



# What Is the FUTURE of EMERGENCY MEDICINE?

As EMERGENCY MEDICINE celebrates its 40th anniversary, members of the journal's editorial board and other thought leaders offer their forecasts for the future of the specialty.

## Becoming the Change We All Want

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**W**hen Jim Mills left his office practice in Virginia in 1961 to start up the first emergency medicine practice in the world at Alexandria Hospital, who knew that emergency medicine would grow to become what it is today? What started out as almost a fad, an anomaly in



American medicine, has turned into one of the strongest specialties. We've gone from Jim Mills' single practice in 1961, one emergency medicine resident in 1970, one academic emergency medicine department in 1971, to more than 20,000 ABEM-certified specialists, 150 residencies, 70 academic departments, and 35,000 emergency physician FTEs.

But where do we go from here? Certainly there's still a lot of work to be done. We must end the boarding of patients in emergency departments. We must

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fund EMTALA, and we must establish an NIH study section on acute illness and injury. We must continue to train the best and brightest young physicians. We must continue our cutting-edge residency programs and board certification process. We must continue to offer the best quality and patient service of any specialty. And we must lead the house of medicine through health care reform.

We'll succeed at all these goals because of the essential traits native to all emergency physicians. We're not only talented and flexible, but we aim high and never take no for an answer. And we base our clinical practice, research, and education at all times on doing what's best for our patients.

The keys to our future success will be teamwork and the multiplier effect, which will come from having more of us available to carry the load. Remember that 40 years ago there were only a handful of emergency physicians fighting to establish the specialty. Several generations later, we are everywhere. And while we complete our expansion to include the few remaining centers without an academic emergency medicine department, we can focus on the quality of our programs. We can increase our involvement in local medical staffs and organized medicine. We can increase research, particularly research that is funded by grants and published in prestigious journals. We

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can increase the quality of patient care, operational efficiency, and customer service. We must continue to be the best patient value in America.

With teamwork, we will become the change we all want—and the change our patients need. If we all contribute, the future of emergency medicine is very bright indeed. We will have successful academic departments. We will have community practices where we are valued for our patient care. We will have ended boarding and eased the burden of EMTALA. And emergency medicine will continue to be a satisfying specialty for generations of emergency physicians to come.

Most important, our patients will continue to value us, voting with their feet more than 120 million times every year, telling the world that we are the best physicians that the U.S. medical system has to offer.

Thanks to Jim Mills and other emergency medicine pioneers like him, we succeeded in creating our unique specialty. Now it is time to make it even stronger and better. Our future depends on us.

## The Future of Pain Research in Emergency Medicine

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**E**mergency departments in the United States receive over 120 million patient visits annually. Acute pain is the presenting complaint for approximately 80 million of these visits, and chronic pain exacerbations prompt 20 million visits.

Analgesics constitute by far the largest category of drugs administered or prescribed in the emergency department.

Despite this high incidence of pain, until recently few emergency physicians or nurses were engaged in the critical study of pain management. Research in this area has grown rapidly, however, and has revealed a high prevalence of inadequate pain treatment (oligoanalgesia), risk factors for oligoanalgesia (extremes of age, ethnicity, cognitive function), and extensive small and large area variations in pain practice in the emergency department. Laboratory and clinical studies have improved our knowledge and ability to manage pain successfully, but substantial gaps remain between existing knowledge and daily pain management practice. Dedicated emergency physicians and nurses have begun to close this gap through education, providing additional resources, information about best practices, and training to emergency care providers,

as well as conducting research promoting improved patient care.

The answers to three principal questions about pain will likely drive future changes in emergency medicine pain practice:

- Why is acute pain treatment important?
- How do we know that a patient is in pain?
- How do we best treat pain?

Our answers to the first question have traditionally been driven by ethical or moral (and occasionally legal) considerations, rather than physiology. We know that untreated pain increases myocardial oxygen requirements and may predispose vulnerable patients to ischemic complications. We also know that poorly treated traumatic pain may increase the risk of pneumonia, immobility and possible deep vein thrombosis, and delays in return to function, as well as leading to higher hospital costs. We are also learning more about the association of oligoanalgesia with maladaptive endocrine responses and suppression of immune function. It is likely that empiric demonstrations of these and as yet undiscovered

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adverse effects of oligoanalgesia in the emergency department population will accelerate changes in our pain practices.

It must also be remembered that all chronic pain begins as acute pain. Epidemiologic studies of trauma center patients have documented high rates of resultant chronic pain as well as risk factors for its development. Recurrent, poorly controlled pain can cause functional and neuroanatomical nervous system changes that are seen in chronic pain conditions.

A fundamental hypothesis for emergency medicine research is whether early treatment matters. Our specialty is strategically positioned to answer the critical question of whether aggressive pain control can retard or prevent the development of chronic pain.

The second question—"How do we know that a patient is in pain?"—is frequently asked by emergency physicians. This question is most commonly prompted by concerns about addiction and our discomfort in understanding a patient's pain-related behaviors. Certainly, both pain and substance abuse are common among the populations we serve, and the differential diagnosis of chronic pain and aberrant drug-related behaviors is complex. In one condition, sickle cell disease, emergency physicians and nurses consistently overestimate the prevalence of addiction. In this setting, advances in neuroimaging may demonstrate different patterns of neural activation to help us distinguish between chronic or recurrent pain and addiction.

In exploring this question, physicians themselves may be an appropriate object of study. We should consider the influence of physician empathy on the quality of pain management. Research demonstrates that physician empathy is associated with an increased quality of care; however, it also shows that empathy declines over the course of medical training. Can interventions promoting physician empathy improve the outcomes of emergency department pain management?

And as long as the MRI machine is warmed up, wouldn't it be interesting to know what the brain of an empathetic physician looks like, as opposed to one who is not?

Finally, how should we treat pain? Current treatment patterns are often based more on tradition, personal bias, institutional preference, and industry marketing than on systematic scientific approaches. We may eventually find that multimodal therapies employing cognitive approaches and a variety of pharmacologic modalities provide the most optimal results. The research questions in this area are virtually endless.

Although pain research is challenging, a cadre of emergency medicine investigators have begun to build an evidence base that will enhance our ability to provide superior care to patients in pain. Collaborative, multidisciplinary approaches have been key to this progress, and a new generation of clinicians is pursuing in-depth training in pain medicine and research. Yogi Berra once said, "It's tough to make predictions, especially about the future." But I predict that these individuals will shape the future of emergency medicine and pain research—and I can't wait to hear what they have to tell us.

## Emergency Imaging: An Area of Increasing Specialization

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**T**o those involved in the practice of emergency medicine, it is clear that both the role and scope of imaging for the emergency department patient are undergoing a rapid evolution. While it is difficult to predict exactly what

the future of emergency imaging will be, it is clear what it will *not* be.

Emergency imaging will no longer be limited to the so-called basic or standard examinations, with more advanced studies only available elsewhere and only during “normal business hours.” Emergency medicine is not practiced only between 8 a.m. and 6 p.m. and neither should emergency radiology be. Advanced computed tomography (CT) imaging techniques have already become widely available. Many of these techniques, such as angiography/perfusion imaging for stroke or CT coronary angiography, are ideal for the emergency department setting, where they will have the greatest impact on patient care. Other advanced modalities, such as magnetic resonance imaging, continue to become more widely available and will be increasingly utilized in instances where it is superior to CT (as in acute stroke or suspected hip fracture) or in cases in which radiation must be minimized (as in children or pregnant patients).

Because of this proliferation of available techniques, emergency imaging will no longer be read by the general or on-call radiologist. It has become increasingly difficult for the radiology subspecialist or even the general radiologist to have expertise in such a wide range of studies. Just as one does not expect a neurosurgeon to perform cardiac bypass surgery, one should not expect a neuroradiologist to interpret CT coronary angiography. This challenge has led to

notable changes affecting emergency imaging.

The first is the growth of commercial teleradiology. While this modality has already established itself as a means of obtaining image interpretation (by the “nighthawk” radiologist), it is now evolving to offer subspecialty consultations day or night. While such a service allows access to much-needed expertise for many clinicians, the fear is that it will lead to the “commoditization” of radiology.

A second change is an increased recognition of emergency imaging as a subspecialty within diagnostic imaging. Just as emergency physicians are a unique group that benefits from specialized training, so are emergency radiologists. Covering the emergency department is no longer a responsibility for all radiologists to share but rather a specialty in and of itself. Increasingly, academic radiology departments are establishing dedicated emergency radiology sections. There are several emergency imaging fellowships and more on the way. Membership in the American Society of Emergency Radiology continues to grow.

What is the future of imaging techniques in the emergency department? Personally, I am excited to see how this rapidly-changing field evolves. However, one thing is certain: advances in imaging and the increasing specialization of emergency radiologists, whether on-site or somewhere in cyberspace, can only lead to improved care for the emergency department patient.

## Perfectly Suited to Shape the Future

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**O**ver the past 30 years, I have watched the specialty of emergency medicine emerge and grow into one of the most competitive in all of medicine. Once a specialty with no true or unique exper-

tise, emergency medicine today can claim leadership in many critical areas—toxicology, sports medicine, hyperbarics, EMS, ultrasound, and the initial resuscitation of the critically injured and ill. As I look to the future, I see emergency medicine continuing to expand in these already fertile fields but also expanding into more critical research studies and leadership positions in health care reform.

There is no question that more high-quality research is coming out of our emergency departments than ever before. Many of this journal's articles and those of other emergency medicine publications used to be case reports or review articles based on literature outside of the specialty. Now more and more of the literature of emergency medicine is based on rigorous, well-controlled, scientific studies from one or more respected institutions. And many are now funded by grants from the National Institutes of Health or other highly competitive funding sources.

Besides expanding our research base, I believe emergency physicians will move into highly visible local, state, and national roles as our nation develops a more equitable health care system. We in emergency medicine are uniquely positioned to witness the strengths and weaknesses of this system, its successes and failures, on a daily basis. What other group of physicians is more qualified to help us emerge from our current crisis of rising costs and inequalities? I believe this leadership involvement will carry over within individual hospitals and medical centers, as well as at all levels of government. Some of us are already heads of hospitals or deans or leaders of federal agencies. Emergency physicians are hard-working, fair, smart, personable, capable of integrating new facts easily, and quick on our feet—and therefore perfectly suited to help shape the future of health care.

As I think about the future, the one thing that makes me truly cherish my career choice of emergency medicine is that as medical care evolves, this specialty can only become even more exciting and challenging. Rather than resting on our laurels and past knowledge, we will be challenged by a specialty that will become more complex every year—with more diseases, more therapies, more technology, and probably more patients too.

Change defines our specialty. We don't even wait for patients to come into an examination room any-

more; we start work-ups out in the waiting room. Using a standard laryngoscope for intubation is so 2005; many of us now consider whether to intubate with a high-intensity light source or a fiberoptic device. And who talks about an angiogram of the head or lungs these days, when a multislice CT or MRI unit is now the imaging device of choice?

Yes, we use a lot of technology in emergency medicine—some would say too much of it and too often—yet no other specialty can work up so many different patients so quickly. I believe our future will routinely include doing more and more of what used to be one- or two-day work-ups in 8 to 12 hours, a phenomenon that has already begun at some larger institutions and will soon expand to smaller emergency departments and hospitals.

Finally, with a new administration now in place in Washington and talk of real health care reform in the air, I am hopeful that the day will come when we will be seeing more true emergencies and delivering less primary care in our emergency departments. But perhaps that's just wishful thinking.

One thing is certain: the future of emergency medicine looks bright, exciting, and challenging. It always has, of course, only now it is rooted in a long and positive history that brings with it an unprecedented sense of security and promise.

## Critical Partners in Neurologic Care

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**T**he last decade has seen a revolution in neurologic care. From the standpoint of emergency medicine, this has been most apparent in the evaluation and management of patients with acute ischemic stroke. The advent of

treatment with intravenous tissue plasminogen activator (t-PA) has improved the outcomes of selected patients with this potentially devastating condition. A recent trial indicates that the treatment window for

intravenous t-PA may be extended to as long as 4.5 hours after symptom onset. Treatment with t-PA has spurred the development of primary stroke centers, rapid response stroke teams, and stroke units.

Because expert neurologic consultative services are not available in all emergency departments, the next decade will undoubtedly see the further development of statewide stroke systems to assure that all patients with acute stroke receive optimal care. This will likely involve more widespread use of telemedicine technologies to bring stroke care expertise to facilities without access to specialists. Endovascular approaches for patients who are not candidates for intravenous t-PA will be further evaluated. Trials

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are also in progress investigating a variety of novel approaches for the treatment of patients with parenchymal intracerebral hemorrhage. Several recent studies underscore the importance of rapid evaluation and treatment of patients with transient ischemic attacks. Such evaluations may be conducted in emergency department observational units, sparing many patients the need for hospital admission. Neuroimaging technologies continue to advance, promoting more accurate diagnoses and the potential to triage patients with seemingly similar conditions to specific interventions.

Emergency neurologic care has advanced in other areas besides stroke care. The use of high-dose steroids in patients with acute spinal cord injury offers improved chances of neurologic recovery, as does hypothermia instituted soon after resuscitated cardiac arrest. A variety of new drugs and approaches have been developed for the treatment of status epilepticus. Medical approaches for the treatment of acute migraine headache continue to evolve.

The treatment of neurologic emergencies has advanced from a practice focused primarily on diagnosis to one that now embraces groundbreaking

therapeutic modalities. The near future will bring even further progress. Emergency medicine will continue to be a vital part of this revolution, with emergency physicians serving as critical partners in providing advanced therapies to patients with emergent neurologic conditions.

## Integrating Palliative Care Into Emergency Medicine

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**P**roviding care that brings comfort and is consistent with a patient's stated goals is a long-recognized component of quality care. Simply defined, palliative medicine offers relief of pain and control of

symptoms that impair quality of life for those with advanced illness, such as cancer, AIDS, organ failure, or dementia. Psychosocial and spiritual support is integrated into this model to create a well-rounded care plan that aims to improve quality of life.

In the emergency department, patients often arrive in crisis, and for those suffering from advanced illness their needs may be complex, whether it is refractory pain, social issues (such as caregiver burnout), or near-death awareness. The American College of Emergency Physicians' (ACEP's) June 2008 policy statement, "Ethical Issues at the End of Life," says that "emergency physicians play an important role in providing care at the end of life and must help patients and their families achieve greater control over the dying process."

The emergency department is uniquely positioned to address palliative care needs. Using the crisis of a visit, care goals can be addressed. Consider the elderly nursing home resident with pneumonia who arrives without a health care directive. Addressing code status with the family is an example of how the palliative care model fits into the emergency department paradigm. Hospice care and mechani-

cal ventilation in the ICU are extremely different interventions. Most emergency department providers have faced these tough choices.

If a palliative care team is available, they may be able to meet with the family to address care goals and the patient's prognosis. These discussions may begin at the bedside, led by an emergency physician, but afterward an interdisciplinary team should be brought in to provide further information and

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support to the patient and family. The palliative care team can facilitate this with input from their nurses, physician leader, social worker, and chaplain. Working across specialties is already part of the fabric of emergency medicine. Nursing, physician staff, respiratory therapy, pastoral care, pharmacy, and consultants are always at work getting patients to the operating room or the cardiac catheterization suite or other destinations. Therefore, using palliative care services is hardly a stretch for the experienced emergency department team.

In October 2006, the American Board of Emergency Medicine became one of nine boards to cosponsor the certification in hospice and palliative medicine recognized by the American Board of Medical Specialties (ABMS). Similar to other subspecialties such as cardiology or infectious disease, the ABMS certification has created a baseline skill set that physicians must possess to be considered a specialist in palliative medicine. Prior to this, palliative medicine was not recognized as a subspecialty board.

Emergency physicians are now entitled to sit for the boards and become recognized as experts in palliative medicine. To become eligible for the examination, several requirements must be met. Until 2012, physicians without a formal palliative medicine fellowship can take the exam if they can show 800 hours of clinical involvement in subspecialty-level practice of hospice and palliative medicine during the five years prior to applying for the exam. This must include two years and 100 hours of work with a hospice and palliative care team and participation

in the active care of at least 50 terminally ill patients (25 for pediatrics). Physicians can also qualify for the exam if they can show proof of certification prior to formal recognition by the ABMS.

Many emergency physicians will integrate this new skill set into their current practice, including teaching and participation in policy development. Additionally, working as part of an inpatient consult service or as a hospice medical director are other possibilities. The skills of a palliative care specialist overlap with those of the emergency physicians—especially in pain and symptom management, crisis intervention, and addressing health care directives.

One educational product, the Education on Palliative and End-of-life-Care: Emergency Medicine (EPEC-EM), is a good starting point for learning more about integrating palliative care into the emergency department setting. Other sources of information include the American Academy of Hospice and Palliative Medicine's Web site ([www.aahpm.org](http://www.aahpm.org)). The Society for Academic Emergency Medicine and ACEP have interest groups and research presentations at their national meetings.

I foresee dramatic growth in the number of emergency physicians becoming certified in these critical areas and incorporating this expertise into their practice in the years to come.

## Intriguing Options for Disaster Medicine

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**N**o one would have believed the specialty of emergency medicine could progress as far as it has in just 40 years. Therefore, one risks appearing somewhat inept in attempting to prognosticate the direction the discipline is headed. However, with respect to disaster medicine,

it is possible to offer some intriguing options for the future. The areas of education, research, and subspecialization show particular promise.

Disaster medical education was scattered, rudimentary, and inconsistent prior to the 1990s. A few pioneering courses were available, such as the medical disaster response course, but standardized and respected instruction was limited to nonexistent. However, the last 8 to 10 years have witnessed an explosion of options for those interested in disaster medical education. In

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Europe, two universities have collaborated and now offer a European Master in Disaster Medicine advanced degree. Emergency medicine residencies in the United States are now examining how to incorporate disaster medicine material into the formal curriculum. It is probable that in the future, disaster medicine subject matter will occupy several hours of instruction per year in residency programs. In addition, medical schools will begin teaching the basics of disaster medicine to medical students.

Research is another area ripe for future development. Emergency physicians are increasingly involved in publishing disaster medicine research. Many federal agencies are now offering grant funding for research in such areas as surge capacity, hospital evacuation, and managing the consequences of terrorism. However, no entity is currently dedicated specifically to the funding of disaster medicine research. In the future, it is probable that the National Institutes of Health will fill this void by creating a National Institute for Emergency Medicine with the responsibility to support disaster medicine research. In addition, Congress will support these activities by making all injuries and illnesses directly related to disasters reportable to public health. This policy will permit investigators to gather real-time data and substantially improve the care of disaster victims.

Progress in education and research will ultimately

result in disaster medicine becoming a formal subspecialty. Fellowship training in disaster medicine already exists; eight or more programs offer one to two years of post-residency education in this area. The demand for expertise in disaster medicine will increase both in the United States and internationally. At some point in the not-too-distant future, a critical mass of research, funding, and training programs will be reached and the house of medicine will formally recognize this unique subspecialty.

Hopefully, these changes will not be slow in coming. In a recent report, the Trust for America's Health and the Robert Wood Johnson Foundation declared that the United States was underprepared for a major disaster, such as a biological attack or a pandemic. Clearly, we need to move forward on this front with all deliberate speed.

## It Will Be What We Make of It

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**T**he 40<sup>th</sup> anniversary of EMERGENCY MEDICINE marks many milestones for the specialty it serves. During the past 40 years, the scope of emergency medicine practice has been defined and broadened, training programs and new subspecialties have flourished, and a steady stream of dedicated research continually informs our practice. The development of advanced diagnostics, the refinement of lifesaving procedures, and emergency physicians' famous capacity for multitasking have made the emergency department the optimal setting in which to evaluate and care for the most seriously ill and traumatized patients. For these reasons and more, it has also become a medical safety net and even the preferred venue for any and all medical care for some patients.

The challenges that emergency medicine will face in the future will probably be just as impressive as its past achievements. Many regions of the country are feeling the effects of shortages in the number



of physicians practicing in backup specialties and in other important resources. This problem may only worsen and become more widespread. There is an increasing demand for emergency medicine services

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just about everywhere, yet our capacity in brick-and-mortar terms remains fairly fixed.

In the emergency department, we control expensive health care resources, and as costs rise we must use these resources more and more judiciously. Integrating data from the emergency department into each patient's overall continuing care will become more important as the number of patients living with

multiple and complex medical problems increases. Whether technology—in the form of telemedicine, electronic health records, new diagnostic and treatment modalities, and genomic medicine—will make us more efficient or more frustrated, save money or cost money, improve care or complicate it, will only be determined over time.

Emergency physicians have always seemed to be the most willing of all health care providers to critically examine the political, regulatory, economic, scientific, and commercial influences that affect what we do and what we're made to do, and to participate in the processes by which these influences evolve. I think we can be hopeful that the same individual and collective persistence and problem-solving that has created and nurtured the specialty will give rise to the solutions we and our patients will need. We've learned that and more from the founders and leaders of our specialty.

Meeting these challenges, while continuing to save lives, treat disease, and compassionately alleviate pain and suffering, is the future of emergency medicine. It will be what we make of it, just as the past 40 years have made us what we are today. □