

THE REFERRING PHYSICIANS' GUIDE TO
NEUROINTERVENTIONAL RADIOLOGY
AT UMASS MEMORIAL MEDICAL CENTER



UMassMemorial
Medical Center

DIVISION OF NEUROINTERVENTIONAL RADIOLOGY AT UMASS MEMORIAL MEDICAL CENTER

In the Division of Neurointerventional Radiology and the Integrated Cerebrovascular Program at UMass Memorial Medical Center we welcome the opportunity to provide comprehensive, state-of-the-art ***minimally invasive*** care to patients suffering from vascular diseases of the brain and spine, including aneurysms, malformations, stroke, radiofrequency ablation, vertebroplasty and kyphoplasty. The Division of Neurointerventional Radiology is home to several world-renowned physicians, fellows and advanced practice providers. The breadth of their clinical expertise combined with the intellectual synergy of their research partnership with the renowned New England Center for Stroke Research (NECStR), directed by Matthew Gounis, PhD, affords patients in New England access to cutting-edge technology and prestigious clinical trials.

SERVICES OFFERED BY OUR SPECIALISTS

BRAIN:

- Diagnostic cerebral (brain) angiography
- Cerebral aneurysm treatment (coil embolization, stent assisted coiling, WEB device and flow diversion)
- Acute stroke intervention
- Carotid/vertebral artery stenting
- Cerebral arteriovenous malformations (AVMs) and dural fistula embolization
- Intracranial angioplasty and stenting
- Pediatric vascular anomaly treatment
- Tumor embolization
- Vasospasm treatment
- Intra-arterial chemotherapy for brain tumors
- Middle meningeal artery embolization for subdural hematomas
- Venous sinus stenting for Idiopathic Intracranial Hypertension (IIH)

HEAD AND NECK:

- Epistaxis (nose bleed) treatment
- Facial vascular malformation treatment
- Treatment of tumor related hemorrhage
- Tumor biopsy
- Tumor embolization



SPINE:

- Spinal vascular malformations
- Vertebral body fracture augmentation (balloon kyphoplasty and vertebroplasty)
- Vertebral body: Percutaneous tumor radiofrequency ablation
- Bone and para-spinal biopsy
- Diagnostic spinal angiogram

Our neurointerventional radiology team is available for second reads of CT, CTA, MRI and MRA scans for all cerebrovascular diseases.

BRAIN ANEURYSMS

Approximately three to six million (or one in 50) people in the United States have unruptured brain aneurysms. The annual rate of subarachnoid hemorrhage due to an aneurysm rupture is about eight to 10 in 100,000 people. Aneurysms rupture in all age groups, but the incidence is most prevalent in people age 50 to 60 years and more frequently in women, smokers and those with high blood pressure. We use state-of-the-art minimally invasive techniques to safely treat ruptured aneurysms with endovascular coil embolization. Unruptured aneurysms are treated in the same manner, sometimes in combination with a stent, WEB device or a new tool called a flow diverter. A flow diverter is a fine mesh tubular pervious graft that is placed in the healthy artery across the neck of the aneurysm to reduce the flow of blood and shrink the aneurysm. The flow diverter also serves as a scaffold for the growth of healthy endothelial tissue. This minimally invasive option offers cerebral aneurysm treatment using a small incision in the groin or the wrist. The catheter (narrow hollow tube, usually less than one mm in diameter) goes inside the arteries to the aneurysm and blocks the flow of blood preventing any rupture. The patient usually goes home the next day with minimal downtime.

TOOLS USED FOR MINIMALLY INVASIVE TREATMENT OF BRAIN ANEURYSMS



*Super soft
platinum coil*

*Low profile
stent*

*Flow
diverter*

*WEB
device*

*Tip of a pen
(for scale)*

ARTERIOVENOUS MALFORMATIONS/DURAL (LINING OF THE BRAIN) ARTERIOVENOUS FISTULAS

An arteriovenous malformation (AVM) is an abnormal collection of blood vessels generally fed by one or several arteries and drained by one or several veins. The AVM may rupture, causing death in almost one-third of the patients and leaving the remaining patients with various degrees of disability. About six percent of patients with AVMs will also have associated brain aneurysms. AVMs are rare, occurring in about 0.2 percent of the population or one in 500 persons. At UMass Memorial Medical Center, our multidisciplinary team of neurointerventional radiologists, neurosurgeons, neurologists, and radiation oncologists are involved in the complex treatment of AVMs. Via the endovascular approach, we use a “glue-like” substance to embolize the AVM, eliminating the blood supply to the AVM and making it easier for surgical resection. Depending on the location of the AVM, radiation therapy may be used as an adjunct therapy.

ISCHEMIC STROKE

It is estimated that there is one stroke every 40 seconds in the United States. About 87 percent of all strokes in the United States are ischemic strokes. In an ischemic stroke, a large or a small vessel becomes occluded from an embolus originating from either carotid artery disease or the heart. Rarely, the embolus may stem from a clot in the leg or from an opening in the heart chambers (patent foramen ovale). More than one-third of ischemic strokes involve a large vessel, and application of intravenous tissue plasminogen activator (IV tPA) alone has limited success in treating large vessel stroke. Only eight percent of patients with ischemic stroke are eligible for IV tPA. When appropriate, we may use local doses of intra-arterial (IA) tPA combined with mechanical clot removal, also known as thrombectomy, to improve a patient’s chance of survival and decrease stroke sequela. We may also use thrombectomy in patients who are not eligible or have failed IV tPA and are outside the timeframe for a safe IV tPA treatment. Recent randomized trials have shown great outcomes in patients (chosen with proper imaging) who present for thrombectomy within 24 hours after symptom onset.

Working in cooperation with our stroke neurologists and neurointensivists has significantly improved clinical outcomes in patients undergoing thrombectomy and increased the role of *minimally invasive* techniques in the treatment of acute stroke.

IDIOPATHIC INTRACRANIAL HYPERTENSION

Idiopathic intracranial hypertension (IIH), previously known as pseudotumor cerebri, is a syndrome occurring most commonly in women of childbearing age and characterized by increased intracranial pressure (ICP) without an intracranial mass. The incidence of IIH is increasing in proportion to the epidemic of obesity and is around 3.5/100,000 in females 15-44 years of age. Recent studies have suggested cerebral venous sinus stenosis (VSS) and resultant cerebral venous hypertension as one possible causative etiology for the development of IIH. There is developing evidence supporting venous sinus stenting for patients with medically-refractory IIH secondary to VSS with an associated pressure gradient across the stenosis

Signs and symptoms associated with IIH include persistent daily headache, visual disturbances, diplopia, and pulsatile tinnitus (ringing in the ears). Papilledema (eye nerve swelling) is normally present, which if left untreated may be a cause of insidious visual loss becoming permanent in up to 10% of patients secondary to irreversible optic nerve atrophy. More than 90% of patients with IIH have transverse sinus stenotic appearance compared with those of healthy patients on an MRI venogram.

Venous sinus stenting is a minimally invasive alternative to more invasive surgical measures, which are reserved for patients with failure of or noncompliance with medical treatment, with new or worsening visual deficits, persistent headache, or fulminant IIH.

We offer minimally invasive brain angiography and pressure measurements (manometry) in the venous sinuses. If raised pressures are confirmed, we offer placing a venous sinus stent in the narrowed portion of the sinus which results in decrease in the intracranial pressures and marked improvement in headaches, improvement in vision and resolution in tinnitus in most patients.



KYPHOPLASTY, VERTEBROPLASTY AND SPINE RADIOFREQUENCY ABLATION

A vertebral body compression fracture associated with osteoporosis, trauma, or cancer can lead to excruciating and intractable localized back pain and height reduction. The pain resulting from the fracture and subsequent loss of mobility can lead to multiple medical problems, partly related to pain medication and immobilization. These fractures frequently occur in the thoracic and lumbar spine. At UMass Memorial Medical Center, these can safely be treated with balloon kyphoplasty or vertebroplasty. One or two small needles are inserted into the compressed vertebral body through small incisions in the skin. A small balloon is then introduced through the needles and inflated to restore the height of the vertebral body. Bone cement is then injected through the needles to stabilize the fracture. In most patients this leads to significant pain relief. Vertebroplasty is like a kyphoplasty but without the use of balloons. The majority of patients go home the same day.

Spinal metastases are the most commonly encountered tumor of the spine, occurring in up to 40 percent of patients with cancer. Five percent of cancer patients may have spinal metastases and this will increase as life expectancy increases. Pain from these spinal metastases is frequently

debilitating, which often decreases quality of life. Treatment strategies involve a combination of pain medications, bisphosphonates, radiotherapy, and/or relatively extensive surgery. Minimally invasive neurointerventional radiology techniques such as vertebral augmentation and radiofrequency ablation (RFA) have shown progressive success in improving function by reducing pain in many patients with symptomatic spinal metastases. Both vertebral augmentation and RFA are increasingly being used as excellent synergistic tool with medical and/or surgical management in patients with spinal metastases. RFA and vertebral augmentation offers immense value to pain reduction and quality of life in this patient population group.

THE MULTIDISCIPLINARY APPROACH TO MINIMALLY INVASIVE NEUROENDOVASCULAR TREATMENT

The accurate diagnosis and optimal endovascular treatment of vascular diseases of the brain and spine requires the collaborative effort of several neurovascular specialists and clinical divisions. At UMass Memorial Medical Center, we have a multidisciplinary team of experts that meets weekly to discuss treatment options for patients with neurovascular diseases. The team includes:

- Neurointerventional radiologists
- Neurologists
- Neurosurgeons
- Neuroradiologists
- Neurointensivists
- Emergency medicine care providers
- Stroke care providers

We are committed to seeing your patients in a timely manner and ensuring that you are informed of their progress.

If you have any questions or would like to make a referral, please call us at 508-334-8329.

STATE-OF-THE-ART FACILITIES

At UMass Memorial Medical Center, we have two state-of-the-art angiography suites dedicated to neurointerventional radiology. Both suites contain bi-plane units that allow the neurointerventional radiologist to work with two views simultaneously. The units also can produce 3D images that allow the neurointerventional radiologists to look with high resolution at the vessels of the brain from all

angles. Special imaging sequences can also acquire CAT Scan (CT)-like images while the patient is in the angiography suite. Newly installed state-of-the-art hardware and software for image acquisition and processing reduces procedural radiation by almost **70 percent** compared to regular angiography. **We are one of the few centers in the United States with this new low-dose radiation technology for neurointerventional use.** This is made possible through our research relationship with leaders in medical imaging. Our angiography surgical tables can support patient weights up to 550 pounds.

NOVEL MINIMALLY INVASIVE APPROACH

In addition to traditional groin access, the Neurointerventional Radiology Department is one of the world's leading centers for distal radial artery (artery of the "snuffbox" hand) access for minimally invasive brain interventions. We perform simple angiograms to complex neurointerventional procedures from the artery of the wrist or the artery of the hand. It is much safer and better for patient comfort than traditional arterial access sites. Our NIR physicians are leading teaching faculty for other specialties who are interested in learning about minimally invasive access options.



Radial artery access in the wrist



Distal radial artery in the hand region "snuffbox"

ACCESS TO NOVEL THERAPIES THROUGH CLINICAL STUDIES

For patients who qualify, UMass Memorial Medical Center offers access to numerous, ongoing national, and international clinical trials in conjunction with our academic partner, the University of Massachusetts Medical School. These studies – both investigator-initiated as well as multicenter pivotal studies – offer novel therapies that may improve a patient's survival and/or quality of life. These studies, centered on brain aneurysm (**minimally invasive**), carotid stenting, and acute stroke therapies, offer the patients in central MA a unique opportunity for therapy with novel cutting-edge technology. Due to the number of active trials and studies at UMass Memorial Medical Center, patients receiving care here have access to these new devices, drugs and procedures years before they're available for the general population.

The technology for high-resolution cone-beam CT to image micro-AVMs in 3D for precise treatment planning was developed at the University of Massachusetts, and we were the first in the world to deploy it.

DEDICATED ADVANCED PRACTICE PROVIDERS CAREFULLY COORDINATE CARE

Navigating the diagnosis and treatment process can feel overwhelming to patients facing an illness or procedure. Our dedicated advanced practice providers make it easier, coordinating all the necessary steps to ensure that patients are diagnosed, and treatment is initiated as quickly as possible.

Our advanced practice providers serve as advocates, patient care coordinators, liaisons between patients and providers, educators and resource coordinators. They are a one-stop resource for answers to any questions or concerns patients and family members may have along the way – ensuring that they know they are not alone.

EXTENSIVE SUPPORT AND EDUCATION RESOURCES

The Division of Neurointerventional Radiology at UMass Memorial Medical Center is committed to continued medical education. The division holds regular presentations and lectures for EMS (Emergency Medical Services) personnel, Emergency Department staff, rehab facilities and other health care personnel. Team members provide knowledge and information about standards of care and latest technology available to treat brain and spine conditions. During office consults and/or during a hospital stay, patients and their family members are given extensive educational material and resources for further education regarding their needs.

Please contact us at 508-334-8329 if you would like one of our neurointerventionalists to visit your practice and discuss our program in more detail.

EXPERT CARE, CLOSE TO HOME

Dealing with an illness is difficult enough without the added inconvenience and expense of traveling into Boston. With the depth and breadth of medical and surgical expertise available at the hospitals of UMass Memorial Health Care, your patients have close-to-home access to high-quality diagnostic and treatment services, some that you can't get anywhere else in the New England region. We offer a specialized and superior level of personalized care.

TEAM APPROACH THAT INCLUDES THE REFERRING PHYSICIAN

As a primary care physician or specialist who refers a patient to us, you are an integral member of our team. You are informed about each patient you refer to us with timely follow-up after any intervention. Our neurointerventional radiologists and advanced practice providers are always accessible by telephone, pager and email, any time of day or night.

HOW TO MAKE A REFERRAL

NON-URGENT:

Call our dedicated scheduling coordinator at **508-334-8329**, 8 am to 4:30 pm, Monday through Friday (excluding holidays). Our coordinator is available to answer any questions related to the referral and scheduling process, and is a liaison to the rest of our neurointerventional radiology team.

Our service offers:

- Easy and quick access
- Timely consultation with a member of our Neurointerventional Radiology team
- Access to our advanced practice providers for questions and to assist with care coordination
- Specially trained staff members dedicated to neurointerventional procedures

URGENT:

Monday – Friday: 7 am – 5:30 pm, dial **774-443-2645 (COIL)**

Nights, weekends and holidays: dial **508-334-1000** (UMass Memorial Medical Center Hospital Operator) request to have the on call **NeuroInterventional Radiologist (NIR)** paged.

HOW TO SCHEDULE A PATIENT

Physicians requesting a consult with a member of the Neurointerventional Radiology team should fax the following information to 774-441-6421:

- Signed consult request (please include office telephone number)
- Demographic information (must include patient insurance carrier, date of birth, address and telephone number)
- Pertinent imaging and testing results
- Pertinent clinic notes

Patients will be contacted directly with appointment information and instructions.

****** EPIC providers within UMass Memorial Health Care can order a consult in EPIC “Consult to Neuro Interventional Radiology” under OUTPATIENT PROCEDURES.***

NEW ENGLAND CENTER FOR STROKE RESEARCH

Matthew Gounis, PhD, is a biomedical engineer and professor of radiology. He co-founded the **New England Center for Stroke Research** at UMass Memorial Medical Center. For nearly 20 years, Dr. Gounis has performed research on the *minimally invasive* treatment of cerebrovascular disease. Along with the entire neurointerventional radiology team, Dr. Gounis and his team of researchers have been instrumental in bringing new imaging and medical device technology from the bench to the clinic. Dr. Gounis is the author or co-author of more than 100 peer-reviewed journal papers and is the 2010 recipient of the prestigious Y.C. Fung Award from the American Society of Mechanical Engineers. In addition to being the 2014-2015 chair of the Bioengineering Division of the American Society of Mechanical Engineers, Dr. Gounis is associate editor of Basic Science for the *Journal of Neurointerventional Surgery*, on the editorial board of the journal *Stroke*, and an associate editor to *Neurosurgery*.

The mission of the New England Center for Stroke Research (NECStR) is to accelerate discovery in neuroimaging, development of endovascular devices, and advancement of image-guided surgical techniques through a translational research program that collaborates seamlessly with the Division of Neurointerventional Radiology. Special focus lies on therapies for stroke using mechanical thrombectomy and thrombolytic agents, testing and developing endovascular embolization techniques for the treatment of brain aneurysms, identifying key inflammatory and cellular factors responsible for brain aneurysm evolution, and creating the next generation of imaging technology to enable safe and effective *minimally invasive* cerebrovascular surgery.

The NECStR is funded by the National Institutes of Health and grants from a broad spectrum of leaders in the medical device industry. Through its strategic partnership with leading health care imaging specialists, the NECStR develops and tests new imaging technology and applications. The NECStR performs a fundamental role in translating technology from the bench to the clinical angiography suite. Given our expertise in cutting-edge technology long before it is available clinically, our team is responsible for training physicians from around the world as new technology is advanced to treating patients in clinical trials.

Excellence in interventional neuroradiology research at the NECStR translates to our physicians within the Division of Neurointerventional Radiology being key opinion leaders in the field and having a role in the development of the technology used to treat cerebrovascular disease.

Scan our business card below directly into the contacts directory of your iPhone or smart phone. This will provide you easy access to our team anytime. There are a variety of mobile applications available.

NEUROINTERVENTIONAL RADIOLOGY



Division of Neurointerventional Radiology,
Department of Radiology
University Campus
55 Lake Avenue North
Worcester, MA 01655

Tel: 508-334-8329; Monday – Friday 8 am – 4:30 pm

Tel: 508-334-1000; after hours and ask for on call attending

Email: neurointerventional@umassmemorial.org

www.umassmemorial.org/neurointerventional

NON-DISCRIMINATION NOTICE

UMass Memorial Medical Center complies with applicable Federal and State civil rights laws and does not discriminate on the basis of race, color, national origin, citizenship, alienage, religion, creed, sex, sexual orientation, gender identity, age, or disability. Further, UMass Memorial Medical Center does not exclude people or treat them differently because of race, color, national origin, citizenship, alienage, religion, creed, sex, sexual orientation, gender identity, age, or disability.

UMass Memorial Medical Center provides free aids and services to people with disabilities to communicate effectively with us, such as:

- Qualified sign language interpreters
- Written information in other formats (large print, audio, accessible electronic formats, and other formats)

UMass Memorial Medical Center also provides free language services to people whose primary language is not English, such as:

- Qualified interpreters
- Information written in other languages

If you need these services, contact Interpreter Services, 774-441-6793 (TTY 711).

If you believe that UMass Memorial Medical Center has failed to provide these services or discriminated in another way on the basis of race, color, national origin, citizenship, alienage, religion, creed, sex, sexual orientation, gender identity, age, or disability, you can file a grievance with:

Office of Patient Advocacy
55 Lake Avenue North
Worcester, Massachusetts 01605
Phone: 774-442-3701 (TTY-711), Fax: 774-441-7766,
PatientCareServices@umassmemorial.org

You can file a grievance in person or by mail, fax, or email. If you need help filing a grievance a patient advocate representative is available to help you.

You can also file a civil rights complaint with the U.S. Department of Health and Human Services, Office for Civil Rights, electronically through the Office for Civil Rights Complaint Portal, available at <https://ocrportal.hhs.gov/ocr/portal/lobby.jsf>, or by mail or phone at:

U.S. Department of Health and Human Services
200 Independence Avenue, SW
Room 509F, HHH Building
Washington, DC 20201
Phone: 800-368-1019 or 800-537-7697 (TDD)

Complaint forms are available at <http://www.hhs.gov/ocr/office/file/index.html>.

LANGUAGE ASSISTANCE SERVICES

If you speak a language other than English, language assistance services are available at no cost to you. **Call 774-441-6793 (TTY: 711)**

Español (Spanish)- ATENCIÓN: si habla español, tiene a su disposición servicios gratuitos de asistencia lingüística. Llame al 774-441-6793 (TTY: 711).

Português (Portuguese); ATENÇÃO: se você fala português, tem à sua disposição serviços linguísticos gratuitos. Ligue para 774-441-6793 (TTY: 711).

Tiếng Việt (Vietnamese); CHÚ Ý: Nếu bạn nói Tiếng Việt, có các dịch vụ hỗ trợ ngôn ngữ miễn phí dành cho bạn. Gọi số 774-441-6793 (TTY: 711).

العربية (Arabic); ملحوظة: إذا كنت تتحدث اذكر اللغة، فإن خدمات المساعدة اللغوية تتوافر لك بالمجان. اتصل برقم 774-441-6793 (رقم هاتف الصم والبكم: 711).

Shqip (Albanian); KUJDES: Nëse flitni shqip, për ju ka në dispozicion shërbime të asistencës gjuhësore, pa pagesë. Telefononi në 774-441-6793 (TTY: 711).

नेपाली (Nepali); ध्यान दिनुहोस्: तपाइंले नेपाली बोल्नुहुन्छ भने तपाइंको निम्ति भाषा सहायता सेवाहरू नि:शुल्क रूपमा उपलब्ध छ । फोन गर्नुहोस् 774-441-6793 (टिडिवाइ: 711) ।

繁體中文 (Chinese); 注意：如果您使用繁體中文，您可以免費獲得語言協助服務。請致電 774-441-6793 (TTY: 711)。

Русский (Russian); ВНИМАНИЕ: Если вы говорите на русском языке, вы можете воспользоваться бесплатными услугами перевода. Звоните 774-441-6793 (телетайп: 711).

Kreyòl Ayisyen (French Creole); ATANSYON: Si w pale Kreyòl Ayisyen, gen sèvis èd pou lang ki disponib gratis pou ou. Rele 774-441-6793 (TTY: 711).

ខ្មែរ (Cambodian); ប្រយ័ត្ន៖ បើសិនជាអ្នកនិយាយ ភាសាខ្មែរ, សេវាជំនួយផ្នែកភាសា ដោយមិនគិតល្បួល គឺអាចមានសំរាប់បំរើអ្នក។ ចូរ ទូរស័ព្ទ 774-441-6793 (TTY: 711) ។

한국어 (Korean); 주의: 한국어를 사용하시는 경우, 언어 지원 서비스를 무료로 이용하실 수 있습니다. 774-441-6793 (TTY: 711)번으로 전화해 주십시오.

Français (French); ATTENTION : si vous parlez français, des services d'aide linguistique vous sont proposés gratuitement. Appelez le 774-441-6793 (Télétype : 711).

Italiano (Italian); ATTENZIONE: Se parlate italiano, potete usufruire di servizi di assistenza linguistica totalmente gratuiti. Chiamate il numero 774-441-6793 (TTY: 711).

λληνικά (Greek); ΠΡΟΣΟΧΗ: Αν μιλάτε ελληνικά, στη διάθεσή σας βρίσκονται υπηρεσίες γλωσσικής υποστήριξης, οι οποίες παρέχονται δωρεάν. Καλέστε στον αριθμό 774-441-6793 (TTY: 711).

Polski (Polish); UWAGA: Jeżeli mówisz po polsku, możesz skorzystać z bezpłatnej pomocy językowej. Zadzwoń pod numer 774-441-6793 (TTY: 711).

हिंदी (Hindi); ध्यान दें: अगर आप हिंदी बोलते हैं, तो आपके लिए भाषा सहायता सेवाएँ मुफ्त में उपलब्ध हैं। 774-441-6793 (TTY: 711) पर कॉल करें।

ગુજરાતી (Gujarati); સુચના: જો તમે ગુજરાતી બોલતા હો, તો નિ:શુલ્ક ભાષા સહાય સેવાઓ તમારા માટે ઉપલબ્ધ છે. ફોન કરો 774-441-6793 (TTY: 711).

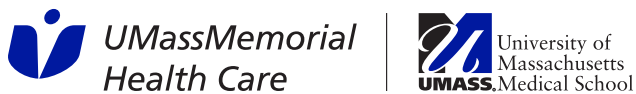
NeuroInterventional Radiology

UMass Memorial Medical Center
55 Lake Avenue North, Worcester, MA 01655
www.umassmemorial.org



Patients and families trust UMass Memorial Medical Center as the region's leading academic medical center, committed to improving the health of our communities in Central Massachusetts. With our partner, the University of Massachusetts Medical School, we are committed to excellence in primary and specialty care, community service, teaching and research. The Medical Center offers advanced technology and support services for patients and families, providing the region with specialists renowned for their expertise in caring for adults and children.

Visit www.umassmemorial.org.
General information: 508-334-1000



UMass Memorial Health Care is the largest not-for-profit health care system in Central Massachusetts with more than 14,000 employees and 1,700 physicians, many of whom are members of UMass Memorial Medical Group. Our member hospitals and entities include UMass Memorial HealthAlliance-Clinton Hospital, UMass Memorial – Marlborough Hospital, UMass Memorial Medical Center and UMass Memorial – Community Healthlink, our behavioral health agency. With our teaching and research partner, the University of Massachusetts Medical School, our extensive primary care network and our cancer, diabetes, heart and vascular, orthopedic and surgery programs, UMass Memorial delivers safe, high-quality and compassionate care.

Visit www.umassmemorialhealthcare.org.



To find a physician in your community, call 855-UMASS-MD (855-862-7763).