enhanced strategies for communication across care sites -important components of discharge summaries Faculty who facilitated the team based problem-solving session were able to observe active learning amongst the students using the tools taught to work through the patient case.Discussions and conclusions/Significance: -Reflection: Students completed a survey assessing the effectiveness of the workshop in helping them to identify the features that result in effective care transitions as demonstrated in the session objectives listed above. All of the students stated that they agreed or strongly agreed that the workshop was effective in meeting each of the session objectives. This session adequately addressed the gap in education on Transitions of Care as demonstrated by the survey results showing effectiveness and student ability to directly apply recently acquired knowledge and skills. As such, the session equipped graduating medical students with the tools required to adequately transition complex patients. This is critical in the final phase of medical school as students move on to residency and increasing patient care responsibilities. Given the impact of this workshop, we plan to expand its delivery to a larger subset of medical students and then adapt components of this workshop to use in resident training. Plans are underway to implement this high interest topic at a neighboring medical school.References: Kim CS, Flanders SA. In the Clinic. Transitions of Care. Ann. Intern. Med. 2013;158 ITC3-1. ACGME CLER; https://www.acgme.org/acgmeweb/Portals/0/PDFs/CLER/CLER_Brochure.pdf

Poster S-19: The “X” Factor: power of observation and feedback in medical education

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Purpose/Problem Statement: We developed a mandatory rotation named Elective X", in which senior residents lead pateint-based teaching sessions for third year internal medicine clerkship students. Our objective is to enhance clinical skills of our medical students and develop the teaching skills of residents with our robust 360 feedback from attendings and students.Methods/Approach: In academic institutions, clinical teaching is an expectation for faculty, residents, and senior medical students. Nevertheless, formalized programs for developing teaching skills are often lacking. We have developed a mandatory rotation, named ‘Elective X’, in which senior residents lead patient-based teaching sessions for third year internal medicine clerkship students. These sessions are observed by faculty physicians, who provide feedback to both housestaff and students. We hypothesize that if resident physicians have protected time to develop their teaching skills and incorporate feedback from attending physicians as well as from students, that they will be more adept educators.Results/Lessons learned: Two anonymous surveys were created, one for third-year medical students and the second for PGY-3 housestaff consisting of 15 and 13 questions, respectively. Anonymous surveys were collected over a two-week period via email, created by surveymonkey.com. Of the 29 PGY-3 housestaff, we were successful in receiving all 29 surveys, while we received 76 of 100 surveys sent to third year medical students.Discussions and conclusions/Significance:

Elective X was designed to enhance the clinical skills of medical students and to develop the teaching skills of residents by robust 3600 feedback. Among the 76 students and 29 housestaff that were surveyed, all of them either strongly or very strongly felt that Elective X was a valuable learning opportunity. Greater than 90% of students felt more comfortable in collecting a history, performing a physical exam, and developing a differential diagnosis. Greater than 95% of housestaff felt more comfortable as educators and teachers of history and physical exam skills. Additionally, 22 of 29 residents surveyed stated that they were more likely to pursue a career in academic medicine, in which they were expected to educate students and colleagues after completing this rotation. Finally, the ability to give constructive feedback is a fundamental value expected from physicians, but is seldom observed or supervised. Multiple studies have shown that although educators feel they have provided feedback, this is rarely reciprocated by trainees (1). Our survey demonstrated that 90% of both medical students and house staff agreed they had received constructive feedback, in addition to having an opportunity to provide feedback.Reflection: Elective X is a novel model that addresses the gaps in the current structure of formal medical education. Our survey suggests that we have been effective in developing the clinical skills of early medical students, while simultaneously molding house staff into effective clinical educators.References: Van De Ridder, J M Monica et al. 'What Is Feedback In Clinical Education?'. Medical Education 42.2 (2008): 189-197. Web. "

Poster S-20: From the Ground Up: Thoughtfully Renovating an Obstetrics and Gynecology Clerkship Based on Student Performance and Feedback

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Purpose/Problem Statement: Problem Statement: Columbia's College of Physicians and Surgeons' Obstetrics and Gynecology department has been interested in finding ways to improve its major clinical year clerkship due to lower-than-national-average exam scores and lower student satisfaction ratings than other clerkships.Methods/Approach: Approach: Our efforts to address these issues were grounded in Bordage's practical approach to curricular development as framed by Flexner's curricular reform legacy. In keeping with that conceptual framework, we began by orienting ourselves to the problem by reviewing the external demands on the clerkship from the LCME, the USMLE, and the APGO education committee and by completing a thorough literature review on current trends in medical education with particular attention to Ob/Gyn-specific teaching strategies. We then analyzed our own wealth of evaluation data - end-of-rotation feedback, lecture-specific surveys, graduation comments, and faculty preceptor input - using the Glaser-Strauss grounded theory method. After discussing those findings, we resolved to make the changes that the data revealed as advised and necessary. --- We redid the assignment requirements for the clerkship including simplifying the case logger, offering a more-detailed observed H&P checklist, removing ineffective web-based modules, and adding a formal history and physical write-up with an emphasis on differential diagnosis and psychosocially-appropriate planning. --- We restructured mid-clerkship feedback so that students receive formal feedback from the attendings working most closely with them rather than all generically from the clerkship director. --- We reorganized the scheduling of the obstetrics portion of the clerkship to better balance university and community hospital time, to provide physician-to-student teaching in Ultrasound clinic, and to better integrate students into Antepartum rounding. --- We provided more time for the weekly preceptor sessions of the clerkship and created a Preceptor Guide" with activity suggestions. --- We added more variety to the OSCE question bank while simplifying how questions are phrased and shortening the examination overall. --- Finally, we created a unified lecture curriculum complete with 3 skills sessions and 16 standardized lectures directly tied to the USMLE medical knowledge objectives

for Ob/Gyn. They can be given by any attending or teaching resident that is available, are interactive (involving cases, games, comprehension questions, and team-based competitions), and will be given on a single didactics day every week for the five week clerkship. --- All of these changes were enumerated and clarified in a revamped and complete Student Handbook. These changes will be fully phased-in by the start of the new major clinical year class in January 2016 and will be rigorously evaluated and dynamically improved based on student surveys and interviews, Shelf and Step1 scores, and faculty and housestaff feedback.Results/Lessons learned: Lessons learned: From this project, we have learned the critical role of the information medical schools garner by requiring each student to complete anonymous evaluations at the end of each clerkship with detailed questions on strength and weaknesses as these comments provided the thrust of our reforms. We also learned the importance of the preclinical curriculum in shaping students' education during their clinical clerkships as the lack of emphasis on female reproduction in Columbia's preclinical curriculum has placed the burden on our own didactics curriculum to be uniquely complete and thorough in covering basic material.Discussions and conclusions/Significance: N/A (Innovations in Medical Education poster submission)Reflection: Significance: This curricular review project is significant as a medical-student-directed innovation in using Bordage's approach to curricular change and applying it to a specific quality improvement challenge. We were able to methodically approach the clerkship's problems of poor performance and low student satisfaction and plan changes in the clerkship that we can now enact and study in a rigorous way. Clerkships are complex and multifaceted and this project, though necessarily reflecting our own narrow institutional experience, offers a method for clerkship improvement that is conceptually-grounded, evidence-based, and can be adapted elsewhere by other clerkships, no matter their specialty field. In the future, we look forward to feedback on our changes, continued adjustment and improvement of our new curriculum based on that feedback, and the addition of more simulation sessions once the Columbia Simulations Lab opens in summer 2016.References: References: Balmer DF, Hall E, Fink M, Richards BF. How do medical students navigate the interplay of explicit curricula, implicit curricula, and extracurricula to learn curricular objectives? Acad med. 2013 Aug; 88(8):1135041. doi: 10.1097/ACM.0b013e31829a6c39. Bordage G, Harris I. Making a difference in curriculum reform and decision-making processes. Med Educ. 2011 Jan; 45(1):87-94. doi: 10.1111/j.1365-2923.2010.03727.x. Stritter FT, Talbert L. An empirical approach to instruction in obstetrics and gynecology. J Med Educ. 1974 Aug;49(8):770-7. "

Poster S-21: A Medical School Writing Center / Writing Fellows Program: Creation, Structure, Implementation

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Purpose/Problem Statement: Problem statement: Scholarly investigation and scientific writing are core components of undergraduate medical education1. At the Alpert Medical School (AMS), there is an unmet need to improve scholarly writing skills. Our goal is to enhance a research culture and create an incubator environment for medical student writing. Our innovation is to create a medical school-based writing center. The core of the writing center will be medical student peer mentors, who provide editorial assistance for scholarly writing efforts of their peers. The center is a stand-alone offshoot of a successful undergraduate writing center. Planned outcome measures : Post-collaboration assessment by students submitting work to Writing Center. Blind reading and grading of pre and post collaboration manuscripts by senior faculty not connected to the ProgramMethods/Approach: Approach: The collaboration of two

senior faculty members (PG, ERF) experienced in student scientific writing with current five 1st year AMS students who will serve as writing fellows; all five students have experience as writing fellows as undergraduates at our institution or elsewhere. Initial funding for the writing fellows is provided by a grant from AMS. Methods: An online survey of Brown medical students (n=136; response rate=33 %) indicated a perceived need for enhanced support for student writing (67%); agreement that a Writing Center would improve my scientific writing (93%). The preferred model (47%) was emailing work to a writing fellow, receiving emailed comments on an original draft then individual meeting with the writing fellow to discuss the writing. Center features include clear manuscript submission guidelines, yearly vetting, selection and training of new writing fellows via a curriculum, including the pedagogy of writing, peer-mentoring in writing, and elements of scientific manuscript organization.Results/Lessons learned: Lessons learned. Limitations of this model include the need to regularly recruit experienced writing fellows and to establish criteria to recruit the most effective ones. Sustainability requires long-term funding from AMS and following key outcome measures, including student satisfaction and their assessment of each writing fellow and student scholarly productivity (e.g., research abstracts or papers).Discussions and conclusions/Significance: Existing medical school writing centers tend to be part of an existing university-wide Center or are staffed by full-time, paid faculty experts.2 Our alternative is a student-driven model based on peer-assisted learning backed by senior faculty support. Our early experience supports the feasibility of this innovation to advance a culture of scholarly writing productivity. Our model is generalizable to resident, fellow and junior faculty efforts.Reflection: We believe that a medical school-based Writing Center can serve as an incubator to foster an infrastructure of medical student scholarly writing and productivity.References: 1 Learning objectives for medical student education: report of the Medical School Objectives Project. Acad Med 1999; 74: 13-18. 2 The value of a writing center at a medical university. Teach Learn Med 2013; 25:129-133

Poster S-22: Global Health and Imaging: Creating Opportunities for Medical Students

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Purpose/Problem Statement: Problem Statement: With the growth of the nascent field of global radiology, medical students are seeking opportunities that combine imaging and global health. While there have been strides made in creating global health experiences for both radiology and emergency medicine residents, opportunities for medical students interested in global radiology remain scant.Methods/Approach: Approach: By creating a one-week self-designed elective during third year, the course aimed to provide an opportunity for medical students interested in global radiology. The elective consisted of literature research and networking with professionals working in global radiology in order to learn more about the current state of the field.Results/Lessons learned: Lessons learned: The project illuminated three key takeways for medical students: 1) NGOs such as RadAid offer volunteer, training and research opportunities; 2) networking with the local medical community, both in the radiology and emergency medicine departments, can create opportunities for medical students abroad; and 3) medical students can conduct literature research that contributes to the field of global radiology.Discussions and conclusions/Significance: -Reflection: Significance: This elective opened doors for medical students interested in the field of global radiology. After the completion of the one-week elective, one student was able to assist with an imaging project in Cambodia, while also conducting literature research in global radiology that led to a publication in the Journal of Global Radiology. This elective can hopefully serve as a springboard for other medical students who hope to serve the medical imaging needs in resource-limited countries.References: Nelson BD, Kasper J, Hibberd PL, Thea DM, Herlihy JM. Developing a Career in Global Health: Considerations for

Physicians-in-Training and Academic Mentors. Journal of Graduate Medical Education. 2012;4(3):301-306. doi:10.4300/JGME-D-11-00299.1. Lungren MP, Horvath JJ, Welling RD, Azene EM, Starikovsky A, Bashir MR, Mollura DJ, Maxfield C. Global Health Training in Radiology Residency Programs. Academic Radiology. 2011; 18(6): 782-791. doi: 10.1016/j.acra.2011.02.009 Wood MF, Lungren MP, Cinelli CM, Johnson B, Prater A, Sood S, Gerber RE. Global Health Imaging Curriculum in Radiology Residency Programs: the Fundamentals. Journal of American College or Radiology. 2014: 11(10): 968 – 973. doi: 10.1016/j.jacr.2014.04.007.

Poster S-23: Clinical case vignettes as an educational initiative to increase medical student scholarly productivity

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Purpose/Problem Statement: Scholarly research and writing skills are vital for medical students. This report describes the structure, development and outcomes of a novel, multi-year initiative based on case vignettes presented by Alpert Medical School (AMS) students at national and regional meetings, including 4 winners and 4 finalists in the American College of Physicians national Medical Student Clinical Vignette Competition from 2000-2010 1. Project objectives: (1) enhance scientific writing skills; (2) increase productivity and participation at scientific meetings; (3) develop a sustainable clearinghouse for case vignette projects. Prior medical student collaborations indicated an unmet need.Methods/Approach: We reviewed retrospectively a non-curricular, ten-year initiative using case reports or small cases series as an educational and scientific writing strategy for medical students. The endpoint for each project was presentation of a clinical vignette at a national or regional scientific meeting. The focus was not on publication. a. Structure : Two voluntary clinical faculty members(ERF, SAS) created and mentored the project. Students were aware of this program by direct faculty contact, announcements in AMS publications, and word-of-mouth referral. Collaborations frequently included additional specialty faculty. Cases reflected an individual student's career interest, if expressed. b. Project development: Faculty and each student jointly selected a case from (a.) student or faculty clinical experience (b.) solicitation of cases from colleagues via email and direct contactResults/Lessons learned: A total of 75 students had case vignette projects accepted and presented as oral or poster presentations at regional or national medical meetings. An additional 11 projects were not finished and 8 others were rejected. Although not the goal, 22 of these students also published vignettes in medical journals. This initiative is time intensive for faculty.Discussions and conclusions/Significance: Our results indicate that case reports for presentation is a viable strategy to introduce medical students to scientific writing 2. Our objective, presentation of case-based, clinical vignettes at scientific meetings, differs from the traditional focus on publication. A unique feature was case-finding congruent with career interest. For example, a student planning a dermatology career, presented a project at a national meeting on 4 cases of "Melanoma presenting as rectal bleeding" with a dermatologist as one co-author.Reflection: Our study has limitations. The feasibility, quality and impact of this initiative was assessed only indirectly by sustainability, success and continued student interest. Prospective post-collaboration assessment by students is planned. A future goal is added core faculty to develop one infrastructure for scientific writing and scholarly productivity by studentsReferences: 1 The CARE guidelines: consensus-based clinical case report guideline development. J Clin Epidemiol 2014; 67: 46-51 2 In defense of case reports and case series. Ann Int Med 2001; 134: 330-334

Poster S-24: Flexible Clinical Elective in Breast Imaging

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Purpose/Problem Statement: Medical students do not have adequate opportunities during their early clinical years to explore subspecialties due to the focus on core clerkships (medicine, surgery, etc). Previous studies have shown that exposing students to experiences early can change their perceptions of a specialty and influence their career choice (ref. 1-3).Methods/Approach: To combat the lack of exposure to subspecialties in the early clinical years our institution created flexible clinical experiences (FCEs), one week electives for medical students, to explore a variety of clinical and translational science fields that they might not otherwise get exposed to until later, if at all. This early exposure includes the opportunity to foster mentorships, increase interest in the specialty and to motivate further learning in the chosen field(s). The goal of the Breast Imaging FCE is to (1) expose medical students to radiology early to see if it is the right career choice for them and (2) to allow medical students going into a non radiology specialty that involves the use of breast imaging studies to better understand breast imaging as it relates to their specialty.Results/Lessons learned: With this early exposure the hope is that interest in radiology, and/or breast imaging specifically, will increase. In addition the hope is that long term students that go into specialties that utilize breast imaging will better know what test to order and how to interpret/act on the results. Overall there has been a lot of enthusiasm for the breast imaging FCE with medical students consistently enrolling and having a good experience.Discussions and conclusions/Significance: n/aReflection: While this type of clinical experience has been shown to be successful increasing knowledge and interest in other fields (ref. 1-3) is has yet to be done in breast imaging. This FCE could lead to an increase in the number of medical studies going into radiology residencies from our institution.References: 1. Hilmes MA, Hyatt E, Penrod CH, Fleming AE, Singh SP4.Radiology in Medical Education: A Pediatric Radiology Elective As a Template for Other Radiology Courses. J Am Coll Radiol. 2015 Oct 16. pii: S1546-1440(15)00807-8 2. Zuckerman SL, Mistry AM, Hanif R, Chambless LB, Neimat JS, Wellons JC 3rd, Mocco J, Sills AK, McGirt MJ, Thompson RC. Neurosurgery Elective for Preclinical Medical Students: Early Exposure and Changing Attitudes. World Neurosurg. 2015 Sep 7. pii: S1878-8750(15)01125-0. 3. Wang JY, Lin H, Lewis PY, Fetterman DM, Gesundheit N. Is a career in medicine the right choice? The impact of a physician shadowing program on undergraduate premedical students. Acad Med. 2015 May;90(5):629-33

Poster S-25: Efficacy of Medico-Legal Exposure: Impact on General Surgery Residency Practice Management

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Purpose/Problem Statement: Every physician will face some legal dispute where an awareness of the issues and how to approach them would be invaluable. Residents nearing the end of their surgical training continue to have very limited familiarity with medico-legal issues. At our academic institution, we have created an open and structured medico-legal/quality insurance education for the General Surgery residents. In an era where evidence-based medicine is the basis for the standard of care, physicians who practice defensive medicine out of a misunderstanding of the law do a disservice to their patients. Defensive medicine carries its own costs, financial and otherwise [1,2]. The institution aimed to reduce cost, length of stay, by educating and familiarizing residents on the consequences of their laboratory and diagnostic

testing along with their medicine prescribing habits. With continued education, reiteration and open discussions, patient care is optimized to help minimize medico-legal issues to improve overall patient safety.Methods/Approach: This was a retrospective, longitudinal study over a 3-4 year period. A questionnaire was voluntarily completed by all levels of General Surgery residents and returned either by hand or by email. The General Surgery residency was based in an academic university hospital. Residents were exposed to dedicated hospital quality insurance meetings, expert medical testimonies as well as daily clinically directed computer literature search for evidence based guidelines and protocols as accepted standards of care.Results/Lessons learned: 56 General Surgery residents, 30 males and 26 females, responded over this 3-4 year period with more questionnaires being completed at the time of this abstract submission. Regardless of PGY level, the General Surgery residents reported that Morbidity and Mortality conferences, 88% and internet access to literature review, 80% as their main and most effective source for information for their assessments and treatment plans. Dedicated meetings/lectures, 49%, and clinical experience, 48%, were less perceived as sources of their clinical decision making. Over 80% of the surveyed residents did not change their clinical management based on negative outcomes or fear of medico-legal consequences.Discussions and conclusions/Significance: In an already high risk field, residents already had well formed concepts of medico-legal issues. Although each resident was aware of specifics of informed consent, the residents state that documentation, 87%, was their most deficient of their clinical duties. 83% of all residents felt competent in discussing risks, benefits and complications with patients. Being less experienced, interns responded 70% while chief residents responded 100% competent in discussing particulars to patient cares and operations. From intern to chief resident, greater than 80% of residents used the internet for clarification of evidence basec medicine for formulating their assessments and treatment plans. Each resident cited access to protocol and literature as their basis for patient care.Reflection: Graduate medical education in the United States does a poor job of training surgical residents about the legal realities of medical practice. It has also been shown that physicians who do not understand the broad strokes of the legal landscape are prone to make risk-management decisions based on lore rather than fact -leading to the much-maligned practice of defensive medicine" [3]. It leads to unnecessary testing, hospitalizations and potentially harmful false positives. With adherence to evidence based medicine guidelines and protocols, General Surgery residents in our institution showed more reliance on accepted medical practices to help minimize unnecessary laboratory and/or diagnostic imaging. With continued education and reiteration, patient care is optimized to help minimize medico-legal issues to improve overall patient safety.References: 1. Studdert, DM, Mello, MM, Sage, WM, et al. Defensive medicine among high-risk specialist physicians in a volatile malpractice environment, JAMA. 2005: 293 (21): 2609-2617. 2. US Congress, Office of Technology Assessment. Defensive Medicine and Medical Malpractice. OTA-H-602. Washington, DC: US Government Printing Office; 2004.http://biotech.law.lsu.edu/policy/9405.pdf.Accessed April 16, 2008. 3. Joint Commission Perspectives on Patient Safety. Defensive medicine: physician's fear of lawsuits may affect treatment. Joint Commission Resources. 2005; 5912); 5-5(1). "

Poster S-26: A selective course for medical students on high value care

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Purpose/Problem Statement: Health care spending in the US is the highest in the world; yet the World Health Organization ranked the US 37th in the overall health system performance among 191 countries.1 Even more problematic is the fact that 30% of total health care costs, $750 billion per year, is spent on unnecessary health services, frauds and inefficiencies. 2 To address

these challenges, several national efforts are in place to educate hospitals and physicians to adopt high value, cost effective care. These include Choosing Wisely initiative as well as the American College of Physicians (ACP), and the Alliance for Academic Internal Medicine (AAIM) initiatives to teach residents and practitioners about how to incorporate high value care in their practice. Moreover, The Institute for Health care Improvement (IHI) developed a framework called “Triple Aim” to optimize health system performance, through three main goals: improving the patient experience with health care, improving the health of populations, and reducing the per capita cost of health care. Despite these national initiatives, formal medical school curricula on high value care are limited. We describe our approach to training medical students in high value and quality care.Methods/Approach: We developed a four-week selective course called Business of Medicine: Quality and Value (BoM) that medical students are offered as a selective in the final phase of our curriculum. Themes including Health Care systems, High Value Care and Patient Safety and Quality Improvement are taught using interactive learning modules adopted from MedEd Portal and ACP high value care curriculum. Knowledge, skills, attitudes and behaviors related to high quality care will be examined with a mixed methods approach and compared to a control group of students who are not enrolled in the BoM course. A 20-item survey will be administered at the beginning and end of the course and analyzed with an analysis of variance. In order to monitor the performance of students throughout the course, we will assign case based group discussions, reflective narratives and a summative Objective Structured Clinical Examination (OSCE). Qualitative analysis will be done on the reflective narratives to assess for common themes. We hypothesize that medical students enrolled in the BoM course will develop increased knowledge, skills, attitudes and behaviors towards providing cost-quality conscious care for their patients, compared to their peers without such training.Results/Lessons learned: The course will be offered in the spring of 2016, and we are currently in the preparation stage. We foresee two possible challenges that we are working on preparing for. To provide all enrolled students with an opportunity to apply their knowledge in a clinical setting, we are coordinating with emergency medicine physicians in Stony Brook University Hospital. We also plan on beginning every session with clinical cases to give students an opportunity to practice making appropriate clinical decisions. An additional concern regarding the study methods is to assure the effective participation of students in the control group in answering the survey. We have designed the survey to be brief and we have made arrangements to provide the volunteers with a $10 Starbucks gift card as an incentive.Discussions and conclusions/Significance: With the increasing expenses of our health care, training medical students in high value care is essential to provide the health care system with physicians who are capable of overcoming these major obstacles. It is our view that providing medical students with an exceptional learning experience in high value care is essential to improving the future of our existing healthcare system. Training in cost conscious and high value care during their formative years may positively influence physician behaviors in the future.Reflection: N/AReferences: 1. Institute of Medicine. Best Care at Lower Cost: The Path to Continuously Learning Health Care in America. Washington, DC: National Academies Press; 2012. 2. World Health Organization. The world health report 2000. Health systems: improving performance. WHO; 2000.

Poster S-27: Re-Thinking On-Doctoring Courses for the Clinical Year Using Template-Inspired Innovation

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References: -Session Outline (90 minutes): 0-10: Background Our curriculum re-format Defining reflection Designing focused sessions to encourage self-change 10-30: Participating in Template-Inspired Innovation Session leaders will guide the group through a seminar created using TII 30-70: Practicing Template-Inspired Innovation Participants will work in groups and use TII to create original materials based on an actual seminar offered at a participant's home institution 70-90: Closing Remarks Groups will discuss the process of using TII and their final designs with feedback from leaders and other participantsLearning Objectives: During the workshop, participants (e.g., medical students, course faculty, clerkship directors, and non-medical education specialists) will: 1. Receive a brief presentation on the advantages and limitations of TII 2. Experience a seminar designed using TII 3. Practice using TII as a team to develop plans for a seminar 4. Engage in a critical discussion about using TII 5. Generate materials for potential use at their home institutionMethods/Approach: The process of progressing from first-year medical student to medical professional involves complex identity negotiations. Multiple models for this process have been articulated,1,2 and most share the central idea that a pre-existing identity must be socialized into a professional identity. This process of socialization is under the influence of a number of external factors, including learning environment, role models, formal teaching, and experience.3 To take on the role of "doctor" necessitates some degree of identity negotiation;2 however, sacrificing foundational and personal values can result in discordance between values in personal and professional life, which may contribute to "cynicism, depression, educational dissatisfaction, loss of empathy, crises of conscience, stunting of moral growth, and ethical erosion".4 Among the factors exerting influence on the process of socialization, the curriculum may be the most extensively discussed in the medical education literature. Perhaps of greatest concern is the hidden curriculum – those lessons, beliefs, and norms that are transmitted but not intentionally taught – as this curriculum may be undetected by members of the field who have previously undergone socialization. This hidden curriculum is nonetheless capable of conveying ideals and values contrary to those stated in the formal curriculum.3 Novices, such as medical students entering their clinical year, are uniquely positioned to recognize dissonances between what is stated as expected and "how things really work," and can thus capture the content of the hidden curriculum by narrativizing and reflecting on their own experiences, especially in the form of written word.3 Reflection of this kind may enable students to benefit from positive elements of the hidden curriculum while escaping the attrition of professional values that is normally caused by negative elements of the hidden curriculum.3,5 Thus, one solution is to use "on-doctoring" courses, which emphasize humanistic values, to assist students in identifying and navigating the hidden curriculum. Unfortunately, clinical schedules are complex, experiences are variable, and student needs are inconsistent between student groups. These factors make it difficult to develop a centralized on-doctoring curriculum for the clinical year that consistently facilitates reflection by student participants. Our aim was to develop a method that accomplished two goals: (1) to allow course leaders, who include numerous faculty and senior students, to create innovative seminars that were specific to their group's needs, and (2) to ensure seminars were of high-quality, covered important themes, and consistently facilitated reflection by student participants. At the College of Physicians and Surgeons (P&S), we re-formatted our own clinical year on-doctoring course (Major Clinical Year: Foundations; MCY-F) to include eight rotation-specific templates that share a common meta-structure. For each seminar, students respond to an open-ended prompt the day beforehand. The seminar begins with a clear statement of goals and an opportunity for students to re-read their writing. (Themes included identifying role models, considering sociocultural factors in clinical management, and balancing empathy and efficiency.) A "primer activity" experientially introduces abstract concepts to be considered during the seminar. The group then transitions to open discussion about concrete experiences. The seminar ends with a second writing prompt that invites students to privately reflect and commit to making personal change. By encouraging our teams of faculty and senior students to

innovate within this structure but to maintain the stated goals, it is possible for classroom leaders to create novel plans that reflect their students' needs, but ensure the level of quality and central themes are reproducible between different student groups. We call this process "template-inspired innovation (TII)."

Poster S-28: Association between Knowledge and Performance in Clerkships, and USMLE Step 2 Scores: Implications for Counseling and Academic Decisions

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Purpose/Problem Statement: Step 2 CK scores is of increasing importance in medical student career planning. In the National Resident Matching Program 2014 Program Director Survey, Step 1 scores were the highest-rated among 33 factors used in screening applicants to be interviewed (94% cited it with a mean rating of 4.1 on a 5 point Likert scale); Step 2 scores were rated fourth in importance (80% cited it, mean rating of 4.1). When citing factors for ranking a given applicant, Step 1 scores ranked 5th (80% cited, with mean rating of 4.1) and Step 2 CK scores ranked 7th (71% cited, with mean rating of 4.1) Previous studies have shown a relationship between Step 2 scores and subsequent board certification,[i] and that women outperformed men in most content areas in Step 2[ii]. The purpose of this study was to determine if it was possible to identify, or predict, a student's Step 2 score based on their knowledge and performance in clerkships, as measured by final clerkship grade and after adjusting for background factors, such as preclinical knowledge.Methods/Approach: Our sample was comprised of 1,283 SKMC students who took Step 1 for the first time between 2010 and 2014. The demographics were as follows: mean age at matriculation 23.4, white 64.5%, Asian 16.5%, Indian/Pakistani 10.8%, Hispanic 5.3%, African-American 2.4%, other ethnic groups 14.6%, and women 50.4%. The mean Step 1 score was 226.1. Multiple linear regressions were performed on Step 2 scores using the following as predictors: demographic variables, Step 1 scores, NBME Subject Examination scores in 6 clerkships, and faculty global ratings of students' clinical performance (independent of NBME Exam scores) in 6 clerkships.Results/Lessons learned: We found 10 variables that were related to Step 2 scores in a full regression model with an r-square of 0.69 ($p<0.00001$). All NBME exam scores had significant ($p<0.0001$) weights in the model, with Medicine being the highest, followed by Ob-Gyn, Pediatrics, Family Medicine, Surgery, and Psychiatry. Only the MCAT Physical Science subtest reached significance with $p<0.03$. The weight for Step 1 was significant ($p<0.0001$) and its beta value indicated that it was the most important of the 10 predictors.. While the majority (53.5%) of students took Step 2 in June, July or earlier at the end of their third year, students who delayed taking Step 2 until later in their fourth year experienced a small, but significant ($p<0.0001$) decline of about 0.6 points per month. Pediatrics was the only clerkship whose faculty ratings of students' clinical performance yielded a significant ($p<0.03$) weight in the regression model. Gender and ethnicity were not found to be significant factors.Discussions and conclusions/Significance: Despite the intent of the USMLE examination as establishing minimal competency for licensure, both Step 1 and Step 2 scores are rated highly in terms of factors influencing candidacy and ultimate ranking. Our data demonstrates that a student's Step 1 score and their NBME shelf exam scores were the strongest predictors of their Step 2 score. The strong associations between knowledge acquired in clerkships and performance on Step 2, after adjusting for preclinical knowledge, may have implications for curriculum design as

residency program directors place increasing emphasis on Step 2. Students seeking highly competitive residencies, as well as students with average or below-average academic records need to focus on their NBME clerkship exams scores as any weaknesses may predict lower than expected Step 2 performance.Reflection: Students seeking highly competitive residencies, as well as students with average or below-average academic records need to focus on their NBME clerkship exams scores as any weaknesses may predict lower than expected Step 2 performance.References: [i] Silber CG, Veloski JJ. Board certification in obstetrics and gynecology: Associations with physicians' demographics and performances during medical school. Am J of Obstetrics and Gynecology. (2005) 192, 318-22 [ii] Cudd MM, Swanson DB, Clauser BE. A multilevel analysis of the relationships between examinee gender and United States Medical Licensing Exam (USMLE) Step 2 CK Content area performance. Academic Medicine, Vol. 82, No. 10/ October 2007 Supplement

Poster S-29: Making them think: Use of reflection in early clinical experiences

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Purpose/Problem Statement: The goal of this project was to provide students in Doctoring in Vermont opportunities to critically analyze their clinical experiences through reflection. Utilization of reflection exercises encourages students to develop a deeper understanding of the challenges our patients and clinicians experience within the healthcare system and strategies for improving healthcare outcomes.Methods/Approach: Initial clinical experiences for medical students are largely observational, focused on acquisition of medical knowledge and providing an introduction to the clinical setting. These experiences can provide invaluable opportunity to develop an awareness of challenges and assets for patients and practices. As part of a 5 year HRSA funded grant the TOPMEd (Team Oriented, Patient-centered, Medical Education) curriculum was created. This curriculum prepares medical school graduates to provide team oriented and patient-centered medical care emphasizing rural and underserved communities. One component of TOPMEd was the modification of Doctoring in Vermont (DIV), a pre-clinical experiential longitudinal course in which students shadow primary care physicians.Results/Lessons learned: Eight key topics were identified: the role of medical team members, the role of the PCP, the impact culture, the impact of differing abilities, the impact of healthcare reform and financing, continuity of care, shared decision making and motivational interviewing, and the use of evidence based medicine in primary care. Students were required to reflect upon 4 questions, one question after each DIV session. Fall and Spring semester reflections for the Class of 2017 were analyzed using theme analysis to assess student's awareness of healthcare systems and social determinants of health and their impact on patients' health.Discussions and conclusions/Significance: Theme analysis results will be presented for each of the eight topics. The most common themes within each topic and descriptive quotes will be presented. In addition, similarities and differences in themes between the semesters will also be presented.Reflection: The DIV reflection component appears to reinforce the TOPMEd curricular goals by enhancing student appreciation of the value of primary care, team-oriented care, how patient diversity impacts care. The limitations of this research include variation in students' experiences at different clinic sites as well as student engagement with the assignment. Reflection analysis is limited by student choice of reflection topic question emphasizing some topics with greater frequency than others. Reflection indicates that students are increasingly aware of these topics and the reflection assignment is a valuable educational tool for this curriculum. Future directions include conducting a comparative analysis of subsets of students' responses over time based on specialty choices. The analysis of student

reflections also provides insight into potential areas for faculty and curriculum development.References: Bowen, G. A. (2008). Naturalistic inquiry and the saturation concept: a research note. Qualitative research, 8(1), 137-152. Sandars, J. (2009). The use of reflection in medical education: AMEE Guide No. 44. Medical teacher, 31(8), 685-695.

Poster S-30: The Stony Brook Teaching Families: a longitudinal case study design to introduce clinical concepts in the preclinical years.

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Purpose/Problem Statement: Contextual learning assigns meaning to seemingly discrete information and can enrich the learning experience of medical students. In particular, patient narratives have long been used to teach students to apply their medical knowledge to diagnose a patient based on their signs and symptoms [1]. The traditional preclinical phase is limited by few isolated patient narratives and often do not address the complex psychosocial issues that influence patient care. The integration of basic science, physiology, and pathophysiology content provides an important link between these areas of medical knowledge, but the application of this knowledge to an actual patient would greatly improve the understanding and retention of this information. Although it is impractical to have an actual patient for each concept and medical condition, we developed a novel way to introduce contextual learning to integrate basic science and clinical topics in the preclinical phase.Methods/Approach: We offered a curriculum integration grant to challenge faculty to create longitudinal rich narrative case studies [2] centered on a single family that would represent real life families with complex medical and psychosocial issues. Five cases were selected for funding and included teams of interdisciplinary faculty. Each of the Stony Brook Teaching Families (SBTFs) have one or two main medical themes (i.e., diabetes, psychiatric disorders), and common psychosocial issues related to the medical theme. The goal was to integrate the SBTFs into the current preclinical coursework which spans an 18 month timeframe. Faculty created videos, team based learning (TBL) sessions, group discussions linked to AAMC/LCME hot-topics, and exam questions to introduce students to the various SBTFs and their biopsychosocial dilemmas.Results/Lessons learned: We are currently in the second round of implementing the SBTFs, and have increased the number of visits and the level of student engagement compared to the first round. Initial integration attempts between the SBTF faculty and preclinical faculty were difficult, however a series of retreats opened communication lines. Finally, SBTF faculty found it challenging to create meaningful lessons that could be incorporated into a recently restructured curriculum.Discussions and conclusions/Significance: This is the first report using fictional families as a longitudinal rich narrative case study to enhance contextual learning in medical education. The inherent value of introducing students to the complex nature of medical conditions, both biological and psychosocial, may improve their ability to treat patients in a more holistic manner when they enter their clinical clerkships. Furthermore, more medical schools are moving toward an integrated curriculum, making it essential for students to link basic science knowledge to clinical care earlier on in their education.Reflection: N/AReferences: 1. Greenhalgh, T., Narrative based medicine: narrative based medicine in an evidence based world. BMJ, 1999. 318(7179): p. 323-5. 2. Bizzocchi, J. and R. Schell, Rich-narrative case study for online PBL in medical education. Acad Med, 2009. 84(10): p. 1412-8.

Poster S-31: Student-designed experiences to explore patient-reported outcomes in medical care

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Purpose/Problem Statement: Physicians use pain scales as a tool to assess if treatment is effective. Beyond pain scales, physicians primarily rely on clinical data (e.g., physical exams, lab tests) to assess treatment impact. Medical research has used standardized patient-reported

outcome measures (PROs) since before 1989. However, clinical care adoption has been limited and the potential of PROs to inform care is currently not included in the medical school curriculum. Tarlov et al believed that through use of PROs physicians will have a better understanding of how the patient interprets the impact of his or her medical condition on day to day life. With this understanding, the physician can tailor a specific treatment to the patient's needs such that the patient can return to healthy physical and emotional function lead their daily lives unencumbered by their medical condition or the side effects of their treatment. The authors hoped the institution of PROs would help to detect and explain decreased functional capacity, track changes in function over time, consider the patient's total functioning in choosing among different therapies, guide efficient use of community resources and social services and predict more accurately the course of a chronic disease1. Today, PROs are a foreign concept to medical students with few exceptions.Methods/Approach: n/aResults/Lessons learned: The flexible clinical experience (FCE) program at the University of Massachusetts Medical School is a valuable addition to the curriculum in which MS3 students can pursue individual interests early in their medical training. The FCE supplements student education and allows exploration of ideas and novel concepts. The premise of my FCE was to learn how PROs influence the way physicians include patients in evaluation of treatment impact. With the help of my advisor, I performed extensive literature reviews which culminated in an Op-ed piece about the future use of PROs in the medical field. I periodically had meetings with my FCE mentor to ascertain that I was on track. While researching the importance and implementation of PROs in orthopedics, it was apparent that their slow adoption in the United States was multi-tiered with the most glaring obstacle being the logistics of how to efficiently install a program like this into doctors' offices. As a result, I supplemented my Op-ed piece with a FAQs brochure about PROs and proven steps in which offices can take to successfully implement PROs in a way that won't disrupt the flow of the office2.Discussions and conclusions/Significance: N/AReflection: Lessons Learned: Office-based use of PROs is emerging as important to patient centered care and it is essential for medical students to realize that in the future, PRO capture will become the norm. By incorporating an introduction to PROs into the medical school curriculum, medical students become familiar with their uses and advantages. Initially, this can be accomplished by including a lecture segment for the fourth years who are taking part of the orthopedic surgery elective. Eventually, PROs can be introduced when medical students begin to learn about patient care and diagnostic tools. My hope is that students will be exposed to how PROs incorporate the patient's perspective in the evaluation of treatment plans, which can help shape how physicians decide to care for their patients. Significance Today, PROs are utilized to assess pain and disability to inform when and if patients should undergo joint replacements.3 Medicare will now reimburse for collecting PROs before and after total joint replacement. However, PROs transcend specialties and can be used in all fields of medicine to monitor treatment outcomes. As a medical student, it's important to be aware of patient-centered strategies that can accurately track if patients are benefiting from a certain treatment. PROs are an excellent way to not only actively involve patients in their medical care, but for them to see what they, or we as physicians, can do to optimize their care.References: [1] Tarlov AR, Ware JE, Jr, Greenfield S, Nelson EC, Perrin E, Zubkoff M. The Medical Outcomes Study: An Application of Methods for Monitoring the Results of Medical Care. JAMA. 1989;262(7):925-930. [2] Franklin PD, Lewallen D, Bozic K, Hallstrom B, Jiranek W, Ayers DC. Implementation of Patient-Reported Outcome Measures in U.S. Total Joint Replacement Registries: Rationale, Status and Plans. J Bone Joint Surg Am. 2014;96:104-109. [3] Franklin PD, Allison JJ, Ayers DC. Beyond joint implant registries: a patient-centered research consortium for comparative effectiveness in total joint replacement. JAMA. 2012 Sep 26;308(12):1217-8.

Poster S-32: Introducing Alpert Medical Students to Quality Improvement and Patient Safety: A Pilot Workshop

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Purpose/Problem Statement: Over the past ten years, improving patient outcomes and decreasing avoidable errors has received increased attention in medical education programs. The heightened visibility of quality improvement (QI) and patient safety (PS) results from multiple studies, which report on the gaps between health care services that patients receive and what they could be receiving (Wong, Levinson et al. 2012). A study published in the Journal of Patient Safety estimates that more than 400,000 premature deaths per year are due to preventable medical errors (James 2013), signaling the necessity of educating health professionals of all levels in the knowledge and skills of patient safety and quality improvement.Methods/Approach: In collaboration with the Association of American Medical Colleges (AAMC) and the Medical Education Office at Alpert Medical School (AMS), medical students at AMS created and held a QI/PS workshop for a small group (N=17) of 2nd year medical students. Prior to the workshop, attendees completed selected online modules by the Institute for Healthcare Improvement (IHI). The workshop aimed to introduce students to the principles and practice of QI/PS and provide them with a skillset to design their own QI/PS projects. Components of the workshop included an introductory systems-based activity, a brief lecture, and two interactive cases to balance didactic and hands-on instruction. Student learning was evaluated via performance on the Quality Improvement Knowledge Application Tool-Revised (QIKAT-R) before and after completion of the workshop (Singh, Ogrinc et al. 2014). The QIKAT-R provides case scenarios and requires respondents to answer open-ended items formulating the aim, measures, and change of a potential QI/PS project. Responses are scored with a standardized, validated rubric. Students also completed an indirect assessment in the form of a retrospective pre-post questionnaire that measured perceived learning and gave opportunities to provide feedback on workshop components.Results/Lessons learned: Student scores on the QIKAT-R increased for aims, measures, and changes, with student aims showing the largest improvement. Subjective feedback from the indirect assessment demonstrated increased student satisfaction and improvement in perceived QI/PS self-efficacy. By the end of the workshop, students not only gained knowledge of QI/PS basics but also were able to recognize system-based errors, identify measurable changes, and implement those changes to prevent future errors.Discussions and conclusions/Significance: Improvement in perceived knowledge of QI/PS principles and ability to formulate solutions to cases amongst workshop participants suggests the efficacy of the intervention in introducing QI/PS to medical students. The workshop may form a framework for other medical schools looking to incorporate QI/PS into their curricula and contribute to the eventual goal of improving the quality of medical care.Reflection: Moving forward with this project, we plan to re-evaluate the strengths and weaknesses of the workshop based on the critique and comments we received when we presented our work for a project review to the AAMC. We are also hoping that we can expand the availability of the workshop to the first year medical students and integrate it into their curriculum so they are exposed to QI/PS concepts earlier in their medical education.References: 1) Wong, B. M., W. Levinson, et al. (2012). Quality improvement in medical education: current state and future directions." Med Educ 46(1): 107-119. 2) James, J. T. (2013). "A new, evidence-based estimate of patient harms associated with hospital care." J Patient Saf 9(3): 122-128. 3) Singh, M.K., G. Ogrinc, et al. (2014). “The Quality Improvement Knowledge Application Tool Revised (QIKAT-R).” Acad Med 89(10): 1386-1391. "

Poster S-33: Enhancing Medical Education Using Students as Teaching Partners in the Curriculum

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Purpose/Problem Statement: 1. Participants will gain knowledge regarding the benefits and facilitators of using student teachers to facilitate curricular change. 2. Participants will gain knowledge regarding potential roles for students in medical curricula.Methods/Approach: Many medical schools are engaged in efforts to enhance the learning experience of students through curricular integration and other restructuring efforts. While the curriculum is evolving, many of the instructional strategies needed to achieve the desired goals are missing. Models where students serve in teaching roles have been highly utilized in school-age curricula. However, these techniques have not been widely embraced for use in developing physician educators. The session will describe an approach to using medical students as teaching assistants in various roles. At the University of Vermont's College of Medicine, a Teaching Requirement was developed and instituted as part of the Vermont Integrated Curriculum (VIC) and delivered in the student's fourth year in the Advanced Integration component of the curriculum. The goal is to provide students with basic skills in teaching and evaluation in a "coached" environment; and to revisit foundation sciences by teaching. Teaching in a VIC foundations course provides an opportunity to learn by teaching. The practicum comprises one month continuous participation as a teaching assistant in foundations courses and completion of teaching workshops during the month. Course specific duties vary according to the VIC course.Results/Lessons learned: Over 5 years of data from end-of-course evaluations and a follow up into residency survey indicates several positive outcomes for courses that use student teachers. Student quotes will be used to give examples of benefits to curriculum and to student learning goals.Discussions and conclusions/Significance: n/aReflection: Advantages of using students in teaching roles for medical curricula include a low cost to the institution, readily accessible, motivated to work with their peers, open to innovations in instruction, and the potential to provide feedback to faculty and students regarding the future application of the material that is taught. Additionally, there are benefits for the student teacher who makes gains in both cognitive and social skills.References: 1. Report IV: Contemporary Issues in Medicine: Basic Science and Clinical Research, Association of American Medical Colleges., Medical School Objectives report, August 2001 2. Soriano, R., Blatt, B., Coplit, C. CichoskiKelly, E., Kosowicz, L., Newman, L., Pasquale, S., Pretorius, R., Rosen, J., Saks, N., and Greenberg, L. (2010) Teaching Medical Students How To Teach: A National Survey of Students-As-Teachers Programs in U.S. Medical Schools." Academic Medicine, 85 (11), 1725-1731.

Poster S-34: Sociogogy in the context of Small Group Learning Communities: an approach to Y1 Pharmacology Medical Education

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Purpose/Problem Statement: Pharmacology can be one of the most intimidating subjects taught in medical school, and medical students often report anxiety and difficulty with assimilating the extensive pharmacology content required of them. To mitigate this we exploited sociogogy (i.e., social pedagogy) as an educational paradigm. The diffusion of internet connectivity, mobile devices, and participatory media has cultivated a context for more peer-based and networked learning1. This emerging sociogogy emphasizes guided discovery, collegial creation of original work, and learners leading one another2. It offers educators an alternative means to address

new learning demands brought on by an abundant and growing world of knowledge.Methods/Approach: We have taken a practical approach to incorporating sociogogy into Year 1 undergraduate pharmacology medical education, organized around two components: - Small group wiki communities - Peer-mentoring (i.e., learners leading one another) N=90 Year 1 students were assigned to small group communities of 5 participants each using the wiki collaborative tool in the Blackboard learning management system. Wikis are websites that permit collaborative modification, extension, or deletion without any defined owner or leader, allowing content to emerge according to the activity of its users. 15 wiki assignments centered around pharmacokinetics and pharmacodynamics, and delivered in the context of familiar over-the-counter drugs, were distributed across the Year 1 curriculum: Foundations of Science I (6), Foundations of Science II (3), Musculoskeletal & Integument (1), Neuroscience-Head & Neck Anatomy (3), Heart-Lung-Kidney (1), GI-GU-Reproduction (1). Students had ~ 1 week per assignment to each answer 1 of 5 questions and provide comments in response to other student posts. The questions were designed to not have neat, easily 'Google-able' answers and were delivered in the context of common over-the-counter medications. N=15 Year 2 students were recruited to participate as wiki community peer mentors. The wikis were monitored by faculty members expert in the content area who also made comments and ensured that student work was satisfactory.Results/Lessons learned: Year 1 focus groups noted that the wiki communities and peer mentors were a safe environment for intellectual risk-taking, promotion of adaptive learning behaviors, and tactful peer correction/teaching. In addition they provided a student-centered and student-driven forum for students to develop a conceptual framework that fostered mechanism-based learning rather than rote memorization of pharmacokinetics & pharmacodynamics. Assessment data indicated an improvement in pharmacology performance and engagement that persisted into the Year 2 curriculum. Once in Year 2, the same N=90 students were assessed using National Board of Medical Examiners (NBME) customized exams covering the following drug classes: antimicrobials, immunomodulators, antineoplastics, environmental & occupational poisons, and hematologic drugs. Summative assessment data indicated a mean correct score of 88% for students using the ANKI materials compared to 82% for a Step 1 reference group (first-time takers from accredited schools) on the same questions. Focus groups noted that students felt most-at-ease with pharmacology compared to other Step 1 content areas, as well as themes of ‘instilled confidence’, ‘positive encouragement’, and ‘made learning progress explicit’.Discussions and conclusions/Significance: n/aReflection: One potential improvement to this innovation would be to have Year 2 students introduce it to incoming 1st years and present their subjective experiences along with the objective data from the NBME exams. Future plans include following the current cohort of N=90 students to USMLE Step 1 and beyond into their 3rd & 4th year clerkships, to assess the impact of this sociogogical approach had in preparing them for clinical practice. In conclusion, this medical education innovation is readily adaptable to other medical schools and medical education disciplines.References: 1. Saveria and Chwierut (2011), ‘The Future of Learning Agents and Disruptive Technology’, Institute for the Future; http://www.knowledgeworks.org/future-learning-agents-and-disruptive-innovation. 2. Chavez, Ruby-Asuncion, Turalba, and Malik (2006), ‘Teaching Public Health Through a Pedagogy of Collegiality’, American Journal of Public Health, Vol 96 (7): 11751180.

Poster S-35: Cognitive Schemata and Digital Spaced-Learning Media: an approach to Pharmacology Medical Education

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Purpose/Problem Statement: Pharmacology can be one of the most intimidating subjects taught in medical school, and medical students often report anxiety and difficulty with assimilating the extensive pharmacology content required of them. To mitigate this we have taken a practical approach to incorporating e-learning into undergraduate pharmacology medical education1, organized around two components: - Cognitive schemata generated by blended-learning - Digital spaced-learning mediaMethods/Approach: Cognitive research has demonstrated that the mind stores information in frameworks or schemata2. Students more readily acquire pharmacology knowledge – mechanisms, drug targets, modes of action, adverse effects...etc. – by integrating information about drugs into what they already know about biological and physiological pathways rather than just memorizing facts. Therefore, during Year 1, 15 online modules and 15 integrated lectures were delivered for N = 90 students to build pharmacokinetic and pharmacodynamic cognitive schemata. Modules included a case vignette, online didactic teaching video, over-the-counter (OTC) drug wiki assignment and cumulative concept map. The modules integrated with lectures delivered throughout the systems biology curriculum of Year 1. Upon transitioning to Year 2, faculty-authored ANKI flashcards were provided to the same N = 90 students to consolidate therapeutic drug knowledge into the cognitive schemata constructed in Year 1. ANKI is a spaced repetition flashcard program that incorporates increasing intervals of time between presentations of material in order to exploit the psychological spacing effect3 (i.e., the phenomenon whereby humans more easily learn items when they are studied multiple times spaced over a long time span). Although the principle is useful in many contexts, spaced repetition is commonly applied when a learner must acquire a large number of items and retain them indefinitely in memory. The program scheduled future presentations of the information based on spaced repetition algorithms. This allowed the knowledge content to be fine-tuned to each individual student such that difficult material was presented more frequently for recall and re-encoding, and easier material less frequently.Results/Lessons learned: Year 1 focus groups noted that the cognitive schemata and digital spaced-learning media enabled provided a student-centered and student-driven means to develop a conceptual framework that fostered mechanism-based learning rather than rote memorization of pharmacokinetics & pharmacodynamics. In Year 2, students were assessed using National Board of Medical Examiners (NBME) customized exams covering the following drug classes: antimicrobials, immunomodulators, antineoplastics, environmental & occupational poisons, and hematologic drugs. Summative assessment data indicated a mean correct score of 88% for students using the ANKI materials compared to 82% for a Step 1 reference group (first-time takers from accredited schools) on the same questions. Focus groups noted that students felt most-at-ease with pharmacology compared to other Step 1 content areas, as well as themes of ‘instilled confidence’, ‘positive encouragement’, and ‘made learning progress explicit’. As an example of participatory media, students valued the ANKI technology for being flexible and individualized, able to pinpoint and draw attention to areas of strength as well as knowledge gaps.Discussions and conclusions/Significance: n/aReflection: One potential improvement to this innovation would be to introduce the ANKI software towards the end of Year 1 in order to maximize its familiarity before Year 2 begins. In conclusion, the diffusion of Internet connectivity, mobile devices, and participatory media has cultivated a context for more networked learning1. Digital spaced-learning media offer students and medical educators an alternative means to address learning demands inherent to multiple education disciplines.References: 1. Ruiz, Mintzer, and Leipzig (2006), ‘The Impact of E-learning in Medical Education’, Academic Medicine, Vol 81 (3): 207-212. 2. West, Farmer, and Wolff, (1991) ‘Instructional Design: Implications from Cognitive Science.’, Boston, Allyn and Bacon. 3. ‘ANKI – Powerful, Intelligent Flashcards’, http://ankisrs.net.

Poster S-36: Scholarly concentration programs and medical student research productivity: a systematic review

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Purpose/Problem Statement: A growing number of medical schools have implemented scholarly concentration (SC) programs to promote student inquiry and independent research. 1 The nature of these programs is diverse, although most involve in-depth study beyond the core curriculum, faculty mentorship, a range of concentration areas to choose from, and a required outcome in the form of a scholarly paper or presentation. Given the high cost and administrative burden of SC program implementation, it is important to examine SC program efficacy. This systematic review examined the impact of SC programs on student research productivity.Methods/Approach: The authors carried out a literature search using PubMed, Scopus, Embase, Web of Science, and medical education journals through May 2015 to find articles related to SC program research productivity outcomes. Scholarly concentration programs were defined as (a) providing an in-depth scholarly experience beyond the conventional curriculum (b) requiring completion of a scholarly project and (c) extending for longer than a single summer. The inclusion criterion was examination of an SC program and a method of rigorously evaluating SC scholarly productivity.Results/Lessons learned: The initial search disclosed 4,095 papers; 103 were considered based on titles alone. Seven met the inclusion criteria: all were descriptive and low quality; none had a priori hypotheses that examined predictors of increased medical student research productivity in SC programs or prospectively evaluated the impact of SC programs on student scholarly output.Discussions and conclusions/Significance: More rigorous, hypothesis-driven studies are needed to determine how SC programs and specific characteristics of SC programs impact medical student research productivity. This study has several limitations. Productivity in terms of student publications and presentations is only one measure of medical student scholarly activity and SC program success; the study did not assess other potential measures of SC program success such as improved critical-thinking and analytical skills, career preparation, and student-faculty relationships. In addition, student research productivity may not manifest as presentations or publications until several years after graduation.Reflection: N/AReferences: 1. Schor NF, Troen P, Kanter SL, Levine AS. The Scholarly Project Initiative: Introducing scholarship in medicine through a longitudinal, mentored curriculum program. Acad Med. 2005;80:824–831.

Poster S-37: Training Pre-Clerkship Medical Students in Clinical Observation Skills with Art and Clinical Images: Evaluating Order of Intervention

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Purpose/Problem Statement: The importance of observation in physical diagnosis is well established. Several studies have indicated that medical students enjoy art observation training, and that these exercises positively influence skills of observation1,2,3. However, no definitive “best method” to train pre-clerkship medical students to be better observers has been identified. The purpose of this study was to determine whether clinical observation skills in pre-clerkship medical students are most enhanced by training with an art educator, training with a clinician educator, or a combination of both, and whether the order of training affects the outcome.Methods/Approach: This study was conducted over an academic year. Participants (n=33) were divided equally into three groups: Group A experienced 3 instructional sessions

with an art educator at our university art museum, followed by 3 sessions engaged with a physician who instructed using clinical images. Group B experienced the 3 sessions with the physician educator first, followed by 3 museum sessions with the art educator. Group C was a randomized control group and received no intervention. All participants completed three written narrative exercises describing clinical and art images at the start of the study (September), midway through the study (December), and at the conclusion of the study (March). Narrative responses were holistically graded on a 1-5 scale by two reviewers, using a standardized rubric developed for this project. Reviewer scores were averaged and analyzed using univariate ANCOVA. Participants in Groups A and B also evaluated the program.Results/Lessons learned: Univariate ANCOVA indicated that there were significant differences between Group A (art sessions followed by physician sessions) and Group C (control) on post-test clinical image scores in March. Group A's post-intervention scores (mean = 3.773) were significantly different from Group C's (mean = 3.273) after controlling for their pretest value ($F = 5.834$, $p = .026$). This difference was not shown to be significant between September and December. No significant difference was found between Group B alone (physician sessions followed by art sessions) compared to Group C (control). However, when post-intervention scores from both Groups A and B (mean = 3.631) were compared to control Group C, significant difference was found ($F = 5.050$, $p = 0.032$). The participants were enthusiastic about their participation in the program. For example one student wrote, "I liked how we focused purely on description and not on diagnosis. Just goes to show how medicine really is an art just as much as it is a science." From the art sessions one student commented, "I already feel like I think more systematically due to these sessions in terms of my observations." Overall students thought their clinical observation skills were improved through the training, "I think this will help more with how I relay my observations to my attending physician."Discussions and conclusions/Significance: This study reaffirms that art observation training can enhance clinical observation skills, and suggests that training is more effective when the art instruction precedes specific instruction in clinical observation; perhaps art observation training serves to prime" students to be better observers. This may also suggest that this intervention with art would be most effective early on in medical training. The development of a rubric for evaluating narratives that describe observations appears to be an important step in measuring the effect of a humanities program in medical education. Further refinement of our holistic rubric is needed. We intend to replicate this study with additional subjects and engage in further refinement of a holistic rubric for analyzing the acquisition of visual observation skills.Reflection: Our medical students enjoyed attending museum sessions and benefitted from them. The study suggests that visual arts training along with specific clinical training will be an effective training strategy.References: 1. Jasani SK, Saks NS. Utilizing visual art to enhance the clinical observation skills of medical students. Med Teach. 2013 Jul; 35(7):e1327-31. 2. Bardes CL, Gillers D, Herman AE. Learning to look: developing clinical observation skills at an art museum. Med Educ. 2001 Dec; 35(12):1157-61. 3. Dolev JC, Friedlaender LK, Braverman IM. Use of fine art to enhance visual diagnostic skills. JAMA. 2001 Sep 5; 286(9):1020-1. "

Poster S-38: Student Feedback on a Novel Peer and Self Assessment Program

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Purpose/Problem Statement: Giving and receiving feedback are essential to personal and professional development (Sargeant 2013). As there are few established opportunities to develop these skills during pre-clinical years, we sought to encourage constructive communication and self reflection among first and second year medical

students.Methods/Approach: A team of medical students across class years at Stony Brook University School of Medicine developed a peer and self assessment (PSA) program that was implemented in August 2014. The PSA student team collaborated with the medical school administration and informatics staff to embed the PSAs within the existing curriculum online database. First year students are introduced to PSA through an introductory presentation and guided practice assessments led by the PSA team during orientation. Thereafter, students are randomly assigned a team member to evaluate following group activities in preclinical courses. These groups are assigned upon entering medical school and comprise an anatomy group (4 students), a team-based learning (TBL) group (6 students), and a discussion group (12 students). Peer assessments are conducted monthly and self reflections conducted bimonthly throughout the preclinical years. Students meet twice a year with their faculty advisor to review the feedback they have given and received, as well as to discuss their self assessments. Now in the PSA program's second year, we will solicit feedback from first and second-year students regarding the value of the PSA program through an investigator-designed survey (22 Likert-scale questions). This survey was designed to collect data regarding student perception of feedback, self assessments, and meetings with their faculty. Responses from the Class of 2018 (N=102 or 79.7%) was collected in February 2015 and presented at the 2015 NEGEA conference. Preliminary results demonstrated a positive attitude toward the PSA program across several domains. Suggestions from this survey led to several changes that were incorporated into the PSA system during the 2015-2016 school year: PSA was limited to once per month and sub-questions were eliminated to reduce redundancy. Several additional questions specifically directed at the impact of peer and self assessment on the anatomy group experiences will be added to the survey where applicable.Results/Lessons learned: Small group activities such as TBL and anatomy dissection are optimal for feedback. Group activities must be sufficiently small and highly interactive to warrant PSA. Clearly informing students about the goals of the PSA program and expectations for each assessment is imperative. Adequate implementation, representation, and communication of a novel program are paramount for success. Challenges to a student-driven PSA program are rooted in the time constraints of medical students and faculty. The PSA team must be consistent in establishing dates for assessment, reminding students of upcoming feedback, and responding to student concerns. Additionally, collaboration with administration and faculty members is necessary to effectively coordinate assessments with the curriculum.Discussions and conclusions/Significance: In order to be effective, any peer assessment program requires an emphasis on constructive feedback and must be responsive to the needs of students (Arnold 2005, Nofziger 2010). Our student-driven program is highly responsive to student feedback and easily modifiable. Buy-in to our program is achieved through transparency as well as medical student leadership and responsibility. Our program also emphasizes an understanding of the goals of peer assessment through an initial training session and presentation. Our program is a sustainable and effective means of integrating PSA into preclinical medical education.Reflection: The PSA program will continue to be evaluated through student feedback. Beginning in Spring 2016, PSA will be integrated into clerkships. Students will evaluate classmates with whom they have had significant interaction.References: Sargeant J, Bruce D, Campbell CM. Practicing physicians' needs for assessment and feedback as part of professional development. J Contin Educ Health Prof. 2013;33 Suppl 1:S54-62. Arnold L, Shue CK, Kritt B, Ginsburg S, Stern DT. Medical students' views on peer assessment of professionalism. J Gen Intern Med. 2005;20(9):819-24. Nofziger AC, Naumburg EH, Davis BJ, Mooney CJ, Epstein RM. Impact of peer assessment on the professional development of medical students: a qualitative study. Acad Med. 2010;85(1):140-7.

Poster S-39: Academic Enrichment Programs: Offering Students Support Throughout the Medical School Years

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Purpose/Problem Statement: The Center for Academic Achievement (CAA) at the University of Massachusetts Medical School (UMMS) offers Academic Enrichment Programs (AEP) to support students throughout their education. Personnel offering AEP are committed to building a positive environment so students understand the value of seeking assistance to address the many demands of medical school. Those at the CAA are aware of the literature noting that: "Nearly 50 percent of medical students across all U.S. medical schools experience burnout … and the problem persists throughout physician training…. [Students] experience a high level of psychological distress, which can manifest in many different ways. For some [students], that means burnout. Others experience depression or have very high levels of fatigue'"1. "Each year roughly 300-400 U.S. physicians die by suicide… [The} suicide rate in male physicians is 40 percent higher than in the general male population and 130 percent higher among female physicians than in the general female population"2. AEP personnel believed that students were not making use of the center as much as would be desired and that if they attended more frequently over the years they would benefit. It was anticipated that the services offered at the CAA might help students feel less distressed since the skills taught may help them improve their performance. Services offered at the CAA include preparation for course and NMBE exams, development of skills associated with studying, test taking, time management, and organization, and consultation to address the ongoing demands of medical school. Students visit the CAA on a voluntary basis so in order to assist students changes were needed to encourage their participation.Methods/Approach: The AEP Director engaged in outreach to try to encourage students to make use of resources. Activities included presenting to classes and sharing information about services offered, increasing communication with students in a manner that displayed a commitment to their well-being, developing positive relationships early in the students' medical school career and sharing the variety of services offered over the years, improving communication with mentors, administrators, and course instructors to display the services offered and the feedback provided from students so that they would encourage other students to make use of services, modifying and sharing with students privacy policies so they were aware of communication practices at the CAA, and increased interaction with Student Counseling Services personnel about general student needs and with releases sharing essential information in service to students.Results/Lessons learned: Since implementing this outreach the CAA AEP have seen a significant increase in use of services over the past five years. There has been a dramatic increase in use for students enrolled in all years of medical school. Students are visiting the center for multiple years and some visit each year they are enrolled. These increases have occurred even though there has not been an increase in enrollment.Discussions and conclusions/Significance: Data show that students need support and will seek services if they are made aware of the opportunities for assistance and outreach will continue. Students who visited the CAA noted they feel respected, supported, that their concerns are understood. They stated that they implemented recommendations given, were able to apply the recommendation to situations beyond the initial concern, and that their interactions at the CAA positively impacted their performance.Reflection: The findings show that with outreach and systems that had no cost, changes were made that resulted in students

voluntarily seeking support and benefitting from services offered. It is hoped that these experiences in medical school will lead to less burnout, which is associated with “serious thoughts of dropping out” of medical school3 , and encourage students to seek assistance if they need support during residency and their professional careers.References: 1. Student SOS: 6 ways to avoid “distress” in medical school.American Medical Association Web site. http://www.ama-assn.org/ama/ama-wire/post/student-sos-7-ways-avoid-distress-medical-school Published May 15, 2015. Accessed November 18, 2015. 2. Stopping burnout a top priority for physicians in training.American Medical Association Web site. http://www.ama-assn.org/ama/ama-wire/post/stopping-burnout-top-priority-physicians-training?utm_source=Lyris&utm_medium=email&utm_term=111815&utm_content=I15Recap&utm_campaign=article_alert-Wire_Alert Published November 16, 2015. Accessed November 18, 2015. 3. Dyrbye, LN, Thomas, MR, Power, DV, et al.Burnout and Serious Thoughts of Dropping Out of Medical School: A Multi-Institutional Study.Academic Med. 2010; 85 (1): 94-102.

Poster S-40: Various Strategies Benefit Students Preparing for Step 1

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Purpose/Problem Statement: At the University of Massachusetts Medical School (UMMS) numerous second year students visit the Center for Academic Achievement (CAA) to participate in the Academic Enrichment Programs (AEP) offered to help support preparation for Step 1. Students come to the center with various levels of knowledge, numerous study systems, individual learning strategies, and several different experiences with previously completed standardized tests. Those assisting the students must have a plethora of systems to address individual student needs in order to help them succeed on this NBME exam.Methods/Approach: Students voluntarily make use of AEP and when participating desire to develop systems that will help them meet their goals. Those at the center have developed a variety of methods that are then tailored to the student’s needs. Some approaches offered include helping students develop: Daily calendars with specific activities listed Task lists which allow students to set their own daily agendas Monthly calendars including topics to study and practice test dates Active reading strategies utilized to gain from the material reviewed Study tools to address content learning and review Organization strategies Resource review and suggestions to address specific concerns Analysis of question responses to identify patterns Systems to approach questions and determine pacing plans Approaches to address the stress and nervousness related to the exam These approaches are supported in the educational literature. Strowd and Lambros share that developing Step 1 study schedules, reviewing resources, and planning self-assessments provided helpful guidance and also reduced student anxiety1. Guerrasio discusses the value of study schedules, active learning strategies, making study tools, incorporating questions into study routines, and addressing a lack of confidence when working with medical students2. In order to encourage use of the systems discussed, UMMS students receive a document after each session which includes the specific plans and strategies developed during the session. Therefore, students have specific reminders so that they can implement the numerous ideas presented.Results/Lessons learned: Students appreciate the services provided through the AEP. Since these approaches were implemented over the past few years, there has been a significant increase in the number of times second year students visit the CAA. Students rate the services they receive as part of their Step 1 preparation as very helpful and positively impacting their Step 1 performance. They note that their level of nervousness related to the exam was reduced. Additionally, they share that they would

recommend the Step 1 preparation services offered at UMMS to students' in future second year classes.Discussions and conclusions/Significance: Students preparing for Step 1 feel stress related to their ability to perform well. They desire to earn a score at a level high enough to help them obtain residency interviews, as well as lead to a placement in a desired specialty area or a preferred residency location. Students devote numerous hours preparing for Step 1 and spend a significant amount of money on resources they believe will lead to success on this exam. Ratings of services showed that students benefit from meetings specifically aimed at helping them prepare.Reflection: Students appreciate the individual attention provided by professionals trained in developing educational plans who are familiar with study, time management, and test taking skills. These findings motivate those working at the CAA to continue their efforts and support the existing literature related to the benefit of active learning strategies3.References: 1. Strowd, RE, Lambros, A. Impacting student anxiety for the USMLE Step 1 through process-oriented preparation. Med Educ Online, 2010 Feb 24;15. doi: 10.3402/meo.v15i0.4880. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2830045/ 2. Guerrasio, J. "She Needs to Read More": Helping Trainees Who Struggle with Medical Knowledge.In A. Kalet and C.L. Chou (eds.).Remediation in Medical Education: A Mid-Course Correction.New York: Springer Science+Business Media; 2014: 39-54. 3. McNamara, DS. Strategies to read and learn: overcoming learning by consumption.Med Educ, 2010; 44: 340-346.

Poster S-41: Analysis of progress report submission latency in the context of development of self-directed learning skills

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Purpose/Problem Statement: Scholarship courses are increasingly integrated into modern medical school curricula to enhance career guidance, focused mentoring, and development of skills of scholarship. The University of Massachusetts Medical School (UMMS) implemented the required Capstone Scholarship and Discovery (CSD) course in 2010. The course culminates in the written presentation of a longitudinal four-year project. With no formal curricular time in the first three years of school, students work largely independently with guidance from Learning Communities mentors and then Capstone project advisors. The timely submission of documentation, particularly involving self-directed career development, is a critical skill not usually associated with medical school curricula. The institution of a Capstone project is designed in part to develop such skills while encouraging self-directed scholarship that is essential to both non-medical doctorate programs and academic medicine. UMMS students complete scheduled progress reports and related submissions designed to guide and support their effort. These reports include generating draft components of the final project report. The purpose of this study is to: 1) identify latency patterns and trends in submission within and across student cohorts; 2) reveal programmatic causes for late submission; and 3) develop strategies to curb late submission of progress reports.Methods/Approach: Student reports are submitted online such that each is logged with date and time of submission. Submission compliance was calculated to compare latency of report completion within class cohorts, and to compare report type across the four class cohorts.Results/Lessons learned: We identified three broad trends in the timing of progress report submissions. 1. progress reports prior to the first comprehensive project proposal (due in the spring of the second year) were submitted after the deadline in approximately one-quarter to one-third of the class 2. the comprehensive project proposal was submitted after the deadline by nearly every student 3. the percentage of late progress report submissions that followed the comprehensive project proposal returned to the levels seen in the initial reports. One exception can be found in the Advisor Selection form, for which the inaugural Capstone cohort (Class of 2016) had a tardy submission rate of

93%Discussions and conclusions/Significance: In the early rollout of the Capstone course, a substantial minority of the students submitted progress reports after deadlines, and essentially all students from the first two classes submitted their comprehensive project proposal after the deadline. Possible causes for these delays include student issues (competing responsibilities, lack of progress in project development, discomfort with project management, anxiety regarding meeting self-expectations); course issues (lack of clarity regarding expectations, difficulty of completing independent work without dedicated course time); cultural issues (students accepting a new course with a very different format than others) Course leaders seek to better understand the reasons for delayed submissions through incorporation of improvement based on student feedback, ongoing tracking to determine changes in submission timing longitudinally, and participation in national groups with similar efforts. We posit that improvement in submission rates will take place as course support meets student needs particularly regarding the value of “process over results” in keeping with the exploratory and professional development structure of the project. Further outreach activities that extend to the student body is essential. Potential limitations to our study include a lack of comparison programs. An additional source of delayed submissions from our cohort might be that medical students bring a wide range of scholarly writing experience to the course.

Poster S-42: Developing the professionalism of medical students through the lenses of leadership, health systems and values-based patient centered care

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Purpose/Problem Statement: Physicians are highly educated professionals, who begin their professionalization at the commencement of medical school. Professionalism for physicians includes an understanding of the role as leader, in addition to the role of clinician. With an increasing focus on physicians as leaders, how can medical schools cultivate physician leaders from the start of their medical training?Methods/Approach: The USF-MCOM; Tampa, Florida and LVHN; Allentown, Pennsylvania jointly created the SELECT Program providing students with a holistic education in the domains of health systems, leadership, and values-based patient-centered care, in addition to the traditional core curriculum. The program is steeped in emotional intelligence, which has been often cited as a key to leadership development and effectiveness [i] The four-year, longitudinal curriculum is delivered through a “Professional Development” course, in which groups of students are assigned to professional development cohorts led by physician faculty coaches. Students and faculty coaches work together to assimilate the leadership competencies. Students are professionalized as physicians with a focus on their individual development, which may provide for a higher level of effectiveness as physicians and future leaders.Results/Lessons learned: Now in the fifth year of existence, the importance of faculty development for the coaches has emerged as well as the importance of a strategic, seamless curriculum across 4 years and 2 campuses. Another consideration is delivering interactive and engaging content with an experiential element, using actual cases and exercises, including small group interaction with coaches. In the past, the curriculum was delivered in more of a traditional lecture based format, with less small group time. The new format, with increased time for thoughtful interaction in small groups, as well as case-based instruction, has lead to more student interaction and meaningful discussion.Discussions and conclusions/Significance: -Reflection: As we continue to collect data on program outcomes in the areas of emotional and social competence, health systems understanding and competency in values-based patient-centered interactions, the program has potential to be a model of best practices in increasing medical students’ exposure to areas outside of the traditional medical

school curriculum. Leadership development is becoming more prevalent in medical education, and as this is still an emerging area of study, results from this program may also inform the literature on physician leadership development and provide insights into developmental and educational opportunities for residents and beyond.References: [i] Goleman, D., Boyatzis, R., & McKee, A. (2013). Primal leadership: Unleashing the power of emotional intelligence. Harvard Business Press.

Poster S-43: Everyday Mindfulness: a Video-based Mindfulness Counselor for Patients in Primary Care.

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Purpose/Problem Statement: Video-based educational tools have been validated as practical and efficient methods of counseling1. Interestingly, educational and behavioral counseling, when communicated in the form of video, is equally and in some cases more effective than traditional in-person methods2. Mindfulness has various positive benefits in a wide range of patients: anxiety, cancer, hypertension, schizophrenia, and depression3. Put briefly, mindfulness is having a cognitive state of open attention to the present moment. Although physicians can prescribe mindfulness exercises to their patients, time constraints often prevent them from fully explaining the concept and techniques of mindfulness. Patients who might otherwise benefit from mindfulness are left unfamiliar with the tangible 'how-to' aspects of its practice and remain hesitant to give it space in their daily routine. To address this, we created a video-based counseling program that includes information about mindfulness, addresses common barriers and concerns about mindfulness, and incorporates practical and easy mindfulness exercises to help primary care patients sustainably integrate these activities into their daily lives.Methods/Approach: An initial round of focus groups gathered information on which media types (e.g., smart phone apps, YouTube videos…etc.) and what content appealed to or dissuaded our target primary care demographic. Data generated helped guide the development of the video-based counselor, which was also influenced by the Stages of Change (SOC) theory. This model holds that individuals progress through a continuum of stages when making decisions to change behaviors, namely: pre-contemplation, contemplation, preparation, action, and maintenance. Our videos were tailored for individuals in the pre-contemplation and contemplation stages to foster interest in the health benefits of mindfulness and encourage a transition to the preparation and action phases. Actors, associated with Hartford Stage in Connecticut, were recruited and five videos were produced for the video-based counselor program; each around two minutes in length. Housed in a stand-alone website, they form a progressive series. Video #1 is an introduction to the basics of mindfulness (i.e., its benefits, experiential anecdotes, and a simple short exercise). Videos #2-5 walk patients through other exercises, while emphasizing that mindfulness is a highly individualized activity, and therefore, it is important to attempt a variety of different exercises until one is found that fits.Results/Lessons learned: Participants of the focus group highlighted the importance of emphasizing the individuality of mindfulness and showcasing a diverse array of mindfulness exercises in the videos. They also believed it important to make clear that difficulty with mindfulness exercises is part of the success; reiterating this theme throughout the videos is expected to help beginners channel their possible initial frustrations and accept this struggle as part of the process of creating a successful mindfulness routine.Discussions and conclusions/Significance: n/aReflection: Limitations of our study revolve around technology; older patients may not be as comfortable with computers and internet-based media. Next steps include evaluating these videos in a primary care clinic setting by having willing patients watch introductory video #1 during a clinic visit and emailing them the follow-up videos. We can then evaluate if our video-

based counselor effectively encouraged patients to start and maintain a mindfulness routine. We have created a patient-friendly video-based counselor that is hypothesized to be an effective mechanism to onboard and sustain mindfulness in a naïve primary care population.References: 1. Calderon Y, Haughey M, Bijur PE, et al. An educational HIV pretest counseling video program for off-hours testing in the emergency department. Ann Emerg Med. 2006;48(1):21-7. 2. Calderon Y, Cowan E, Nickerson J, et al. Educational effectiveness of an HIV pretest video for adolescents: a randomized controlled trial. Pediatrics. 2011;127(5):911-6. 3. Gotink RA, Chu P, Busschbach JJ, Benson H, Fricchione GL, Hunink MG. Standardised Mindfulness-Based Interventions in Healthcare: An Overview of Systematic Reviews and Meta-Analyses of RCTs. PLoS ONE. 2015;10(4):e0124344.

Poster S-44: Improving clinical-pathologic correlations in preclinical education through interactive cinematic microscopy modules

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Purpose/Problem Statement: Knowledge of how fundamental disease mechanisms manifest in diseases of organ systems is paramount to undergraduate medical education. To this end, well-taught structure-function relationships can solidify links between seemingly abstract concepts of cellular or tissue dysfunction and clinical presentations. Furthermore, the need to understand these links between the pathologic and clinical aspects of disease is one that is reinforced in many medical and surgical subspecialties throughout a practitioner's career, through biopsy reviews, CPCs (clinical-pathologic case conferences), and tumor boards. There are some limitations to learning these relationships using static digital images, including the loss of perspective of magnification, scale, and comparison of pathologic tissue to adjacent normal tissue. The purpose of this project was to develop a series of digital video-based “cinematic microscopy modules in an attempt to better consolidate structure-function relationships of foundational disease processes in preclinical education.Methods/Approach: Representative cases from the case archives from the Department of Pathology at the University of Massachusetts Medical School and the UMass Memorial Medical Center were identified for particularly instructional disease processes for first and second year-level medical students. Because the intended emphasis was on structure-function relationships and not merely microscopic findings, each case was presented in the context of the actual patient presentation and laboratory or radiologic data, to best simulate the diagnostic workup of actual patients at the time of presentation, and to simulate the experience of sitting with a pathologist for a “guided tour” at a multi-headed or projected microscope, just as in every day clinical care. The design for each of these modules was intended to be pedagogically consistent and accepting of various student learning styles. Through short (2-4 minute) guided video tours of the microscopic findings of patient specimens, students were offered a self-paced, learner-centered format to learning key pathology content appropriate for their curricular level, developing a substrate of disease fundamentals. These tutorials also have the potential to increase retention of crucial material for board examinations and to increase fluency of trainees in pathologic methods and terms. Cases were chosen from various organ systems and diseases to produce annotated modules. A light microscope with an attached high-definition video camera was used for capture of video files, which were overlaid with explanatory audio commentary. The files were also annotated with text and icons to further highlight key structural features of the disease process. The complete module was compiled on Adobe Presenter and was designed to include different learning styles in order to accommodate as many students as possible as well as give students a greater exposure to histology. Since students learn in diverse ways, it was important to

include different learning styles into the modules with the hope of making these modules as effective as possible. For those employing textbooks in their study of the material, resources were included in the background reading section of the module. For visual learners and those who learn best from listening to the material, 2-4 minute videos with voiceovers were designed for each pathological condition. Consolidation exercises were developed using still images from the glass slide on which the audiovisual was based upon to test knowledge of histopathology and correlative pathophysiologic mechanisms. More traditional consolidation exercises were also formed, such as multiple choice questions related to the disease depicted on the glass slide.Results/Lessons learned: Pilot offerings of video modules (initially confined to kidney diseases) were well received by student users, although only a few students voluntarily used the modules. Early feedback indicates improved usage when the modules were tied to consolidation exercises.Discussions and conclusions/Significance: Students often prefer self-directed learning with video and interactive self-assessments, and these cinematic microscopy modules are unique updates of the traditional approach to teaching this material. These modules should help solidify structure-function content presented in undergraduate medical education, while feasibly emulating for medical students the experience of viewing real-time cases under the guidance of a pathologist at a multi-headed microscope, the cornerstone learning method of structure-function relationships for trainees in pathology.Reflection: In the future, we hope to develop more modules for different organ systems to give students more resources that they can use as an adjunct to the current curriculum. We hope to systematically gain quantifiable student feedback to optimize future modules in order to best help students solidify these foundational disease mechanisms.References: 1. Freeman S, et al. "Active learning increases student performance in science, engineering, and mathematics." Proc Natl Acad Sci U S A. 2014; 111: 8410. 2. Bitran M, et al. "Medical students' change in learning styles during the course of the undergraduate program: from 'thinking and watching' to 'thinking and doing.'" Can Med Educ J. 2012; 3: e86. "

Poster S-45: Community Perspectives in Medicine: Elective for First-Year Medical Students

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Purpose/Problem Statement: Over the past, our nation has been gripped by stories depicting social injustices and inequities. This has led, in part, to protest and other demonstrations of student activism. In response to recent current events, we developed a student-initiated and student-run elective, Community Perspectives in Medicine (CPIM), that provides a unique forum for first year medical students to interact and have open discussions with communities that are most impacted social and health inequities.Methods/Approach: Forty first-year students indicated interest in CPIM; 15 were registered on a first-come, first-served basis. During five consecutive two-hour sessions, representatives of different community-based organizations (CBOs) speak with 15 first-year medical students. Invited CBOs represent various diverse populations, including LGBT, chronic illness, disabilities, religion, and immigrant health. For the first hour of each session, a second-year student facilitates a semi-structured interview of the CBO guests focusing on the chief health disparities within their community, challenges experienced with the medical system, and suggested improvements for medical practitioners. Students are encouraged to ask additional questions, often resulting in a rich dialogue. The second part of the session is a debriefing by the student facilitator over a relaxed dinner (sans CBO guests). Students and speakers complete an evaluation after each session, and students are also asked to write three take-home points. Students also complete a final evaluation at the end of the elective, and the Medical Attitudes Toward the Underserved survey (Crandall et al.) before and after the elective.Results/Lessons learned: Early into the elective, we realized we

needed to provide students with pre-reading materials (suggested by the moderator or CBO) to enrich the discussion. A 10-minute wrap-up was also added at the end of each debriefing to provide continuity across the sessions. We hope to create additional sessions for second-year medical students to help prepare them immediately before they begin their clerkships in the second half of their second year. In these additional sessions, we hope to hear best practices from physicians working for community health centers. A physician from the WCMC community would help moderate the sessions and the debriefings.Discussions and conclusions/Significance: Like some programs (e.g., UNC-Chapel Hill's Community-Based Participatory Research program), we emphasize the importance of a partnership between CBOs and medical students; in this way, not only are we increasing medical students' cultural awareness, but also providing traditionally disenfranchised communities with a formal involvement in medical education (Cene et al). Second, we demonstrate how student-developed and student-led courses can be integrated into medical education, and can provide students with meaningful involvement with CBOs outside of service-based learning models. Lastly, our project used a unique format of safe-space discussion forums and session debriefings to enhance critical thinking, similar to a model used at the San Francisco Veterans Affairs Medical Center during their Longitudinal Rotations program (Chou et al). We hope our program can be an easily adaptable model for other medical schools to increase community perspectives in medical education.Reflection: n/aReferences: CW Cene et al, Community-Based Teaching about Health Disparities: Combining Education, Scholarship, and Community Service, Journal of Gen Internal Med 25 (2009): 130-135. CL Chou et al, A Safe Space" For Learning and Reflection: One School's Design for Continuity with a Peer Group Across Clinical Clerkships, Acad Med 86 (2011): 1560-1565. SJS Crandall et al, Medical Students' Attitudes Towards Underserved: A Longitudinal Comparison of Problem-Based and Traditional Medical Curricula, Advances in Health Sciences Education 12 (2007): 71-86. "

Poster S-46: Evaluation of Small Group Discussions in Medical School Ethics Education

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Purpose/Problem Statement: Over the last 30 years, the degree of integration of ethics education into medical school curricula has varied widely. While the Liaison Committee on Medical Education (LCME) requires United States medical schools to teach medical ethics, there is no unified instructional method (Carrese 2015). In particular, the role of the small group dynamic in medical ethics education has not been explored. Here, we evaluate the effectiveness of the teaching methods utilized in Medicine in Contemporary Society (MCS), the medical ethics course taught to first and second-year medical students at Stony Brook University School of Medicine (SBUSOM). Our study will focus on evaluating the effectiveness of small group discussions as an instructional tool.Methods/Approach: MCS is an 18-month longitudinal course that meets twice per month. Each session consists of a 1-hour class-wide lecture followed by a 1-hour small group discussion. The small group component consists of 11 or 12 students and two faculty preceptors per group. Each session is devoted to a specific ethical or social issue in medicine. Students are assigned reading prior to each session and occasional written assignments including narrative and persuasive writing and self-assessments. While faculty preceptors help guide the discussions, the small groups are student-led with a designated student leader for each small group meeting. Students receive a grade of Pass or Fail upon completion of the course. Currently, student feedback for MCS is limited to a required course evaluation survey established by SBUSOM. In our study, students will be prompted to evaluate their learning experience at the conclusion of the course through

questions on group collaboration, contribution to discussion, personal development, and areas for improvement. Students will also evaluate the relevance of the selected MCS topics with an emphasis on self-reflection. The survey will consist of both Likert Scale and open-ended questions (see Appendix). Descriptive statistics including averages and frequencies will be conducted with IBM SPSS software. Chi-square tests will be used to calculate differences between groups. Student open-ended comments will be thematically categorized and integrated with the quantitative findings to illustrate, elaborate, and qualify specific aspects of student perceptions.Results/Lessons learned: The small group discussions incorporated into the MCS course at SBUSOM facilitate a high level of interaction among group members. Small group interaction is intended for students to think analytically and critically through difficult ethical scenarios. Students benefit significantly from experienced faculty preceptors who help guide the small group discussions.Discussions and conclusions/Significance: The U.S. medical ethics curriculum is highly variable between medical schools, rendering it difficult to assess students' understanding of complex ethical dilemmas in contemporary medicine (Carrese 2015). To that end, it is important to identify the components of an ethics course that students render most meaningful. Through an investigator-developed survey, we will explore the role of small group discussions as an effective instructional tool. Our study will also provide perspective on the impact of MCS on career and personal development. The data will be utilized to identify potential criteria for a unified medical ethics curriculum and implement educational reform where needed.Reflection: Once the data is collected, a subsequent Likert Scale survey will be administered to assess the quality, clarity, and relevance of the questions asked in the survey on the MCS course. Students will also be able to elaborate further about ethics education at SBUSOM through an open-ended question. Suggestions will be incorporated into subsequent assessment strategies for the MCS course in order to improve evaluation of ethics education in medical school.References: Carrese JA, Malek J, Watson K, et al. The essential role of medical ethics education in achieving professionalism: the Romanell report. Acad Med. 2015; 90(6): 744-52.

Poster S-47: Interactivity and First-Person Point of View Videography in Teaching the Physical Exam

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Purpose/Problem Statement: Physical exam instruction is a major component of the clinical skills taught in the first two years of medical school. Traditionally, students read textbooks and then practiced on each other, standardized patients or real patients, under the direct observation of faculty. Together with the medical history and laboratory investigation, the physical exam is instrumental in increasing physicians' confidence in their correct diagnoses1,2. Various physical exam videos have been produced and shown to positively impact medical student education. Despite recent advances, most of these 'first generation' physical exam videos are from the perspective of a third party observer and lack interactivity. They also fail to take full advantage of available video and media technology. In an effort to improve patient outcomes, along with decreasing unnecessary testing and health care costs, teaching the physical exam has become of renewed importance in medical school curricula and medical students report a desire for an interactive element to be incorporated into this learning exercise3.Methods/Approach: We created and piloted the use of 'second generation' physical exam videos that include clips from the first-person or examiner perspective. We also added an interactive media component to the instructional videos. At present, 8 videos have been produced that cover the following sections of the physical exam: neurology (5), cardiac (1), pulmonary (1), and abdominal (1); with the remaining sections in development. The videos

incorporate first-person point of view footage filmed with a Go-Pro Hero3+ high-definition camera. Point of view is the perspective from which a piece of work communicates. Third-person point of view conveys an observer's perspective; whereas first-person refers to the perspective of the protagonist, whom the audience is intended to identify with (i.e., the physician in this context). The Go-Pro camera is designed for filming panoramic, cinema-grade digital action while being immersed in it. Overlying text and illustrations were added to help clarify important concepts. Accompanying interactive animations (i.e., sketches of the human body that respond to user actions and provide real-time feedback) and quizzes that reinforce and provide clarification of important concepts in regard to individual physical examination skills have been incorporated into the neurology module, with the remainder still in development. Adobe Premiere, Edge, and Muse software were used for video, animation/illustration/quiz, and website production respectively.Results/Lessons learned: Student interactions with the animations and quizzes encouraged active engagement with the material and self-reflection regarding knowledge or skill gaps. The first-person perspective allowed students to visualize themselves from the examiner's viewpoint, rather than that of a third-party observer not directly involved in the physician-patient interaction. This, combined with the interactive components, has facilitated an easier, more confident transition to students performing the neurological physical exam on their own. We hypothesize a similar outcome for the remaining sections still in development.Discussions and conclusions/Significance: n/aReflection: Limitations include this project being a work-in-progress without the entire body of educational modules being yet completed. Continued, planned development will address this. One improvement to this innovation would be to create a mobile version, which will improve both accessibility and convenience. The expected significance of this educational resource is directed towards increased knowledge and competence of 1st and 2nd year medical students with regard to the bedside physical examination, and subsequent future improvements to patient outcomes and health care costs.References: 1. Peterson MC, Holbrook JH, Von Hales D, Smith NL, and Staker LV (1992), 'Contributions of the history, physical examination, and laboratory investigation in making medical diagnoses', West J Med. 156(2):163-165. 2. Verghese A, Brady E, Kapur CC, and Horwitz RI (2011), 'The bedside evaluation: ritual and reason', Ann Intern Med. 155(8):550-3. 3. Jang HW and Kim KJ (2014), 'Use of online clinical videos for clinical skills training for medical students: benefits and challenges', BMC Med Educ. 14:56.

Poster S-48: Approaches to instigate interest in nutrition in the pre-clinical years

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Purpose/Problem Statement: Several reports have accentuated the need for improving the nutrition training of health professionals which will help them in providing optimal patient care (1-2). Being a new medical school, the curriculum at Cooper School of Rowan University is evolving and nutrition was identified as an area that needed further improvement.Methods/Approach: Our goal was to increase competency in nutrition and instigate interest in nutrition among second year medical students. One approach involved creating an interactive session that demonstrated clinical relevance of nutrition using real-life cases. The underlying nutrient deficiencies were not immediately apparent and required in-depth analysis of the data and 'out-of-the-box' thinking to come up with the correct diagnosis. Students worked in groups of four. Each student received one-and-half page document describing a case based on nutrition pathology along with underlying cause including the basic science concepts, treatment options, questions for discussion and conclusions. After reading the materials, each student presented the case to the group and led a thought-provoking

discussion using the hints provided in the document. They took pre and post quizzes as a group. Both quizzes included fact-based and comprehension-based questions. The second approach involved giving the students “one-a-day”, USMLE-style, thought-provoking nutrition questions throughout the four-weeks-long gastroenterology course to maintain perpetual thinking about nutrition.Results/Lessons learned: The students’ evaluations of the interactive session were overwhelmingly positive (Figure 1). The main aspects liked by the students were (i) engaging, intriguing and factual nature of the cases, (ii) peer-interaction; (iii) time efficiency and (iv) logical thinking. The competency assessment demonstrated that the session was extremely effective (Figure 1). This session can be further improved by asking the students to write a post-session reflection narrative. The students also highly valued the USMLE-type daily nutrition questions. These questions led to daily discussions about nutrition among the students.Discussions and conclusions/Significance: These activities made the students cognizant about their own nutrition. Some students are now creating nutrition-based activities in their community service programs. The integrated and higher order nature of the one-a-day questions made the students appreciate the complex nature of nutrition. Such approaches will be useful to instigate interest in nutrition among health profession students.Reflection: NAReferences: 1. Adams, K.M.; Kohlmeier, M.; Zeisel, S.H. Acad. Med. 2010, 85, 1537-1542. 2. Kris-Etherton, P.M.; Akabas, S.R.; Bales, C.W.; Bistrian, B.; Braun, L.; Edwards, M.S.; Laur, C.; Lenders, C.M.; Levy, M.D.; Palmer, C.A. et al. Am. J. Clin. Nutr. 2014, 99, 1153S-1166S.

Poster S-49: Developing a Transgender/Gender Identity Curriculum for Medical Students-Boston University School of Medicine’s Experience

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Problem Statement: Transgender patients suffer health care disparities[1]. In part, those health care disparities reflect societal stigmatization/prejudice and in part a lack of education/training in medical schools/residencies[1]. There are also specific barriers to care and medical interventions for transgender and gender nonconforming individuals which need to be addressed in medical training[2,3]. To address these gaps, our school is educating the next generation of physicians on transgender care and health issues[1]. Our approach is guided partly by the AAMC’s 2014 recommendations:

- “Sensitively and effectively eliciting relevant information about sex and gender identity from all patients in an appropriate manner.”
- “Perform a complete and accurate physical exam with sensitivity; knowing when portions of the exam are essential and when they may be unnecessarily traumatizing (i.e. repeated genital exams)”
- “Increase health care professionals’ awareness and knowledge of health [needs] of LGBT and gender nonconforming individuals, and individuals born with differences of sex development.”
- (AAMC, 2014. “Implementing Curricular and Institutional Climate Changes to Improve Health Care for Individuals Who Are LGBT, Gender Nonconforming, or Born with DSD.”)

Approach: Boston University School of Medicine has implemented a novel and progressive LGBT curriculum, which includes transgender care, throughout its four-year curriculum. In first year, the Integrated Problems Course features a case of a lesbian patient struggling with her sexuality. In this setting, the faculty supervisor assists the student, reinforcing respect of LGBT patients and discussing health care issues specific to the case for this patient. In Introduction to Clinical Medicine, an online module and

quiz reviews gender identity terminology and how to interview transgender, gender-nonconforming, and intersex patients. In Physiology, a faculty member teaches the current, evidence-based understanding of the biology of gender identity. Finally, in the Human Behavior in Medicine Course, there is a lecture on "LGBT Healthcare Disparities". In the second year curriculum, there is a lecture in Endocrinology devoted to specific medical issues and treatment strategies for transgender and intersex patients. In Psychiatry, a lecture focuses on the mental health needs of transgender people, followed by a panel of transgender patients who relate how their medical and mental health needs are and are not met by the medical system. The third year Clerkships deal with various aspects of LGBT issues such as, in the Pediatric Clerkship, helping young patients and their parents deal supportively with coming out as LGBT. Finally in the fourth year, there is the Transgender Medicine Elective. In the Transgender Elective students spend time in endocrinology, primary care, surgery, and adolescent medicine clinics sharing in the care of transgender individuals in varying stages of transition across the age spectrum. As well, students experience a support group, observe surgical practice, and participate in self-study on topics of the students' choosing.

Lessons Learned: Feedback from medical students has been generally very positive, and studies of individual curricular elements have also demonstrated a favorable impact on student attitudes and knowledge. For example, in a study of the impact of the transgender medicine content in Endocrinology students reported a 67% drop in discomfort providing care for transgender patients subsequent to the teaching unit ($P<.001$) [2]. During the process of developing the online module for Introduction to Clinical Medicine, a focus group of transgender women patients provided advice for future physicians. Participants raised several key issues, but prominent among their concerns were prior experiences of blatant transphobia and discriminatory treatment by healthcare providers. Respect and sensitivity alone are insufficient for transgender individuals, but our experience with curricular reform has taught us that student comfort providing care to transgender patients is both amenable to curricular intervention and important to patients. We hope to continue learning from our experiences and from the experiences of our patients and community members.

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Poster S-50: Leadership in Medical Education: Who, What, When, Where and Why

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References: -Session Outline (90 minutes): Strategies: The session will involve audience participation. Audience members will be asked to “use a common tool” to categorize what their schools are doing in the realm of leadership development for various learner groups Table discussions will focus on various aspects of leadership development: the who, what, when, where and why of medical education. The large group will discuss models for potential future collaboration in further identifying and disseminating best practices and collectively working on enhancements in one or more curricular aspect Session plan: Introduction: 7 minutes Ultrashort didactics: 27 minutes Each of 4 speakers will use max of 4 slides to provide a basic overview/highlights of their program in 6 minutes or less. Small groups: 36 minutes The group will break up into tables for facilitated small group discussion allowing a deeper into specific topics such as curriculum, coaching, assessment, admissions, recruitment and development of faculty development and support. Each participant can visit 2 tables each for 15 minutes (2-3 minute break to locate tables) Large group: 20 minutes Debrief from table discussions and discussion of future collaborationLearning Objectives: Session objectives: Analyze the who, what, when, where and why of leadership education in medicine- Who is receiving the instruction and who is delivering the content? What is leadership and what is the necessary content? When does the “learning” occur in the curriculum? Where are the students/learners receiving this instruction (within the medical school or from other departments or organizations), and Why is it important to include leadership education? Compare models for leadership development in medical education. Contrast promising practices for curriculum, content delivery, individual learner and programmatic assessment, feasibility, sustainability, and cost effectiveness. Identify strategies to integrate unique aspects of program content into one another’s programs. Plan cross-institutional collaboration to strengthen leadership development.Methods/Approach: Description of the issue/topic and rationale: Change in healthcare is ubiquitous and physician leadership is needed now more than ever (1). As we learn more about how physician leaders can positively influence patient outcomes and healthcare delivery, it is also important to understand how to help develop and sustain effective leaders across the continuum of medical education. This is an international as well as US concern (2)(3). Medical schools are beginning to explicitly include aspects of leadership development within the medical student curriculum to varying degrees (4). Graduate medical education, when it does provide leadership training, frequently focuses on skill building for “chief residents” or subsets of residents by specialty (5), a specific task, such as quality improvement (6), prior degrees (7) or as one of several “interests” (8). Academic health centers and health systems are finding it advantageous to deliberately engage subsets of faculty, rather than depend on what chancellor has called, “accidental leaders” (9)(10). Often this is done without an adequate needs assessment (11), understanding of underlying attitudes (12)(13) and opportunities for faculty development (14). Once created there is often limited sharing of content and lessons learned. (15)(16). This session, sponsored by the new special interest group in Innovation and Leadership will engage participants in understanding the strategies medical schools are using to assess needs, provide leadership development to their students, residents and faculty, measure outcome and impact and nurture emerging leaders.

Poster S-51: Exercise, Sleep, and Stress in Pre-clerkship Medical School Students

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Purpose/Problem Statement: Medical school students experience a significant amount of stress that can impact personal lives and professional performance1. It is probable that medical students get fewer than optimal hours of sleep, especially when preparing for exams. They therefore experience more daytime sleepiness compared to their age-matched peers1, with

implications for academic performance. Research has demonstrated that exercise reduces stress levels across different age groups and genders2. The American Heart Association (AHA) recommends that healthy adults exercise weekly to achieve at least 150 minutes of moderate or 90 minutes of vigorous aerobic activity and 2 days of strengthening the major muscle groups. The National Sleep Foundation recommends 7-9 hours of sleep for adults. However, little is known specifically about exercise and sleep patterns of medical students. The purpose of this study was to investigate exercise and sleep patterns in pre-clerkship medical students, and their relationship to stress and stress management.Methods/Approach: Two paper surveys were distributed to 270 first & second year students following attendance at a mandatory class. The researcher-developed survey included questions about amount & type of exercise in which students engaged (exam & non-exam weeks), factors that limited exercise, perceived levels of stress (5-point Likert scale: extremely stressed…not at all stressed), & sleep habits. A second survey, Epworth Sleepiness Scale, measured "daytime sleepiness." Both quantitative and qualitative analyses were used to determine importance of exercise, factors that encourage or limit exercise, types and patterns of exercise, and stress patterns and stress management.Results/Lessons learned: Surveys were completed by 223 (89%) of participants (M1=104, 84%; M2=119, 94%). 91% of respondents indicated that exercise was "extremely," "very," or "moderately" important, and 84% met AHA exercise recommendations. A student commented that exercise "is a daily routine, it improves focus, & is essential for staying physically and mentally healthy." Factors reported that limited exercise included lack of time or energy, injuries, and not enjoying exercise. (Lack of time was the primary limiting factor.) Students reported more stress during exam weeks than non-exam weeks. Almost all medical students reported academics as a source of stress, but half identified peers and family. Exercise was the most common method of stress relief, followed closely by sleep and social activities. 39% of participants reported sleeping fewer hours per night than recommended by the National Sleep Foundation, and 26% of students reported greater daytime sleepiness than what is normed on the Epworth Sleepiness Scale.Discussions and conclusions/Significance: The majority of medical student participants were aware of the importance of exercise, & many met AHA recommendations. Nevertheless, they experienced significant levels of stress, reduced sleep hours, and increased daytime sleepiness. The Liaison Committee on Medical Education (LCME) Accreditation Standard MS-26 mandates that all medical schools offer student wellness programs. However, no guidelines or standardization for these programs exist. Students must be aware of the importance of maintaining exercise levels recommended by the AHA, and also encouraged to increase sleep hours, and to identify/embrace sources of stress management. These measures are likely to improve quality of student life, and to educate future physicians about health and wellness. Limitations of this study are that students were surveyed at only one medical school and they had limited time to complete the surveys, which may have decreased reflection and accuracy. Finally, the Epworth Sleepiness Scale was designed for general use. An adapted version for medical students could be created and used for self- reflection leading to healthier lifestyles.Reflection: Further education is needed to encourage students 1) to engage in exercise levels recommended by the AHA, 2) to increase their daily hours of sleep, and 3) to identify and embrace sources of stress relief. These measures will not only improve quality of life in medical school, but will help to create healthier, happier future physicians who practice the preventative techniques they will be teaching their patients.References: 1) Dyrbye LN, Shanafelt TD. (2011, July) Commentary: Medical Student Distress: A Call to Action. Academic Medicine. 86(7): 801-803. 2) Scully D, Kremer J, Meade, MM, Graham R, Dudgeon K. (1998) Physical exercise and psychological well-being: A critical review. BJSM. 32: 111–120. 3) Johns MW. (1991) A new method for measuring daytime sleepiness: The Epworth Sleepiness Scale. Sleep. 14(6): 540-5.

Poster S-52: Improving diagnostic skills in medical students using diagnostic clusters

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Purpose/Problem Statement: Difficulty with diagnostic reasoning has been observed at our institution and others when students are asked to apply physical examination maneuvers to clinical cases (Wilkerson & Lee 2003). The Core + Clusters model has been introduced as a meaningful way to teach medical students clinical skills and diagnostic reasoning earlier than the clerkship years (Gowda et al. 2014). However, there is no evidence to our knowledge regarding the efficacy of diagnostic clusters or if students find them to be helpful. The purpose of this study was to investigate the impact of diagnostic clusters on medical student performance in history, physical examination, interpersonal skills, and clinical reasoning during a clinical skills assessment with standardized patients and to assess student preferences for learning clinical reasoning.Methods/Approach: All second-year University of Connecticut (UConn) medical students participated in the traditional in-class orthopedic curriculum in September 2014. In October and November, students participated in a 3-case formative skills assessment with standardized patients. Prior to the assessment, all students were informed that a shoulder pain case would be included. The shoulder pain diagnostic cluster tutorial was adapted for use in a Microsoft PowerPoint presentation that included links to physical examination videos .The control group did not receive the shoulder pain diagnostic cluster tutorial. The experimental group was instructed to view the tutorial prior to their clinical skills session. All students received a follow-up survey that assessed their preparation and resources used prior to clinical skills, preferences for learning, and feedback regarding the clinical skills session and the tutorial if applicable. The materials and resources needed for implementation of the diagnostic cluster tutorial include the following: diagnostic cluster tutorial, standardized case, standardized patients, facility for clinical assessment.Results/Lessons learned: Of the 95 students, 91 (96%) participated in the clinical skills performance analysis A total of 89 (94%) students participated in the survey. Students who viewed the diagnostic cluster tutorial (n=32) performed significantly better, compared to students who prepared using traditional curriculum alone (n=57), on review of systems ($p < 0.001$), special shoulder tests ($p = 0.01$), maneuvers for referred pain ($p = 0.001$), and forming a differential diagnosis ($p = 0.02$). There was no significant difference between the two groups in interpersonal skills or other components of the history, physical examination, and clinical reasoning skills ($p > 0.05$). The majority of students preferred online tutorials over independent learning and would like more diagnostic clusters to be incorporated into the curricula in the future. The students identified the differential diagnosis algorithm and physical exam videos as the most useful components of the diagnostic cluster tutorial.Discussions and conclusions/Significance: The diagnostic shoulder cluster tutorial improved student history, physical examination, and diagnostic reasoning performance on a standardized patient assessment. Limitations include that the study was conducted at only one university and the thoroughness of the experimental group's review of the tutorials was not assessed. Based on these study results, we recommend the following schedule for implementation of a diagnostic cluster tutorial in a pre-clerkship clinical skills curriculum: 1) students view the tutorial independently prior to classroom session; 2) use classroom time to clarify questions and practice physical exam technique under supervision; 3) review the tutorial prior to clinical skills assessment with standardized patients. When developing diagnostic clusters, we also recommend including a differential diagnosis algorithm and imbedding videos within the tutorial.Reflection: n/aReferences: Gowda D, Blatt B, Fink MJ, Kosowicz LY, Baecker A, Silvestri RC. A core physical exam for medical students: results of a national survey. Acad Med. 2014;89(3):436-42. Wilkerson L, Lee M. Assessing Physical Examination Skills of Senior

Medical Students: Knowing How versus Knowing When. Acad Med. 2003 Oct;78(10 Suppl):S30-2. Yudkowsky R, Otaki J, Lowenstein T, Riddle J, Nishigori H, Bordage G. A hypothesis-driven physical examination learning and assessment procedure for medical students: initial validity evidence. Med Educ. 2009;43(8):729-40

Poster S-53: A Peer-Led Research Symposium for Medical Students

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Purpose/Problem Statement: Research experience helps medical students develop rigorous scholarly inquiry, time management, and effective communication but often has minimal formal presence in medical education. To address this discrepancy at our institution, we organized annual interactive peer-led symposia meant to provide guidance and empirical advice to preclinical students interested in participating in research [1]. Each symposium is restructured based on student feedback from the previous year. We present herein the results of the third iteration of this symposium.Methods/Approach: We electronically surveyed all preclinical students at the Warren Alpert Medical School of Brown University on their past research experience, current research interests, and opinions on potential symposium topics. To select our peer panelists, we also surveyed all fourth-year medical students on their involvement in research and chose a cohort of panelists with diverse project interests and experiences with publication [2]. We selected the major topics of the symposium using 1) results from the pre-symposium survey completed by preclinical students and 2) a post-symposium survey completed by students who attended the second annual research symposium. In response to feedback from the second symposium, we devoted one section to research “pitfalls” that panelists had to overcome and a second section to “pearls” regarding four major topics: time management, selecting a research mentor and project, and managing a project. Using an online voting system, we also incorporated a live question and answer (Q/A) session following a discussion of each topic. In addition, we electronically surveyed attendees for feedback at the end of the symposium.Results/Lessons learned: The pre-symposium survey was completed by 35% (92/264) of preclinical students. Respondents’ past research experience included presenting a poster (53%; 49/92), presenting a talk at a conference (26%; 24/92), co-authorship on a publication (42%; 39/92), and first-authorship on a publication (16%; 15/92). Topics most requested were selecting a mentor (79%; 73/92), choosing a project (59%; 54/92), project management (50%; 46/92), and time management (41%; 38/92). Fifty (19%) students attended the symposium. Four fourth-year student panelists with previous publications in peer-reviewed journals discussed “pearls” and “pitfalls” regarding the four most requested topics. The post-symposium survey was completed by 44% of attendees (22/50): 45% (10/22) found the Q/A session the most helpful; 32% (7/22) found the “pearls” the most helpful; and 27% (6/22) found the “pitfalls” the most helpful. Many students commented that they wanted longer Q/A sessions. On a scale from one to ten, students rated the symposium a mean of 7 in terms of helpfulness in addressing their questions about research. Survey responses suggest that while “pearls” of advice and troubleshooting “pitfalls” are both effective techniques, students considered Q/A sessions to be most helpful.Discussions and conclusions/Significance: Peer-assisted learning is an effective method of providing preclinical students guidance on the nuts and bolts of research. The symposium can be adapted to a wide range of topics and reproduced at institutions looking to expand student involvement in research.Reflection: Limitations of the symposium include time constraints precluding in-depth discussion of all targeted topics, tailoring the presentation to a general rather than a specific group of students (e.g., based on prior experience), and conflicting advice from panelists. Future directions include (a) devoting more time to Q/A and soliciting specific questions beforehand for panelists to address and (b) developing separate

symposia for students with no research experience and for students with prior research experience who want to learn about the nuances of selected topics, including publishing and presenting scholarly work.References: [1] Young BK, Cai F, Tandon VJ, George P, and Greenberg PB. Promoting medical student research productivity: the student perspective. RIMedJ. 2014;97(6):50-2. [2] Hayat F. The use of peer-assisted learning in medical education. Medical Teacher. 2012;34(3):258.

Poster S-54: The role of third year electives in enhancing career decisions and clinical knowledge

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Purpose/Problem Statement: n/aMethods/Approach: With the projected physician shortages it is imperative that medical students make informed career decisions. The fields of primary care and general surgery are projected to have some of the highest shortages in particular.2,3 Resident attrition rates can reach up to 32% in some specialties.1 Trainees, training programs, and those respective specialties would benefit from medical students' increased exposure to their intended field. Mihalynuk et al.2 demonstrated that for the overwhelming majority of medical students, a 2 week elective held tremendous value in planning fourth year and thus their careers. Moreover, these electives developed students' medical knowledge and skills.2 Exposure to a field has been demonstrated to be invaluable for medical student career decisions.1-3 Simply raising specialty awareness increases interest in choosing that specialty later as a career.3 Montgomery et al.3 state that even suturing or operating the laparoscopic camera significantly increased the likelihood of entering a surgical career. Improving the process of medical student specialty choice may decrease resident attrition rates and increase future career satisfaction.Results/Lessons learned: During third year we have four 1-week electives varying from preset clinical or research experiences, to student-designed electives. I chose to design an elective in pediatric cardiology. This required creating a proposal detailing the course description, specific learning objectives, school of medicine core competencies to be met, as well as evaluation criteria and methods. This proposal was then submitted to the Chief of Pediatric Cardiology and the Office of Undergraduate Medical Education – Flexible Clinical Elective Course for approval. Upon approval, logistics were coordinated with the Chief of Pediatric Cardiology.Discussions and conclusions/Significance: During the week of Pediatric Cardiology I was able to better appreciate the specialty, and gain medical knowledge that furthered my clinical, scientific, and patient care skills. This experience also refined my ability to establish realistic objectives that could be met within the set parameters of a week. Student designed electives can be difficult to integrate with other clerkships and rotations due to the fact that they are not consistently built into the department's overall schedule. For example, my elective coincided with two fourth year medical students. This posed a challenge in regards to limitations of space and getting adequate patient exposure.Reflection: Medical students must choose from a broad array of specialties. By the end of third year one must select fourth year sub internships and electives, effectively choosing a career. Besides the required clerkships during third year, there are few opportunities for career exploration, with time for optional electives varying between institutions. As previously demonstrated by Mihalynuk et al.2, this experience reinforces the fact that career exploration during third year is essential to future career selection, enabling more informed decisions and increased career satisfaction, and furthermore it expands the fund of knowledge and clinical skills. Medical school curriculums need to adapt to the evolving medical field, including career exploration, which may entail creating dedicated time for such endeavors. Exploring how career decisions are made and improving upon that process could benefit not only medical students, but the medical profession

as a whole.References: 1. Sweeney K, Fritz R, Rodgers S. Careers in Medicine at Vanderbilt University School of Medicine. Academic Medicine. 2012; 87(7): 942-948. doi:10.1097/acm.0b013e3182582698. 2. Mihalynuk T, Leung G, Fraser J, Bates J, Snadden D. Free choice and career choice: clerkship electives in medical education. Med Educ. 2006; 40(11):1065-1071. doi:10.1111/j.1365-2929.2006.02614.x. 3. Montgomery S, Privette A, Ferguson P, Mirdamadi M, Fakhry S. Inadequately marketing our brand. Journal of Trauma and Acute Care Surgery. 2015; 79(5):858-864. doi:10.1097/ta.0000000000000851.