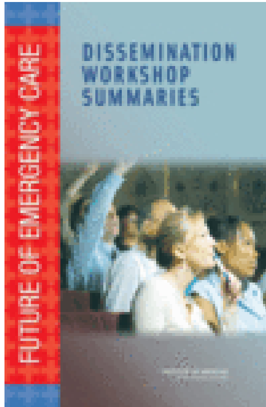

Future of Emergency Care: Dissemination Workshop Summaries

Megan McHugh and Peter Slavin, Rapporteurs, The Future of Emergency Care Workshop Planning Group

ISBN: 0-309-66846-8, 162 pages, 6 x 9, (2007)

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FUTURE OF EMERGENCY CARE

DISSEMINATION WORKSHOP SUMMARIES

Megan McHugh and Peter Slavin, *Rapporteurs*

The Future of Emergency Care Workshop Planning Group
Board on Health Care Services

INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

THE NATIONAL ACADEMIES PRESS
Washington, D.C.
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NOTICE: The project that is the subject of this report was approved by the Governing Board of the National Research Council, whose members are drawn from the councils of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

This study was supported by Contract No. HHSH25056047, TO#2 between the National Academy of Sciences and the Agency for Healthcare Research and Quality, the Centers for Disease Control and Prevention, the Health Resources and Services Administration, and the National Highway Traffic Safety Administration. Support was also provided by the American Academy of Pediatrics, the American College of Emergency Physicians, the American College of Surgeons, the Association of Academic Chairs of Emergency Medicine, the Council of Emergency Medicine Residency Directors, the Emergency Medicine Residents' Association, the Emergency Nurses Association, the National Association of EMS Physicians, the Robert Wood Johnson Foundation, and the Society for Academic Emergency Medicine. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the organizations or agencies that provided support for this project.

International Standard Book Number-13: 978-0-309-10468-5
International Standard Book Number-10: 0-309-10468-8

Additional copies of this report are available from the National Academies Press, 500 Fifth Street, N.W., Lockbox 285, Washington, DC 20055; (800) 624-6242 or (202) 334-3313 (in the Washington metropolitan area); Internet, http://www.nap.edu.

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The serpent has been a symbol of long life, healing, and knowledge among almost all cultures and religions since the beginning of recorded history. The serpent adopted as a logotype by the Institute of Medicine is a relief carving from ancient Greece, now held by the Staatliche Museen in Berlin.

Suggested citation: IOM (Institute of Medicine). 2007. *Future of Emergency Care: Dissemination Workshop Summaries*. Washington, DC: The National Academies Press.

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"Knowing is not enough; we must apply.
Willing is not enough; we must do."
—Goethe

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Reviewers

This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the National Research Council's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following individuals for their review of this report:

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Although the reviewers listed above have provided many constructive comments and suggestions, they were not asked to endorse the final draft of the report before its release. The review of this report was overseen by Dr. Melvin Worth, Scholar-in-Residence, Institute of Medicine. Appointed

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by the National Research Council and Institute of Medicine, he was responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authors and the institution.

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Acknowledgments

We are grateful to the members of the workshop planning group, who volunteered their time and intellectual efforts to shape the workshop programs, identify topics, and select contributors. We would also like to express our appreciation to the many individuals that participated on workshop panels as well as other speakers and discussants who contributed to the workshops (see Appendixes A and B for the workshop agendas and list of participants).

Finally, the workshops were organized with the generous assistance of many individuals and organizations in Utah, Illinois, and Louisiana. We acknowledge in particular the logistical support and hospitality provided by the staffs of Primary Children's Medical Center, the University of Utah Health Sciences Center, the Utah Department of Health, Northwestern Memorial Hospital, and Tulane University School of Public Health and Tropical Medicine.

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1

Introduction

In June 2006, the Institute of Medicine (IOM) Committee on the Future of Emergency Care in the U.S. Health System released a series of reports on the state of emergency care. The reports, *Emergency Medical Services at the Crossroads*; *Hospital-Based Emergency Care: At the Breaking Point*; and *Emergency Care for Children: Growing Pains*, identified a number of disturbing problems including overcrowded emergency departments, a lack of coordination among emergency providers, variability in the quality of care provided to patients, workforce shortages, lack of disaster preparedness, a limited research base, and shortcomings in the systems' ability to care for pediatric patients. These problems, while apparent to those who work in the field, are largely hidden from public view, in part because popular fictional television programs frequently depict the emergency care system in fine shape. Despite the lifesaving feats performed every day by emergency departments and ambulance services, the nation's emergency medical system as a whole is overburdened, underfunded, and highly fragmented.

The exposure of some of the shortcomings in the nation's emergency care system coincided with the 40th anniversary of the National Academy of Sciences/National Research Council 1966 report, *Accidental Death and Disability: The Neglected Disease of Modern Society*. The report prompted public outcry by describing an epidemic of automobile-related and other

The planning committee's role was limited to planning the workshops, and the workshop summaries have been prepared by the workshop rapporteurs as factual summaries of what occurred at the workshops.

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injuries and the poor state of trauma care nationwide. Nevertheless, the report made a tremendous impact; it is widely viewed as the impetus for the creation of the trauma and prehospital emergency medical services (EMS) systems, the specialty in emergency medicine, and federal programs to enhance the emergency care infrastructure and research base. A similar opportunity exists today for the advancement of emergency care.

The IOM received funding from 14 organizations to conduct a series of dissemination workshops associated with the release of the 2006 reports on the future of emergency care. Sponsors included the Agency for Healthcare Research and Quality, the American Academy of Pediatrics, the American College of Emergency Physicians, the American College of Surgeons, the Association of Academic Chairs of Emergency Medicine, the Centers for Disease Control and Prevention, the Council of Emergency Medicine Residency Directors, the Emergency Medicine Residents' Association, the Emergency Nurses Association, the Health Resources and Services Administration, the National Association of EMS Physicians, the National Highway Traffic Safety Administration, the Robert Wood Johnson Foundation, and the Society for Academic Emergency Medicine. The sponsors recognized that advancing emergency care will take a concerted effort by the principal stakeholders—federal, state, and local officials; hospital leadership; physicians, nurses, emergency medical technicians, and other clinicians; and the public. The workshops were intended to engage those stakeholders.

The purpose of the dissemination workshops was to (1) provide a forum to engage the public and stakeholder groups in a national discussion of issues identified in the three IOM reports on the future of emergency care; (2) disseminate findings from these reports; (3) explore the implications of the recommendations in the reports at the federal, state, and local levels; (4) identify continuing research and data needs; (5) and consider implementation issues and strategies connected with the recommendations. The purpose was not to change the findings or recommendations in the three IOM reports, but rather to provide an opportunity to discuss the issues publicly. The workshops were organized by a nine-member workshop planning group that selected the locations for the workshops, the broad topics for discussion, the structure of the agenda, and the presenters.

Three one-day regional dissemination workshops were conducted in Salt Lake City, Utah (September 7, 2006), Chicago, Ilinois (October 27, 2006), and New Orleans, Louisiana (November 2, 2006). Each of the workshops featured focused discussions in two issue areas. The meeting in Salt Lake City focused on pediatric emergency care and care in rural areas; in Chicago it was workforce issues and hospital efficiency; and in New Orleans it was EMS issues and disaster preparedness. The workshops included panels comprised of experts and key stakeholders drawn from the region and nationally. A fourth capstone workshop, held in Washington, D.C.,

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provided an opportunity to engage congressional and other federal policy leaders in a discussion of emergency care issues. All workshops featured invited presentations and structured discussions. In addition, time was reserved at each workshop for attendees to pose questions to IOM committee members and the invited panelists.

This report summarizes the proceedings of the workshops. Each regional workshop began with an overview of the findings and recommendations from the three reports on the future of emergency care. Those findings and recommendations are summarized in the next chapter. The remainder of the report devotes one chapter to each of the workshops. The agendas of the workshops are found in Appendix A and a list of attendees appears in Appendix B. Appendix C contains a glossary of the acronyms used in this document.

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2

The Institute of Medicine Study on the Future of Emergency Care

Each of the three regional workshops began with an introduction to the Institute of Medicine's (IOM's) study on the Future of Emergency Care in the U.S. Health System and an overview of the key findings and recommendations from the three study reports. The information, presented by members of the IOM committee, is summarized here.

EMERGENCY CARE IN THE UNITED STATES

Emergency and trauma care are critically important to the health and well-being of the U.S. population. The emergency care system handles an extraordinary range of patients, from febrile infants, to business executives, to elderly patients who have fallen. It provides not only urgent life-saving care but also primary care services to the millions of people who otherwise lack access to other health care services. In 2003, nearly 114 million visits were made to hospital emergency departments (EDs)—more than 1 for every 3 people in the United States. More than 16 million of those patients arrived at the ED by ambulance.

The emergency care system in the United States has made important strides over the past 40 years: emergency 9-1-1 service now links virtually all ill and injured people to an emergency medical response; prehospital emergency medical services (EMS) teams arrive to transport patients to definitive care; and scientific advances in resuscitation, diagnostic testing, trauma, and emergency medical care yield outcomes unheard of just two decades ago. Yet just beneath the surface, a growing crisis in emergency care is emerging—one that threatens access to quality care for all. EDs across the

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country are overcrowded. Ambulances are turned away, and patients, once they are admitted, may wait in hallways for hours or even days before inpatient beds open up for them. Often the specialists that patients need to see are not available. And the system that transports patients to the hospitals is fragmented and inconsistent in the level of quality it provides.

The IOM Committee on the Future of Emergency Care was formed in September 2003 to examine the full scope of emergency care; explore its strengths, limitations, and challenges; create a vision for the future of the system; and make recommendations to help the nation achieve that vision. Over 40 national experts from fields including emergency care, trauma, pediatrics, health care administration, public health, and health services research participated on the committee or one of its subcommittees. In June 2006, the committee released three reports: *Emergency Medical Services at the Crossroads*; *Hospital-Based Emergency Care: At the Breaking Point*; and *Emergency Care for Children: Growing Pains*. These reports provided complementary perspectives on the emergency care system, while the series as a whole presented a common vision for the future of emergency care in the United States.

This study was requested by Congress and funded through a congressional appropriation, along with additional sponsorship from the Josiah Macy Jr. Foundation, the Agency for Healthcare Research and Quality, the Health Resources and Services Administration, the Centers for Disease Control and Prevention, and the National Highway Traffic Safety Administration.

THE COMMITTEE'S FINDINGS

Overcrowding

The emergency care system in the United States is in many ways a victim of its own success. Not only has the hospital ED become the place that people turn to first when they have an illness or injury that demands immediate attention, but it has also been given an increasing number of other responsibilities as well. EDs today provide much of the medical care for patients without medical insurance. Insured patients increasingly turn to the ED during times when their physician is unavailable, such as evenings and weekends, and they are often sent to the ED for tests and procedures that their physician can't easily perform in the office. In some rural communities, the hospital ED may be the main source of health care for a large percentage of residents. EDs also play a key role in public health surveillance and in disaster preparation and response.

The number of patients visiting EDs has been growing rapidly. There were 113.9 million ED visits in 2003, for example, up from 90.3 million a

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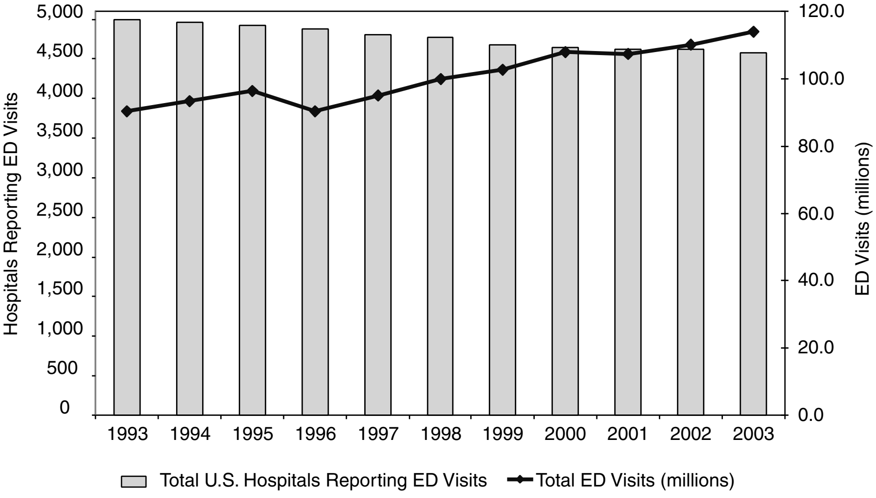

FIGURE 2-1 Hospital emergency departments and emergency department visits.
SOURCE: American Hospital Association Hospital Statistics and National Hospital Ambulatory Medical Care Survey (NHAMCS).

decade earlier. At the same time, the number of facilities available to deal with these visits has been declining. Between 1993 and 2003, the total number of hospitals in the United States decreased by 703, the number of hospital beds dropped by 198,000, and the number of EDs fell by 425 (Figure 2-1).

The result has been serious overcrowding. If the beds in a hospital are filled, patients cannot be transferred from the ED to inpatient units. This can lead to the practice of "boarding" patients—holding them in the ED, often in beds in hallways, until an inpatient bed becomes available. It is not uncommon for patients in some busy EDs to be boarded for 48 hours or more. These patients have limited privacy, receive less timely services, and do not have the benefit of expertise and equipment specific to their condition that they would get in the inpatient department.

Another consequence of overcrowding has been a striking increase in the number of ambulance diversions. Once considered a safety valve to be used only in the most extreme circumstances, such diversions are now commonplace. Half a million times each year—an average of once every minute—an ambulance carrying an emergency patient is diverted from an ED that is full and sent to one that is farther away. In 2004, according to the American Hospital Association, nearly half of all hospitals—and close to 70 percent of urban hospitals—diverted patients at some point during the year. Each diversion adds precious minutes to the time before a pa-

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tient can be wheeled into an ED and be seen by a doctor, and these delays may in fact mean the difference between life and death for some patients. Moreover, the delays increase the time that ambulances are unavailable for other patients.

Fragmentation

The modern emergency care system is a relatively new innovation. In the 1950s, for example, emergency medicine was not a recognized specialty, and hospital emergency rooms were generally staffed by internists or primary care physicians, most of them young and inexperienced. There were no paramedics as such—EMS offered little more than first aid, and the local ambulance service often consisted of just a hearse and a mortician.

Since then the emergency care system has developed rapidly. The "emergency room" has become the "emergency department," and it is now frequently staffed with specialists trained in emergency medicine. Many ambulances employ specialized equipment and EMS personnel trained to stabilize patients and keep them alive until they reach the hospital. But the organization and delivery of these services has lagged behind their technical capabilities, limiting communication and cohesion among the various components of the system. As a result, today's emergency care system is highly fragmented and variable.

A single population center may have many different EMS agencies—some volunteer, some paid, some based in fire departments, others operated by hospitals or private companies—and these agencies do not always interact with one another effectively. EMS workers often cannot even communicate with police and fire departments because they lack compatible communications equipment or operate on different frequencies. Furthermore, EMS agencies in one jurisdiction are often unable to communicate with those in adjoining areas.

A similar lack of coordination exists between EDs and the EMS services that deliver their patients. Few systems around the country coordinate the regional flow of emergency patients to hospitals and trauma centers effectively, because most fail to take into account such things as the levels of crowding and the differing sets of medical expertise available at each hospital. Indeed, in most cases, the only time an ED passes along information concerning its status to EMS agencies is when it formally goes on diversion and refuses to take further deliveries of patients. As a result, the regional flow of patients is managed poorly, and individual patients may have to be taken to facilities that are not optimal given their medical needs.

Adding to the fragmentation is the fact that there is tremendous variability around the country in how emergency care is handled. Belying its apparent uniformity, there are actually more than 6,000 9-1-1 call centers

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around the country. Depending on their location, they may be operated by the police department, the fire department, the city or county government, or some other entity. Moreover, there are no nationwide standards for the training and certification of EMS personnel—or even any national accreditation of the institutions that train them. No single agency in the federal government oversees the emergency and trauma care system. Instead, responsibility for EMS services and for hospital-based emergency and trauma care is scattered among many different agencies and federal departments, including Health and Human Services, Transportation, and Homeland Security. Because responsibility for the system is so fractured, it has very little accountability. In fact, it can be difficult even to determine where system breakdowns occur or why.

Shortage of On-Call Specialists

Emergency and trauma doctors can be called on to treat nearly any type of injury or illness, so it is important for them to be able to consult with specialists in various fields. It has become increasingly difficult, however, for EDs to find specialists who will agree to be on call for the ED, and the resulting shortage of on-call specialists in EDs has had dire and sometimes tragic results.

There is a variety of reasons for the shortage of on-call specialists. Many specialists find that they have difficulty getting paid for their ED services because many emergency and trauma patients are uninsured. Specialists are also deterred by the additional liability risks of working in the ED. Many of the procedures performed in EDs are inherently risky, and physicians rarely have an existing relationship with emergency patients. The result is that insurance premiums for doctors who serve as on-call specialists in the ED are much higher than for those who do not. Finally, many specialists find the demands of providing on-call services too disruptive to their private practices and their family life. After being in surgery all day, they have little desire to be called back into the hospital in the middle of the night, often without the assurance of payment for their services.

Lack of Disaster Preparedness

Any time a disaster strikes, whether it is a natural disaster, a disease outbreak, or a terrorist attack, EMS and hospital EDs are called on to take care of the ill and the wounded. The nation's emergency care system is poorly prepared to handle such disasters.

The difficulties begin with the already-overcrowded state of the system. With hospitals in many large cities operating at or near full capacity, even a multiple-car highway crash can create havoc in an ED. A major disaster

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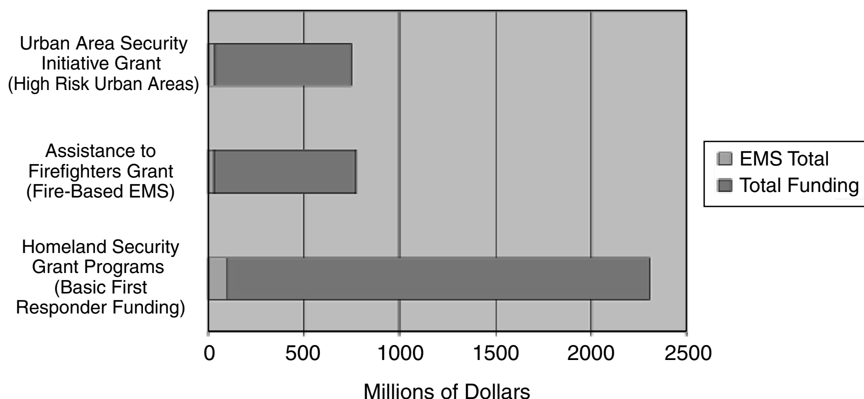

FIGURE 2-2 Emergency medical services receive only 4 percent of first responder funding.
SOURCE: New York University, Center for Catastrophe Preparedness and Response, 2005.

with many casualties is something that many hospitals have limited capacity to handle.

Much of the problem, though, is due to a simple lack of funding. In 2002, for example, hospital grants from the Bioterrorism Hospital Preparedness Program were typically between $5,000 and $10,000—not enough to equip even one critical care room. EMS is particularly underfunded. Although emergency service providers are a crucial part of the response to any disaster, they received only 4 percent of the $3.38 billion distributed by the Homeland Security Department for emergency preparedness in 2002 and 2003 and only 5 percent of the funding from the Bioterrorism Hospital Preparedness Program (Figure 2-2). In general, of the billions of federal dollars being spent on disaster preparedness, only a tiny fraction is spent on medical preparedness, and much of that is focused on one of the least likely threats—bioterrorism.

Due to this lack of funding, few hospital or EMS personnel have received even minimal training in how to prepare for and respond to a disaster. Furthermore, they lack the equipment and supplies necessary to deal with disasters. Few hospitals have negative-pressure units, for example, which are crucial in isolating victims of airborne diseases, such as avian flu. Nor do many hospitals have the appropriate personal protective equipment to keep their staffs safe when dealing with an epidemic or other disaster.

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Shortcomings in Pediatric Emergency Care

Children who are injured or ill have different medical needs than adults with the same problems. They have different normal values for pulse, respiratory, and blood pressure measures that change with age. They often need equipment that is smaller than what is used for adults, and they require medication in much more carefully calculated doses. They have special emotional needs as well, often reacting very differently to an injury or illness than adults do. Although children make up 27 percent of all visits to the ED, many hospitals and EMS agencies are not well equipped to handle these patients (Figure 2-3).

A report from the National Center for Health Statistics indicates, for example, that only 6 percent of U.S. EDs have all the supplies necessary for handling pediatric emergencies, and only about half of the departments had even 85 percent of the essential supplies. Training is also an issue. Many EDs, particularly those in rural areas, rely on doctors and nurses without specialized pediatric training to handle pediatric patients. Many EMS agencies require little pediatric training of their personnel.

A number of large cities do have children's hospitals or hospitals with pediatric EDs that offer state-of-the-art treatment for children. However, the vast majority of ED visits by children are made instead to general hospitals, which are less likely to have pediatric expertise, equipment, and policies in place for the care of children.

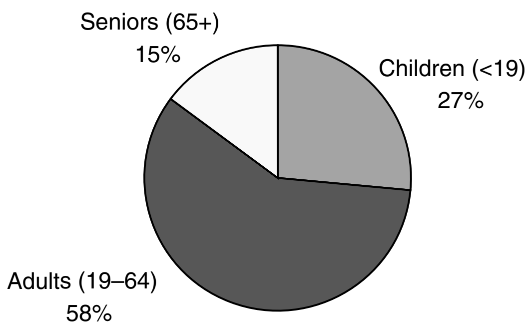

FIGURE 2-3. Emergency department visits by age.
SOURCE: 2002 NHAMCS, calculations by IOM staff.

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THE COMMITTEE'S RECOMMENDATIONS

To improve the nation's emergency care system and deal with the growing demands placed on it, the committee recommended a multipronged strategy. Its reports contain a large number of recommendations, and four key areas are highlighted below.

Creation of a Coordinated, Regionalized, Accountable System

Many of the problems of today's emergency care system can be traced to its fragmented nature. The emergency care system of the future should be, in contrast, highly coordinated, regionalized, and accountable. This is the centerpiece of the committee's vision for the future of emergency care.

It should be coordinated in the sense that, from the patient's point of view, delivery of emergency services should be seamless. To achieve this, the various components of the system—9-1-1 and dispatch, ambulances and EMS workers, hospital EDs and trauma centers, and the specialists supporting them—must be able to communicate continuously and coordinate their activities. When an ambulance picks up a patient, for example, the EMS personnel gather information on the patient, and the information is automatically passed on to the ED before the ambulance even arrives.

The system should be regionalized, in the sense that neighboring hospitals, EMS, and other agencies work together as a unit to provide emergency care to everyone in that region. Patients should be taken to the optimal facility in the region based on their condition and the distances involved. In case of a stroke, for example, a patient might be better served by going to a hospital that is slightly farther away but that specializes in the treatment of stroke.

Finally, the system should be accountable, which means that there must be ways of determining the performance of the different components of the systems and reporting that performance to the public. This will demand the development of well-defined standards and of ways to measure performance against those standards.

The reports call for a series of 10 demonstration sites to put these ideas into practice and test them to determine which strategies work best under various conditions.

Once under way, this coordinated, regionalized, and accountable system should not only address the problem of fragmentation of the nation's emergency care system, but it should also help the shortage of on-call specialists by routing patients to hospitals with the appropriate specialists. To further increase the availability of specialists in EDs, the report also calls on Congress to find a way to mitigate the effect of medical malpractice suits on services provided to patients in EDs.

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Furthermore, the development of a coordinated, regionalized, accountable emergency and trauma care system is hindered by the way that responsibility for emergency care programs is spread out across different agencies of the federal government. The scattered nature of federal responsibility for emergency care makes it difficult for the public to identify a clear point of contact, limits the visibility necessary to secure and maintain funding, creates overlaps and gaps in program funding, and engenders confusion on key policy issues. The report calls for the creation of a lead federal agency that would consolidate many of the government programs that deal with emergency and trauma care.

Improve Hospital Efficiency and Patient Flow

Tools developed from engineering and operations research have been successfully applied to a variety of businesses, from banking and airlines to manufacturing companies. These same tools have been shown to improve the flow of patients through hospitals, increasing the number of patients that can be treated while minimizing delays in their treatment and improving the quality of their care. For example, smoothing the peaks and valleys of patient admissions has the potential to eliminate bottlenecks, reduce crowding, improve patient care, and reduce cost. Another promising tool is the clinical decision unit, or 23-hour observation unit, which helps ED staff determine whether certain ED patients require admission. Hospitals should use these tools as a way of improving hospital efficiency and, in particular, reducing ED crowding.

At the same time, hospitals should increase their use of information technologies with such things as dashboard systems that track and coordinate patient flow and communications systems that enable ED physicians to link to patients' records or providers. Such increased use of information technologies will not only lead to greater hospital efficiency but will also increase safety and improve the quality of ED care.

Since there are few financial incentives for hospitals to reduce crowding, the Joint Commission on the Accreditation of Healthcare Organizations should put into place strong standards about ED crowding, boarding, and diversion. In particular, the practices of boarding and ambulance diversion should be eliminated except in the most extreme circumstances, such as a mass casualty in a community.

Increase Resources

Increased funding could help improve the nation's emergency care system in a number of ways. More research is needed, for example, to de-

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termine the best ways to organize the delivery of emergency care services, particularly prehospital EMS. And, given that many closings of hospitals and EDs can be attributed to financial losses caused by the cost of emergency and trauma care, Congress should consider providing greater reimbursements to the large, safety-net hospitals and trauma centers that bear a disproportionate amount of the cost of taking care of uninsured patients.

An area in which greater funding is needed is disaster preparedness. To date, despite their importance in any response to disaster, the various parts of the emergency care system have received very little of the funds that Congress has dispensed for disaster preparedness. In part this is because the money tends to be funneled through public safety agencies that consider medical care to be a low priority. Congress should therefore make significantly more disaster preparation funds available to the emergency system through dedicated funding.

Devote More Attention to the Care of Children

Finally, as these improvements are made to the nation's emergency care system, it will be important to keep pediatric patients in mind in all aspects of emergency care. The needs of pediatric patients should be taken into account in developing standards and protocols for triage and the transport of patients; in developing disaster plans; in training emergency care workers to ensure that they are competent and comfortable providing emergency care to children; and in conducting research to determine which treatments and strategies are most effective with children in various emergency situations.

ACHIEVING THE VISION

There is no "one size fits all" solution to building the best possible emergency care systems from state to state and region to region. In order to explore different approaches and see what works best in different situations, the committee recommends that Congress establish a 5-year demonstration program to provide funding for states or regions to develop coordinated, regionalized, and accountable emergency care systems in various parts of the country. Over time these projects will help identify best practices that can address the problems facing today's emergency systems and point the way toward a future emergency care system that ensures high-quality, efficient, and reliable care for all who need it.

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Workshop in Salt Lake City, Utah

The first dissemination workshop, held at Primary Children's Medical Center in Salt Lake City, Utah, focused on pediatric emergency care and care in rural areas. Edward Clark, medical director of Primary Children's Medical Center and the opening speaker, explained that Utah has the highest birth rate and the youngest population in the nation and that the state faces many of the emergency care challenges highlighted in the Institute of Medicine (IOM) reports. Primary Children's, one of 21 hospitals in the Intermountain Health Care System, is one of 42 children's hospitals in the nation and one of 11 children's hospitals with a level 1 trauma designation. The hospital serves as a pediatric center covering five states in the intermountain West, over 400,000 square miles. Its 34-bed pediatric intensive care unit (PICU), one of the largest in the country, is the only PICU between Denver and San Francisco. Because of the hospital's large catchment area, it receives approximately 1,500 patients by helicopter each year.

Following the opening remarks by Dr. Clark, three IOM committee members, Nels Sanddal, Brent Eastman, and Marianne Gausche-Hill, provided an overview of the findings and recommendations from the three IOM reports.

REACTIONS TO THE IOM REPORTS

Federal Perspectives

David Sundwall, director of the Utah Department of Health and IOM committee member, emphasized the importance of looking beyond the IOM

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reports and their recommendations to recognize and acknowledge the human side of pediatric emergency care. He described how the federal Emergency Medical Services for Children (EMS-C) program, like many other federal health care programs, had its origins in policy makers' personal medical experiences. Over 25 years ago, Dr. Sundwall's daughter was very seriously injured by an automobile. She received good emergency care and survived. Years later, when Dr. Sundwall was working in Washington, DC, for Senator Orrin Hatch, he met another congressional staff member who had a poor experience with the pediatric emergency care system. Together, they partnered to write the legislation that created the EMS-C program. Dr. Sundwall emphasized how pleased he was that his daughter's terrible injury translated into assistance for many other children. He noted that one of the IOM committee's recommendations was for Congress to increase the modest federal funding for the EMS-C program to $37.5 million. There continues to be enormous strains on the emergency care system nationwide, and the EMS-C program is well positioned to help address those challenges for children.

Another challenge facing the emergency care system is its ability to respond to disasters. According to John Agwunobi, assistant secretary for health in the U.S. Department of Health and Human Services (DHHS), one of the essential components of a prepared nation is the presence of a robust, well-funded, well-staffed, connected emergency care system. A community will be better prepared for disasters if it has resources (e.g., defibrillators, ventilators) in place, citizens who are trained in cardiopulmonary resuscitation and understand how to access the system, academics conducting research and developing training programs for health professionals, and communications systems that connect the various responders.

Adm. Agwunobi emphasized that it is not appropriate to rely entirely on the federal government to improve emergency preparedness. A truly robust emergency care system must be supported by communities. The average citizen needs to understand the capabilities of the emergency care system and the resources needed for the system to maintain operations. People also need to understand that we are all responsible for supporting the emergency medical system.

In the event of a large-scale disaster, such as pandemic influenza, Adm. Agwunobi explained, the system currently does not have all the personnel or the resources that would be needed to respond. That means that communities are going to have to rely on outside health professionals and laypersons to assist. The Medical Reserve Corps (MRC) is one available resource. The MRC consists of groups of volunteer physicians, nurses, dentists, emergency personnel, and others who come together on a volunteer basis to assist in the event of an emergency. They will be available to augment the local health care workforce in the event of a disaster, expanding

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the capacity of the local system. There are over 450 MRC units across the country and 10 in Utah.

Nonprofessional health care workers may also play an important role in preparedness. On September 11, 2001, non-health care professionals stood beside police, emergency medical services (EMS) personnel, and firefighters ready to save lives. Their response demonstrated that the public is willing to support the system. A community may be in a position to save many more lives if it embraces non-emergency-response personnel and trains them in the basic skills of emergency response. An example would be training individuals to care for friends and family members with influenza.

Another challenge is the lack of resources (ventilators, medications, etc.) available in the event of a disaster. The Health Resources and Services Administration (HRSA) has invested $2 billion in hospital preparedness in recent years. Initially the funding was targeted at building committees, developing hospital response plans, and forging partnerships. In subsequent years, the funding has been used to build connections between hospitals, develop common communication standards, and invest in shared assets, such as tele-help systems. Funding has also been used to enhance joint exercises and, in doing so, has helped ensure that hospitals partner with key organizations in their planning efforts. Today HRSA's funding is directed at the priorities identified by the states. The HRSA funding stream will continue in the future and is complementary to the billions of dollars spent by the Department of Homeland Security to address preparedness.

When attendees were invited to ask questions or make a comment, Frederick Blum, president of the American College of Emergency Physicians (ACEP), noted that one of the shortcomings of many preparedness plans is that they end with the delivery of patients to the emergency department (ED); rarely do plans include contingencies in case EDs are not fully functional during or after a disaster. Adm. Agwunobi agreed that as disaster plans are developed, greater consideration should be given to that issue. The focus must go beyond the treatment of patients to also consider the integration of patients back into the community, cleanup, and the rebuilding of homes.

Adm. Agwunobi noted that the emergency care system has come a long way over the past several decades. The system in place today would have made the country proud 50 years ago. However, today we recognize that much work is left to do. The process of preparing a nation does not occur overnight. It requires the diligent inventory of community assets, strengths, and the building of partnerships and a framework on which to prepare. It should be incremental and flexible. Some may ask, "When will we be prepared?" but preparedness has no end point. There will always be new threats and further improvements to be made.

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Regional Perspectives

A panel of state and local representatives participated in a conversation about the IOM reports based on questions set in advance of the workshop. The discussion was moderated by IOM committee member Brent Eastman, chief medical officer of ScrippsHealth. Respondents included Paul Patrick, director of EMS for the State of Utah; Janet Griffith Kastl, director of the Office of EMS and Trauma for the State of Washington; James Antinori, an emergency physician in Salt Lake City; Denise King, director of education at Parkview Community Hospital in Southern California; and Joseph Hansen, executive director of the Critical Illness and Trauma Foundation in Bozeman, Montana.

What Are the Key Messages of the IOM Reports?

Mr. Patrick identified several key messages from the three reports: the emergency care system is underfunded, more pediatric training is needed for all providers, crowding and boarding of patients in the ED must be reduced, and the emergency care system is fragmented and is seeking a stronger identity.

Ms. Griffith Kastl said that her primary excitement about the reports is their emphasis on a systems approach. The reports recognize the interdependent relationship between prehospital care, hospital-based care, and all the providers that deliver care in those environments.

Dr. Antinori and Ms. King noted that the key messages of the reports, particularly those related to the lack of funding for emergency care and ED crowding, were not surprising and have been discussed for years in the emergency physician and nursing communities. The importance of the reports lies in their ability to reach a large audience and to educate the public about the problems in the emergency care system. Dr. Antinori also noted that the problems in the emergency care system are getting worse; he hopes that the message reaching the public is that the emergency care system might not be there when needed, regardless of patients' level of income, education, or status in the community.

Mr. Hansen identified several key messages, first noting that EMS has traditionally lacked a strong identity. The reports call for a lead federal agency for emergency care to be created in DHHS. The reports also describe how EMS is underfunded and data are inadequate to measure the quality of care being provided. The National EMS Information System (NEMSIS) can serve as a model for improving EMS data collection. Finally, Mr. Hansen discussed the importance of the system for pediatric patients. The report calls for increases in funding for the federal EMS-C program.

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Are There Any Important Issues that the IOM Reports Missed?

Mr. Hansen expressed disappointment that most of the examples concerning EMS in the reports involved paramedics treating patients. There is a general assumption that advanced life support and paramedic care are required to provide quality care, but limited evidence supports that assumption.

Ms. King noted that although the IOM reports address the nursing workforce shortage, they do not include any concrete recommendations for a solution to the problem. The same is true of workplace safety. Ms. King and Dr. Antinori said that the geriatric population deserved more attention in the reports. Geriatric patients have a unique set of health problems and treatment options, and there will be a huge surge in that population over the next 20 years. They also agreed that while psychiatric patients do not require much clinical time, providers spend a disproportionate time on the disposition of those patients, an issue that was not adequately discussed in the reports.

Ms. Griffith Kastl and Mr. Patrick said that the reports did not discuss the role and responsibilities of state EMS and trauma agencies, noting that a successful regional system requires leadership at the state level. Ms. Griffith Kastl also noted a lack of discussion of prevention issues. Mr. Patrick added that although rural emergency care is mentioned, the reports generally appeared to be written from an urban perspective. Finally, he noted that the reports call for a federal lead agency for emergency care but do not give enough consideration to the Federal Interagency Committee on EMS (FICEMS), which could serve as a home for emergency care at the federal level.

What Are the Top Priority Areas for Action? What Are Some of the Barriers to Implementation?

Mr. Patrick identified the following priority areas for action: reimbursement for EMS treat and release under Medicare, a common scope of practice for EMS, a revision of the Health Insurance Portability and Accountability Act (HIPAA) laws for data collection, and increased funding for the EMS-C program. Barriers include a lack of coordination of EMS across state and territorial jurisdictional lines and a lack of funding for the coordination of efforts.

Ms. Griffith Kastl said that there must be funding devoted to systems development. Also, there should be stronger leadership at the federal level, which FICEMS may be able to provide. Another priority issue is to reduce crowding in EDs, and the reports provide many good ideas for doing so. Health care politics and individuals' resistance to change serve as barriers.

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Dr. Antinori said that personnel issues are among the top-priority areas for action. Even if the system adopts the best information technology or the best resources, it will make little difference if personnel are unavailable to treat patients. There must be more training of providers or strategies developed to retain providers, and that will require additional funding. It will also require addressing the liability problem. Dr. Antinori identified politics and money as the main barriers to action.

Ms. King spoke about different priorities at different levels: local, state, and federal. She counted 43 recommendations targeted to federal-level entities, noting that there is great potential for politics to serve as a barrier to implementation. For example, there may be turf battles between the federal agencies about who should lead emergency care. There may also be turf battles in the professional ranks among physicians, nurses, emergency medical technicians (EMTs), and firefighters about who takes the lead; it must be a collaborative effort, according to Ms. King. Hospital efficiency is another area for action, and she noted that there are many hospitals that are taking steps to improve efficiency. Some of the barriers to these efforts include HIPAA, the Emergency Medical Treatment and Active Labor Act, and nurse staffing ratios in California.

Open Discussion

Dr. Eastman invited members of the audience to ask a question or make a brief comment. Jerris Hedges from the Society for Academic Emergency Medicine raised the issue of workforce shortages in rural areas, noting the need to enhance training opportunities and expand the number of providers in rural areas. Mr. Sanddal agreed, noting that there should be some exploration of alternative training models for health care providers in rural areas, including the use of simulation training, which is discussed in the IOM reports. Donna Thomas, a member of the IOM committee, also added that more research is needed to determine the types of training that are most beneficial as well as the frequency of training needed for providers to maintain competencies.

Denise Love of the National Association of Health Data Organizations, noting the high utilization of EDs for preventable conditions and primary care, inquired whether the committee considered recommendations to fix the primary care system. Similarly, Jeff Schunk of Primary Children's Medical Center asked whether the committee considered universal health care during its deliberations. Dr. Gausche-Hill noted that consideration of universal coverage was beyond the scope of the committee's charge, but also that universal coverage may not address the high rates of ED utilization. In fact, several studies indicate that insured individuals also use the ED

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for nonurgent conditions and many also face barriers to accessing primary care.

Bill Jermyn, EMS medical director for the state of Missouri, noted that the IOM report on prehospital care did not focus much attention on the issue of patient safety. He added that state medical directors see patient safety as a significant problem, one that is of an unknown size due to a lack of data. Mr. Sanddal responded by saying that the committee focused on recommendations for building the infrastructure that would allow for the evaluation and monitoring of patient safety and quality. Tommy Loyacono, a member of the IOM committee, mentioned the need for EMS to develop a culture that encourages the reporting of errors.

Clay Mann, from the Intermountain Injury Control Research Center, spoke about the importance of research in emergency care and found it surprising that the reports did not contain a recommendation to provide financial support to states and hospitals for the collection of standardized data across regions, states, and the nation. Mr. Sanddal responded that the reports do contain some language about the need to standardize and collect data, but the committee did not issue a specific recommendation for financial support to states and hospitals for that purpose.

LeeAnn Phillips, a regional EMS director from New Mexico, noted that the committee did not address the issue of reimbursement for illegal immigrants. Members of the committee agreed that it is an important issue, but one that was not discussed in great detail by the committee.

Finally, Debra Wynkoop of Utah Hospitals and Health Systems Association and Dr. Blum raised the issue of specialty hospitals, noting that specialty hospitals are drawing paying patients and surgical specialists away from general hospitals. Dr. Gausche-Hill noted that specialty hospitals are briefly addressed in the hospital-based report. Certainly there will always be a need for general hospitals to have personnel available who are capable of at least stabilizing patients and transferring them to a higher level or specialty facility. It will be important to integrate specialty facilities into a regional system, making sure that the system is designed so that all patients have access to the specialty services they need.

LEADING CHANGE

Brent James, executive director of the Institute for Health Care Delivery Research, Intermountain Health Care, delivered the luncheon address and discussed health care quality and the need for providers to take an active role in improving emergency care.

Dr. James explained that the emergency care reports are the latest from the IOM that address quality issues in health care delivery. In 1999 the IOM released *To Err Is Human*, which created controversy because it provided

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a conservative estimate of the number of people who die each year from medical errors at hospitals. In 2001, the IOM released *Crossing the Quality Chasm*, which served as a prescription for reform. The title was drawn from the second paragraph of the executive summary, "Between the health care we have and the care we could have lies not just a gap, but a chasm." The IOM reports on the emergency care system draw similar conclusions.

The well-established literature on quality leads to three conclusions, according to Dr. James. First, there is great variation in clinical care delivery across the United States, and inappropriate care is common. There have been about 40,000 peer-reviewed articles documenting variation in care over the past 30 years. Jack Wennberg, the father of research on variation in care in Medicare, found that Medicare patients in Florida consume 2.5 times more resources than similar patients in Minnesota and that the patients in Florida have about a 2 percent higher mortality rate than their counterparts in Minnesota.

The second conclusion was highlighted in *To Err Is Human*. The authoring committee estimated that between 44,000 and 98,000 preventable deaths each year are directly associated with care delivered in hospitals. More recent analyses indicated that this was a conservative estimate. It includes only injuries of commission (in which care actively harmed the patient) in an inpatient setting. The estimate does not include injuries in the outpatient settings or injuries of omission (in which a treatment that is known to work was not administered), which is an even greater problem.

The final conclusion is that there is a striking inability to deliver care that is proven to be effective. One of the best illustrations of that literature comes from Beth McGlynn, who looked at injuries of omission and commission in six major metropolitan areas and found that American health care provides appropriate care about 54.9 percent of the time.

The literature on health care quality presents a picture of failure, and the IOM reports on emergency care provide even more evidence of failure. However, Dr. James argued that the conclusions about the health care system that one draws depend on one's perspective. It is important to look back and reflect on how far the health care system has advanced.

A very recent article in the *New England Journal of Medicine* assessed the value of medical spending in the United States. It showed that life expectancy has risen from 49 years for a child born in 1900 to 77 years for a child born in 2000, which represents a phenomenal success story. Prior to 1900, life expectancy was fairly constant, but around 1900, medical care became more organized and scientific methods were applied more systematically in delivery. Between 1900 and 1960, there was a 20-year gain in life expectancy or 3.5 years in each decade. Most of this gain was due to public health improvements and control of epidemic disease, and the trend has continued. Since 1960, there has been about 1.75 years of life expec-

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tancy gained per decade. According to Dr. James, medicine is "routinely achieving miracles," but we often overlook that progress. Depending on one's perspective, the health care system can be said to be failing or achieving miracles.

Dr. James added that IOM committees almost always address their recommendations to the U.S. Congress; however, most members of Congress have competing agendas and will not take time to understand the reports. The importance of the reports therefore stems from their careful analysis of major problems and their ability to reach the professionals who are actively providing care. Those involved in emergency care should look for ways to stimulate change from within, rather than wait for Congress to act. The most effective change almost always happens from within.

ADVANCING PEDIATRIC EMERGENCY CARE

The first afternoon session focused on pediatric emergency care. Four presentations were followed by an open discussion. The session was moderated by IOM committee member Marianne Gausche-Hill.

Pediatric EMS

Kathleen Brown, a pediatric emergency medicine physician at Children's National Medical Center, provided a summary of the IOM committee's recommendations that pertain to pediatric prehospital care and discussed implementation issues. In the area of training and skills maintenance, the IOM committee recommended that every health professional credentialing and certification body related to pediatric emergency care define pediatric emergency core competencies and require practitioners to receive the appropriate level of initial and continuing education necessary to achieve and maintain those competencies. There continues to be great variability in the pediatric training and continuing education that prehospital providers receive. Dr. Brown noted that the National Highway Traffic Safety Administration developed a prehospital model curriculum that includes pediatric components; however, there continues to be great variability in the extent to which the states follow the curriculum. States often use it as a guide but do not necessarily follow it faithfully. The EMS-C program encourages states to include pediatric training in the recertification process for EMTs. One of the program's performance measures tracks trends in pediatric education for paramedics.

The IOM committee also recommended that EMS agencies (as well as hospitals) appoint pediatric coordinators to provide pediatric leadership for the organization. Dr. Brown noted that there may be some incentives that the EMS-C state or regional coordinator can offer EMS agencies to

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encourage the appointment of pediatric coordinators. For example, the state might offer to provide an analysis of the agency's data or offer special training opportunities to staff. EMS-C coordinators may also be able to influence the state EMS directors to mandate pediatric coordinators at the agency level.

The IOM committee also recommended the development of evidence-based model pediatric protocols for pediatric prehospital care. The IOM committee recommended that these protocols be developed within 18 months, which, according to Dr. Brown, is very ambitious. However, the National Association of EMS Physicians developed model protocols for pediatrics that have been reviewed by a number of organizations, which can serve as a starting point. The EMS-C program, which provided support for the development of the model protocols, may decide to update those protocols.

Dr. Brown also discussed the IOM committee's recommendation that EMS agencies and hospitals adopt family-centered care into practice. There are a couple of important barriers to the adoption of family-centered care. The first is a fear on the part of providers, particularly when it comes to allowing family members to be present for certain procedures, of violating HIPAA, making themselves more vulnerable to lawsuits, or both. The other barrier has to do with resources and having the funding necessary to promote a family-centered environment. For example, it is costly for hospitals to remodel waiting rooms to make them more family-friendly and for hospitals and EMS agencies to have someone on staff specifically to provide support to families.

To address these barriers, Dr. Brown said that education is important, and there are several resources that providers can use to improve education. The National Association of EMTs developed guidelines for family-centered care in EMS, and the Emergency Nurses Association developed a handbook on how to institute family-centered care in the ED. The Ambulatory Pediatric Association, the Institute for Family Centered Care, and the American Hospital Society also have resources that could be of use to emergency providers. Providers also must educate those with resources on importance of family-centered care in order to make the implementation of family-centered care a priority in EMS agencies and hospitals.

Patient Safety

Karen Frush of Duke University Health System spoke on patient safety. Emergency care is provided in a high-risk and highly complex environment in which providers are at risk of making errors every day. Although other industries, such as aviation and nuclear power, face similar levels of risk, those industries have implemented systems and processes to mitigate risk

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and improve safety. In fact, according to Dr. Frush, these high-reliability organizations have incredible safety records. Although more research is needed on the subject of patient safety in the emergency care setting, there are steps that federal agencies, EMS agencies, and hospitals can undertake immediately to improve safety.

To reduce errors in the administration of medication to children, according to Dr. Frush, a clinical tool should be developed to help emergency care providers standardize and simplify dosing. Currently a length-based measurement tape is available to assist with dosing, and although it has some limitations, it can serve as a prototype. Dr. Frush said that a panel of experts—providers, manufacturers, pharmacists, and vendors—should be convened to develop medication standards for pediatric patients. That group can define ideal standards based on the currently available evidence, recognizing that more research and evidence will be used to refine the standards in the future. The issue of dosing extends to other forms of treatment as well, including radiation. At least one vendor has designed a computed tomography (CT) scanner that can be adjusted for dosing. Once a standard for pediatrics is available, providers can appropriately dose the amount of radiation to which patients are exposed.

Dr. Frush also discussed several steps that hospitals and EMS agencies can undertake in order to implement evidence-based approaches for reducing errors and improving patient safety more generally. First, providers need to assess risk in their environments. If providers understand that they work in a high-risk environment, then they will recognize that it is their responsibility to reduce risk as much as possible. Provider organizations can also adopt strategies of active surveillance. There are programs currently available in which safety teams examine the clinical area in the ED and ask providers on the front line about risks that might harm patients. It is important to identify these risks so that changes can be made. In addition, there should be voluntary reporting systems available in every ED so that all providers, patients, and families can let administrators know about concerns they have related to risk.

Another opportunity is for providers and families to share stories. Federal legislation was passed to allow provider organizations to form patient safety organizations. Dr. Frush noted that a national patient safety organization for pediatric emergency care is needed to allow providers to submit stories and share lessons learned.

Teamwork among providers is also important to reducing medical errors; however, health care providers are not typically trained in teamwork. Reflecting on her own nursing and physician training, Dr. Frush noted that she was trained "in a silo," but was then sent into the clinical area and expected to function as part of a team. This remains true under the current education systems for EMTs, nurses, and physicians. The didactic

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and interactive training currently available can improve providers' ability to communicate and work as members of a team. There are also consultants that will come to health care organizations to facilitate teamwork. Team training is beginning to be implemented in some medical and nursing schools, and it is important to assess which methods work best and move toward implementing those models.

Finally, Dr. Frush noted that providers need to include the family when they take care of children in the emergency department. Health care providers need further training on how to say, "I'm sorry" and to disclose appropriately to patients and families when medical errors occur. If, as the IOM committee recommended, patients and family members should be integrated into the care team, providers need to learn how to communicate these messages.

Research

Although there have been tremendous strides in pediatric emergency care in previous decades, many gaps remain and pediatric research continues to lag behind adult research. According to Nathan Kuppermann, chair and director of research in the Department of Emergency Medicine at the University of California, Davis, School of Medicine, compared with adults, much less is known about treatment of life-threatening pediatric injuries and illnesses, such as cardiac arrest, shock, and drowning. More information is also needed to assess pediatric emergency care on the IOM's six aims of quality health care: safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity.

In order to address these gaps in knowledge, several barriers must be overcome in addition to the limited funding available for research. The first is the limited number of individuals trained in pediatric emergency care research and limited protected time for researchers. Dr. Kuppermann explained that often investigators are under such tremendous pressure to achieve clinical productivity that little time is left for research. The epidemiology of pediatric emergency events poses another barrier. Important events occur at any given hospital only sporadically. To study certain conditions, researchers need to pool data to obtain sufficient diversity to generate findings that are generalizable. The complexity of obtaining informed consent in the ED serves as another barrier. Finally, the lack of an appropriate infrastructure prevents research collaboration between prehospital and hospital providers.

Dr. Kuppermann emphasized the need to expand multicenter research, in which data from a number of hospitals are pooled to improve sample size. Multicenter research promotes collaboration among investigators from different organizations and with different clinical backgrounds (e.g., pre-

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hospital providers, critical care physicians, ED physicians and nurses). The capabilities of multicenter research should also be investigated for their ability to transfer research results into the practitioner community. An example of a multicenter research network is the Pediatric Emergency Care Applied Research Network, which is funded by the EMS-C program of the Maternal and Child Health Bureau at HRSA. It is the first federally funded research network focused on pediatric emergency care.

The challenge is that, while multicenter research networks can produce definitive findings, the studies are expensive. Investigators need to educate and make the case to Congress for funding and a dedicated institute within the National Institutes of Health, according to Dr. Kuppermann. Another challenge is that the sharing of information is complicated in a multicenter research network because of the institutional review board (IRB) process. Each institution has its own IRB with different guidelines. In order to address this challenge, there should be better collaboration among IRBs regarding the interpretation of federal regulations, and perhaps federal policy makers also need to revisit federal regulations regarding the sharing of data for research purposes. One possibility is to create a single, centralized IRB for an entire research network.

The generalizability of findings from multicenter networks is another challenge. Most research is conducted at pediatric centers; however, more than 90 percent of pediatric emergency care is provided at general hospitals. There is a need to incorporate general hospitals into research. It is important to train community practitioners in some basic research principles and give incentives to hospitals to participate in multicenter research.

Workforce

Emergency care providers are expected to deliver appropriate care to all types of patients, including children, adults, seniors, pregnant women, among others. However, according to Jeff Schunk, professor in the Department of Pediatrics, University of Utah School of Medicine, it is a tremendous challenge for providers to have the competencies to care for all types of patients. There are particular challenges associated with the care of children because of their unique anatomical, physiological, developmental, and emotional differences in comparison to adults.

Pediatric training makes up about 15 to 16 percent of residency time in emergency medicine training programs. However, only about 38 percent of the practicing ED physicians are trained and board-certified in emergency medicine. Only 3 percent of ED physicians are residency trained or board-certified in pediatrics. Other emergency physicians are trained in such areas as family practice or internal medicine and are likely to receive relatively

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little formal training in pediatrics or pediatric emergency care, according to Dr. Schunk.

Dr. Schunk added that there are training challenges in nursing, as well. For example, ED nurses tend to be less experienced than nurses who work in other health care settings. More experienced nurses often select positions that do not involve working the long hours or evenings that may be required in the ED. Also, while nurses have the option of becoming a certified emergency nurse (CEN), there is no mandate for the additional training or certification. As a result, there were only 13,000 CENs in 2003. Some hospitals require nurses to take pediatric training, such as pediatric advanced life support or advanced pediatric life support courses, but many do not.

Another challenge related to the pediatric competencies of emergency providers is maintaining pediatric skills after training. Some providers rarely see critically ill or injured children. A study in Los Angeles County found that it would take roughly 20 years for every provider to be exposed to important life-threatening skills if they waited for on-the-job training. In the absence of regular exposure to critically ill children or continuing pediatric education, pediatric skill levels deteriorate. More research should be conducted on when and how skills deteriorate and techniques that can be used to maintain those skills, according to Dr. Schunk.

As a result of these challenges, the IOM committee recommended that every health professional credentialing and certification body related to pediatric emergency care define pediatric emergency core competencies and require practitioners to receive the appropriate level of initial and continuing education necessary to achieve and maintain those competencies. This recommendation is a first step toward the creation of core competencies that are essential for emergency care providers at different levels. According to Dr. Schunk, there are no significant fiscal barriers for enacting this recommendation. Implementation will require focus and energy from certification bodies and a recognition that creating core competencies is important.

The committee also recommended that the DHHS collaborate with professional organizations to convene a panel of individuals with multidisciplinary expertise to develop, evaluate, and update pediatric emergency care clinical practice guidelines and standards of care. Previous research has shown high variability in management of the common pediatric conditions, including croup, fever, bronchiolitis, febrile seizures, sedation, even within an institution. The purpose of this recommendation is to eliminate that variability. However, Dr. Schunk noted that eliminating variability in care has not been a priority for physicians. Even when faced with evidence that their current practice is not optimal, it is difficult to get physicians to change their care behavior. Clinical guidelines are known to assist in decision making; however, in a review of 1,000 guidelines, only 15 applied to pediatric emergency care. It is up to practitioners to overcome some of the

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historical problems with trying to standardize practice, recognizing that providers will not lose their identity by, for example, using the same antibiotics for otitis media or if they agree on whether steroids should be used in bronchiolitis or not.

Open Discussion

During the open discussion period, Robert Bolte from Primary Children's Medical Center echoed earlier comments that the lack of universal health care is at the root of many problems facing the emergency care system. Mr. Sanddal once again noted that addressing universal coverage was beyond the scope of the committee's charge. Dr. Bolte also noted that the Office of Management and Budget recently reviewed the EMS-C program and gave it a mediocre evaluation at best. He asked about strategies for addressing the evaluation and pushing for increased funding for the program. Dr. Gausche-Hill responded by saying that the evaluation was critical because the program could not demonstrate measurable improvements in the outcomes of pediatric emergency care that could be attributed specifically to the program. Certainly, injury and death rates have declined in recent years, and although the EMS-C program has developed many important products and can demonstrate changes at the state level, a direct link between program activities and patient outcomes will be difficult to prove.

Dr. Hedges noted that one of the biggest hurdles to conducting research on resuscitation is getting IRB approval using the mandate of the Food and Drug Administration (FDA) for community notification and consultation. He described the process as very laborious, and it may even get worse in the future. The FDA will be holding hearings to look at how they might standardize the community notification and consultation process. In his view, the FDA needs to hear about how important research is in the prehospital environment and understand that some of the barriers are impairing the ability to discern what treatments are best. The afternoon presenters, including Dr. Kuppermann and Dr. Brown, agreed with the comment, noting the importance of addressing this issue quickly. Dr. Brown added that she is involved in a study that was requested by the federal government, yet it still took three years to clear the IRB process.

EMERGENCY CARE IN RURAL AREAS

The second afternoon session focused on emergency care in rural areas. Four presentations were followed by an open discussion. The session was moderated by Nels Sanddal, IOM committee member and chair of the workshop planning group.

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ED Physician Perspective

Frederick Blum, an emergency physician practicing in West Virginia and president of the ACEP, identified problems concerning emergency care in rural areas, noting that many of the problems stem from the same challenges that affect emergency care in urban and suburban areas.

First, he discussed the prevalence of ED crowding and ambulance diversion. In urban areas, ED crowding and ambulance diversions are commonplace. Patients have difficulty getting into the ED, and they have difficulty getting transferred to an inpatient unit or discharged to another facility. In rural areas, ED crowding is generally not a problem. Although patients can access ED care relatively quickly, once at the ED, they experience similar problems with transfer and discharge as patients in urban areas. One of the complicating factors in rural areas is that many rural hospitals have closed or have converted to Critical Access Hospitals with limited inpatient capacity. In addition, some rural facilities do not accept pediatric inpatients, making it very difficult to quickly place such patients.

Ambulance diversion in rural areas is uncommon simply because there are typically no other facilities to send diverted ambulances. However, ambulances in rural areas face the challenge of transporting patients across great distances; this is one of the problems associated with regionalized care. Patients are transported out of their service areas and, as a result, ambulances are out of commission for long periods of time. For volunteer squads, this presents a major problem, since there may not be another ambulance on duty to respond to incoming calls when the local ambulance is several hours away.

The second priority area is reimbursement. According to Dr. Blum, ED physicians and nurses are the only source of health care for millions of Americans. Inadequate reimbursement for emergency care places the safety net at great risk. Dr. Blum noted that a 5 percent cut is scheduled for physician reimbursement under Medicare in each of the next six years. Not only does the reduction in reimbursement hurt ED physicians, but it may also increase their workload if other physicians disenroll patients from their practices because of the pay cut.

A related financial concern is professional liability. While access to specialists is a problem in many parts of the country, the problem is even more acute in rural areas. A few years ago in West Virginia, no insurers would write policies for specialists to provide services in the ED at any price. The state lost virtually all specialty surgeons, including every private neurosurgeon. Surgeons in the state went on strike, the state legislature took action, and the surgeons are beginning to return to practice in the state.

Dr. Blum also noted workforce issues as a priority issue for rural areas. In order to increase the emergency medicine workforce in rural areas, Dr.

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Blum argued that there needs to be increased training in rural areas. Until a few years ago, the entire north central part of the United States lacked an emergency medicine residency program. In recent years, programs were started in Utah, Nebraska, and Iowa. However, there continues to be a gap in the coverage of residency training programs in the country. Speaking of his experience in West Virginia, Dr. Blum noted that when residents are trained in rural areas, they tend to stay in rural areas.

In order to address these challenges, he spoke of the need for providers to engage in advocacy efforts, either by directly contacting policy makers or by supporting political action committees through their professional organizations.

Subspecialty Care in Rural Areas

Richard Ellenbogen, an adult and pediatric neurosurgeon, spoke about subspecialty care in rural areas, with a focus on neurosurgery. Dr. Ellenbogen practices at Harborview Medical Center and Children's Hospital in Seattle, Washington. Children's Hospital is the only pediatric level 1 trauma center in five states, covering the populations of Washington, Wyoming, Alaska, Montana, and Idaho. Those five states cover 25 percent of the land mass in the United States but only 8 percent of the population. The state of emergency care across this region, according to Dr. Ellenbogen, is relatively strong simply because the states have been very organized, particularly in comparison to the other parts of the country.

The need for neurosurgeons at the two hospitals is great. In the Northwest, 20 percent of the severe injuries and 50 percent of deaths have a head or spine component. To provide an overview of the types of cases seen by a neurosurgeon in a rural referral system, Dr. Ellenbogen gave an overview of 100 consecutive ED patients arriving at the two hospitals in which he works. Patients included 25 operative trauma patients, 19 nonoperative head and spine cases, 14 broken shunts, 12 tumors, 12 hemorrhages, 5 infections, 5 postoperative cases, 5 cerebrospinal fluid leaks, and 3 miscellaneous consults. Dr. Ellenbogen emphasized that although the IOM reports focused on trauma care, neurosurgeons also provide a great deal of generalized specialty care in the ED because specialists are in short supply in rural areas.

A recent survey by the American Association of Neurological Surgeons found that over 93 percent of responding neurosurgeons take ED call (i.e., are available on call); 85 percent of respondents said that they were required to do so. And 50 percent of respondents who take ED call said that they did not receive a monetary stipend for doing so. The survey also asked respondents whether they limited their practice. Liability was the overriding concern of physicians who limited their practice.

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Dr. Ellenbogen highlighted three challenges associated with the availability of specialty care. First, there are simply not enough board-certified neurosurgeons to cover all EDs at all times. Second, specialists rely heavily on nurses and nurse practitioners to handle their caseload; however, the nursing shortage is making that difficult. And third, the cost of maintaining subspecialists in rural areas is extraordinary. To set up a neurosurgical or orthopedic center in a rural hospital costs millions of dollars because of the equipment and technology needed.

Dr. Ellenbogen emphasized the need for regionalization and the use of telemedicine to improve the accessibility of subspecialty care in rural areas. Not all hospitals can or should be providing subspecialty care. There should be clear lines of transport so that patients are directed to the most appropriate facilities for their conditions. Implementing regionalization will be difficult because hospitals view specialty services as profitable lines of business. Reflecting on his practice in the military, Dr. Ellenbogen also noted the importance of telemedicine to access expertise when a neurosurgeon is not available nearby. However, there must be improvements in the standardization of CTs and magnetic resonance imaging. Currently it is impossible to transfer images from one hospital to another.

The Perspective of a State EMS Official

Dia Gainor, chief of the Emergency Medical Services Bureau for the Idaho Department of Health and Welfare, spoke about the roles of state EMS agencies and their capacity to introduce change to improve EMS and related emergency health care systems. Ms. Gainor argued that state agencies serve as the locus for EMS system change, and that state EMS agencies are accustomed to and comfortable with the various federal agencies and FICEMS to provide leadership in EMS.

Every state and U.S. territory has a lead EMS agency that has been studying the federal EMS standards for the past 30 years and has received EMS-C funding and trauma program funding. One of the goals of state EMS agencies is to implement change in the manner and order that is most logical, necessary, and achievable. Consistency is created wherever and whenever possible. EMS system development through state EMS agencies is similar to the model used for law enforcement. With federal inspiration, state police organizations and local law enforcement implement and support local programs.

Ms. Gainor emphasized that a federalized EMS system in the United States would not be appropriate. Individuals at the state level who conduct system assessments and capacity evaluations are in the best positions to make determinations about system priorities and improvement initiatives.

One of the troubling trends in EMS is that, although many rural sys-

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tems rely almost entirely on volunteer personnel, a diminishing number of individuals is willing to volunteer. It is the state EMS agencies' responsibility to track these trends and monitor turnover. At the state level, the EMS offices can evaluate those trends and identify whether the system is at a crisis point. State systems also ensure that rural areas of the state receive due consideration in the distribution of resources and funding. In addition, states play an important role in data collection and research. Ms. Gainor emphasized the importance of NEMSIS, an effort to create a national EMS database. Standards for the system have been selected, and many states are already contributing data; many others are prepared to participate in the next few years.

State Rural Health Office

Chris Tilden from the Office of Local and Rural Health in the Kansas Department of Health and Environment spoke about rural EMS and its position in the safety net. He also discussed several areas of concern for rural EMS.

Dr. Tilden commented on the IOM committee's recommendation for states to accept national certification as a prerequisite for state licensure and local credentialing. Although it is a goal that should be pursued, challenges lie ahead. For example, the national registry implemented computer-adapted testing, but there are only two testing sites in the state of Kansas. Dr. Tilden expressed concerns about declining access for local EMS providers who may not want to travel to the testing site. The state is considering the development of an alternative testing model, and a number of other states are looking in that direction as well.

Reimbursement issues are also critical in rural areas. Currently Medicare will not reimburse for prehospital services unless transport is provided. For rural areas, this is a harmful policy because they receive a relatively low volume of calls. Dr. Tilden emphasized the need to develop a system that takes into account the costs associated with readiness and allows for payment without transport. Consideration should also be given to ways that EMS agencies in frontier counties can develop additional capacities to provide preventive and primary care services. There have been a number of short-lived but successful models in the United States and Canada.

Dr. Tilden also discussed the federal Rural Hospital Flexibility Program, which allows cost-based reimbursement for critical access hospitals and EMS providers so long as they are 35 miles from another facility. Recently the program loosened the restrictions on cost-based reimbursement for critical access hospitals, but the 35-mile provision for EMS remains in effect. There is support in Congress to loosen the restrictions on EMS, and doing so would help support the costs associated with readiness.

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Information technology in EMS is critical, but EMS is often left out of national discussions on information technology. For example, the Universal Service Fund provides access to broadband services at affordable prices to rural health care providers, but not to EMS. However, last year the Office of the National Coordinator for Health Information Technology at DHHS began to recognize and speak about EMS issues related to information and communications technology.

The last issue Dr. Tilden discussed is community assessment and planning, noting that it is very important to work toward integration and regionalization. The communities are ultimately going to make the decisions about the types of care to provide, and they need to be given the tools to make informed decisions. Health care organizations and the Critical Illness and Trauma Foundation have been instrumental in developing tools to aid in those decisions.

Dr. Tilden emphasized that emergency care stakeholders need to engage their state offices of rural health so that the offices learn more about EMS. The state offices are charged with helping develop rural EMS networks, but there are offices that do not know much about EMS. In addition, provided that the EMS Trauma Program is reauthorized, Dr. Tilden discussed the need for the Rural and EMS Trauma Technical Assistance Center to be refunded to work with state offices of rural health and promote EMS activity at the state level.

Open Discussion

Several members of the audience made comments or raised questions about the rural workforce. Ms. Gainor noted that historically states have not adequately tracked the rural workforce challenges associated with EMS; however, some states are beginning to track workforce issues more closely. As an example, in Iowa, the state is surveying every individual who does not renew his or her state EMS credentials to find out why. Mr. Sanddal added that a study on the EMS workforce, funded by the National Highway Traffic Safety Administration, is currently under way. The study will identify whether there is a broad shortage of EMS personnel or whether there are maldistributions in labor that must be addressed.

A question was raised about the training of the emergency care workforce and whether there have been any lessons learned about having providers from urban areas conduct training in smaller communities. Mr. Sanddal noted that in the prehospital environment, common wisdom used to be that if training was brought to the rural area, attendance and participation would be greater and instructors would be inclined to return to provide additional training. However, over time, it has become clearer that many rural providers are interested in traveling to the larger communities for their

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training for social and other reasons. In addition, rural providers tend to prefer to reserve their evenings and weekends for family and use vacation time to receive training during the week. There needs to be more creativity in strategies for meeting the training needs of rural providers.

Dr. Blum noted the importance of being respectful in the way the rural workforce is described and addressed. Special interest groups often emphasize deficiencies of the rural workforce in terms of their ability to care for certain types of patients, for example, children or trauma victims. The rural workforce has close connections to the community and needs to be viewed as a partner rather than providers that need to be "saved from themselves."

Thomas Foley from the American College of Surgeons' Rural Trauma Committee described the Rural Trauma Development Course, which brings together all providers who care for trauma victims in a rural community, including prehospital providers, and provides direction on how to manage care during "the golden hour," the 60 minutes after the occurrence of trauma during which a victim's chances of survival with definitive care are greatest. The course is taught by instructors from an urban trauma center. Experience from the course has shown that participants from both the community hospitals and the trauma centers develop a sense of understanding and camaraderie, and it has worked to foster the relationship between the two groups.

CLOSING

Mr. Sanddal closed the workshop, thanking the panelists and attendees for their participation. He acknowledged that some differences of opinion exist concerning a few of the IOM committee's recommendations; however, there are many more areas of agreement. He encouraged the workshop attendees to move forward collectively to push for change in those areas of common agreement.

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Workshop in Chicago, Illinois

The second dissemination workshop focused on the issues of workforce and hospital efficiency. The workshop began with remarks from Eric Whitaker, director of the Illinois Department of Public Health. He discussed the complexities of the emergency medical services (EMS) system in Illinois, noting that the state has 11 EMS systems and as many as 60 EMS medical directors. Of great concern is the lack of standardization of EMS practice from one region to the next. Problems in the EMS system came to light in Chicago during a summer heat crisis in 1995, when there were 465 heat-related deaths in the city. During that summer, 23 of 42 hospitals went on diversion, emergency department (ED) wait times exceeded 12 hours, and it took some ambulances more than 30 minutes to reach patients. The immense demand on system resources created difficulty in responding to all patients, not just those with heat-related emergencies.

Dr. Whitaker noted that because EMS tends to be a local issue, local politics is a challenge to reform. Because of the political challenges, federal guidance is needed to lead states in the right direction. Dr. Whitaker encouraged federal agencies to coordinate their efforts so that activities at the state and local levels can also be better coordinated.

REACTIONS TO THE IOM REPORTS

Regional Perspectives

After three Institute of Medicine (IOM) committee members—Brent Eastman, Nels Sanddal, and Joseph Wright—provided a summary of the

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findings and recommendations from the IOM reports, a panel of state and local representatives participated in a conversation about the reports based on a series of questions set in advance. The discussion was moderated by Dr. Eastman, chief medical officer of ScrippsHealth. Respondents included Leslee Stein-Spencer, former chief of EMS for Illinois and current policy advisor for the National Association of State EMS Officials; Bill Jermyn, EMS medical director for the state of Missouri; Stephen Hargarten, chair of emergency medicine at the Medical College of Wisconsin and director of the Injury Research Center; Thomas Esposito, trauma surgeon from Loyola University Medical Center; and Peter Butler, executive vice president and chief operating officer at Rush University Medical Center.

What Are the Key Messages of the IOM Reports?

Ms. Stein-Spencer identified several key messages of the report. First, she noted that the reports identified EMS as an important component of the health care system; one that should be elevated in importance. Second, ED crowding, boarding, and diversion are major system-wide problems. Third, there is a great need for improved coordination among federal, state, local, and regional levels across the various system components, including EMS, hospitals, public health, and trauma. Fourth, due to a lack of research on emergency care, we lack the ability to determine whether many interventions are making a difference for patients. Fifth, there is a need to identify facilities that are prepared to properly handle pediatric patients. Finally, disaster preparedness involves not only police and fire but also EMS and hospitals. More training, funding, and equipment are needed to improve the medical response to disasters.

Dr. Jermyn added two key messages, the first being the IOM committee's recommendation to develop a coordinated, regionalized, and accountable emergency care system. Second, there is a need to "break down silos" between different components of the emergency care system.

Dr. Esposito and Dr. Hargarten agreed with the key messages mentioned by the previous speakers. Dr. Hargarten added that the key messages from the reports are nested in their respective titles: *Emergency Medical Services at the Crossroads*; *Hospital-Based Emergency Care: At the Breaking Point*; and *Emergency Care for Children: Growing Pains*.

Mr. Butler identified two other key messages. First, the problems in the emergency care system (e.g., uncertain quality, fragmentation among providers, millions without health insurance, and the need for information technology) are a microcosm of the broader problems in the health care system. Second, providers can address some of the problems, but tackling them will require leadership. The hospital community must take responsibility for addressing some of the system issues that are being discussed.

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Are There Any Important Points that the IOM Reports Missed?

Mr. Butler noted that the reports do not discuss how wildly successful EDs have been. The reports could have highlighted examples of best practices or case studies to describe what hospitals are doing well, rather than focus on shortcomings. He also noted that hospitals strive for high rankings in service lines, such as cardiac or cancer care; however, hospital quality is largely dependent on how well the functional areas, such as EDs, operating rooms, and intensive care units, perform. The reports should have emphasized the need for senior management to spend more time addressing quality issues in the functional areas of hospitals.

Dr. Esposito emphasized the need to consider the continuum of the health care encounter. A patient today may need rehabilitation services or end-of-life care several weeks or months in the future. Also, although the reports discuss the challenge of meeting the demand for emergency care, there is little discussion of the appropriateness of the care demanded. Does every child who falls off of a bicycle without a helmet need to go to the ED? Greater attention should be given to the cultural and legal perceptions of what services are needed under different circumstances.

Dr. Hargarten said that the IOM committee appropriately used the trauma model for their vision of a coordinated, regionalized, and accountable system; however, the reports could have described the emerging acute care systems for cardiac care, stroke care, toxicology care, and sepsis care, which are similar systems. He added that we should learn from leaders in pediatric emergency medicine, who have appropriately positioned the concerns of children with regard to emergency care, and develop a similar focus for geriatric care. In addition, Dr. Hargarten said that emergency care stakeholders need to develop a common, unified language when speaking about emergency care, trauma, and injury prevention and control to deliver a common message to policy makers. The reports fell short of developing a common language or a single message. Finally, Dr. Hargarten spoke about movement in the National Institutes of Health (NIH) toward translational research and the development of clinical translational science awards, which will be housed in approximately 60 centers across the United States. He expressed concern that the reports did not explicitly state that some of those centers should focus on translational emergency care research.

Dr. Jermyn noted that one of the shortcomings of the reports is that they did not simplify the very complicated emergency care system into a straightforward model that legislators and the public can easily understand. Ms. Stein-Spencer added that the IOM committee should have devoted more attention in the reports to the National Emergency Medical Services Information System (NEMSIS). NEMSIS is collecting standardized data from states and will serve as a repository for information that can help

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advance EMS research and EMS performance measures. She also noted that the report's call for a single lead agency for emergency care at the federal level lacked an appropriate level of discussion and analysis about the problems that currently exist from having multiple agencies involved in emergency care at the federal level.

What Are the Top Priority Areas for Action, and What Can Be Done to Address Those Areas?

Ms. Stein-Spencer said that the top priority is figuring out how to generate and sustain funding for EMS systems. One way to address this is to make states accountable for the money that they receive from the Health Resources and Services Administration, the Centers for Disease Control and Prevention, and other federal agencies. There should be better oversight of how the funding is spent. Another top area for action is to address the workforce shortages in order to improve surge capacity. Disaster preparedness plans often call for the creation of alternative health care facilities, but they fail to consider the fact that the workforce is often too limited to staff even traditional health care facilities.

Dr. Jermyn also discussed the issue of funding, noting that emergency care is an essential public service, but it is not funded at a level comparable to police or fire services. Unlike the other two services, emergency care is funded when EMS transport is provided or when treatment is provided in the ED. An unintended consequence of this reimbursement system is that there is little surge capacity. Hospitals are encouraged to be efficient and, as a result, have limited bed vacancies. A change in the reimbursement structure is needed in order to address system preparedness.

In the short term, Dr. Hargarten said that there must be a common language and vision for the emergency care system that can be easily conveyed to Congress in order for stakeholders to better advocate for change. In the long term, universal health insurance is needed. The growth of emergency care in previous decades is largely the result of poor access to primary and acute care. In the absence of universal health insurance, all other initiatives are simply Band-Aids on a larger problem.

Dr. Esposito described results from a Harris poll cosponsored by the Coalition for American Trauma Care, the American Association for the Surgery of Trauma, and other surgical organizations. Once the respondents realized that not all hospitals are capable of providing high-level trauma care, and that trauma centers cannot be found in all communities, they said that they would be willing to pay for improved access to those services.

Dr. Esposito also agreed that the workforce shortages must be addressed, perhaps by offering loan forgiveness programs or other incentives to emergency care providers. Similar to the point made by Ms. Stein-

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Spencer, Dr. Esposito emphasized the need for states and hospitals to be held accountable for the public funding that they receive. Also, states and hospitals should be given greater direction on how to use the funding, perhaps through a technical advisory center.

Mr. Butler downplayed the importance of funding, noting that even with increased resources, there are things providers must do to address the problems identified in the report. He noted that, like many hospitals across the country, Rush University Medical Center is building a new ED that is twice the size of the current one and will be equipped with negative-pressure rooms and other resources needed in the event of a disaster. As hospitals invest in these new facilities, it is imperative that they think through the needs of the community. Once the structure is built, it is very difficult to make further changes.

Mr. Butler ended the session by noting that no matter how long people wait in the ED, or how difficult registration is, or whether quality is compromised, the public continues to return to the ED, and they are doing so in increasing numbers. ED care is the most successful service line for hospitals in terms of demand for care. "Imagine what it would be like if we could get it right!"

Open Discussion

Members of the audience were invited to make a brief comment or pose a question to the IOM committee members in attendance. Many of the questions and comments concerned how stakeholders can get the attention of policy makers and advance some of the IOM committee's recommendations. Frederick Blum, president of the American College of Emergency Physicians (ACEP), described ACEP's media and advocacy efforts over the previous year and asked what the next steps should be. Steven Krug from Children's Memorial Hospital noted that the majority of the IOM committee's recommendations are targeted to the federal level and will require congressional action. He asked what could be done collectively to encourage action on the top-down recommendations. Sonny Saggar, president of the U.S. Alliance of Emergency Medicine, raised a similar question about how to convey the messages from the IOM reports to the public and Congress in language they will understand.

In response to these questions, Mr. Sanddal noted that, with the upcoming election, it is unclear whether there will be a new set of congressional leaders in one or both houses. If there is a transition, it may provide some opportunities for advocacy that emergency care stakeholders should leverage. Brent Asplin of Regions Hospital also noted that emergency providers have stories to share with policy makers that are very compelling. As for advocacy, he recommended that stakeholders try to advance a nonpartisan

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recommendation—specifically, the demonstration program. While a demonstration project is not necessarily going to change the face of emergency care immediately, it is something that could pass and lead to better information on emergency care systems in the future. Dr. Wright added that, while providers do not want to scare the public, people need to be educated on the issues. He works two miles from the Pentagon and in presentations uses a picture of the Pentagon burning during September 11 to discuss what would have happened if the Pentagon was full of children. He encouraged attendees to provoke public thought and action. He also discussed the power of the print media. A couple of weeks ago, on a Sunday, there was an op-ed piece published in the *Washington Post* on the emergency care system. He said that many people outside his profession approached him about the article.

Todd Allen, an emergency physician from LDS Hospital in Salt Lake City, observed that many different emergency care organizations have reacted to the IOM reports, each with its own agenda. He added that if a coordinated, integrated, and unfragmented emergency care system is the goal, then coordinated, integrated, and unfragmented leadership is needed to drive that process.

Dan Hermes, a fire chief representing the Illinois Fire Chiefs and the International Fire Chiefs EMS section, described the experience of the fire chiefs in their efforts to influence policy makers. In the past, there were many stakeholders in the fire community who "worked in silos" and advocated to policy makers for their own issues with limited success. Legislators told the advocates to return with a clearer message, so the groups formed a caucus, which produced two benefits. First, all the different stakeholders now know what the others are doing and make sure that they are not developing competing messages. Second, it is easier to identify the areas in which all groups agree and to develop a clear message to policy makers. Emergency care stakeholders should consider doing something similar.

James Augustine, an emergency physician and medical director and assistant fire chief for Atlanta Fire, suggested that stakeholders talk about success stories in EMS and EDs as a way to gain support for increased funding for emergency care.

Linda McKibben from the Lewin Group noted that geriatricians, like pediatricians, serve a unique patient population that brings special challenges to the delivery of emergency services. She suggested the creation of coalitions among stakeholders and providers, including geriatricians, to work together for change.

A number of attendees also made specific comments about other issues. Dr. Camilla Sasson from the Emergency Medicine Residents' Association explained that the association developed a task force to review the IOM reports. That task force made several recommendations, one of which is to

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undertake a team approach with physicians, nurses, and emergency medical technicians (EMTs) to develop federal legislation to present to policy makers. Second, there should be more funding for resident training to improve disaster preparedness, not just for emergency medicine residents, but for residents in all specialties. In the event of a disaster, physicians from various specialties will be needed to respond, and all should have training. And third, the federal program that offers loan forgiveness for primary care physicians practicing in rural areas should be extended to emergency medicine physicians as a way to bring board-certified, residency-trained physicians to rural areas.

Dr. Eastman invited Dr. Sasson to comment on the younger generation of emergency physicians' attitudes about work-life balance. Dr. Sasson explained that young physicians view their lives outside medicine as very important and may not work as many hours or for as many years as previous generations of emergency physicians. The liability problem in particular serves as a disincentive to continue practice, especially when some emergency medicine physicians can work in the information technology field, for example, for twice the salary with fewer work hours.

Paula Willoughby DeJesus, EMS medical director for the Chicago Fire Department and from the American College of Osteopathic Emergency Physicians, cautioned that plans for regionalization of emergency care services must be practical. It would be difficult for ambulances to go to one hospital for geriatric care, another for pediatric care, another for cardiac care, and so on. She also expressed the need to be explicit about which hospitals should receive support for uncompensated care if Congress heeds the IOM committee's recommendation to make new funding available to hospitals that provide a significant amount of uncompensated emergency care. A hospital may provide limited amounts of care to the uninsured and then send patients to another hospital to finish the treatment. It is important to make sure that funds are directed to the hospitals that are true safety-net providers.

Hunt Batjer, chairman of neurosurgery at Northwestern University, noted that last year less than one-tenth of adult stroke patients were treated with either intravenous or intra-arterial thrombolysis. The reason the fraction is so small is because many of the victims were taken to the closest ED, rather than the ED that was most appropriate for their care. While it is clear which hospitals are best for stroke victims, it is very difficult politically to implement regionalization. When representatives from a hospital try to implement regionalization, it appears to be self-serving. Dr. Batjer suggested that an apolitical body is needed to lead implementation.

Turning to research issues, Nick Jouriles, vice president of ACEP, said that an ACEP board member was recently turned down for an NIH grant, and the rejection letter stated the grant could not be awarded because the

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principle investigator was an emergency physician. Dr. Jouriles disagreed with Dr. Hargarten's earlier comment that emergency care stakeholders should focus on advocating for translational research support from NIH. Instead, he said there is a need for an independent institute for emergency medicine research at NIH. In response, Dr. Hargarten said that the award decision was singularly disappointing, but emergency medicine researchers have made progress at NIH. The translational research centers are currently being funded, and this source of funding should be pursued by emergency medicine researchers.

Dr. Jouriles also noted that ACEP, with the support of the Emergency Nurses Association, developed the Access to Emergency Medicine Services Act (House Bill 3875 and Senate Bill 2750) and encouraged other groups, including the American College of Surgeons and the American Academy of Pediatrics (AAP) to support the legislation.

One of the final comments was from Jeff Bates, an emergency physician at a level 4 trauma center in Texas, located 100 miles from the nearest level I trauma center. Dr. Bates described the plight of rural EDs with regard to critical workforce shortages. There are only three paramedics in his county, so most EMS patients are not served by a paramedic. Most of the nurses in his ED are licensed vocational nurses (LVNs) who have one year of training and no associate degree. Dr. Bates, an internal medicine physician by training, serves as the director of trauma because the hospital does not have a surgeon. He pointed out that there are four emergency medicine physician organizations with different agendas; some he cannot join because he is not residency-trained in emergency medicine. While there is only one emergency nursing organization, the LVNs cannot join it because they do not meet the training requirements.

Dr. Bates emphasized several points. First, there should be increased focus on the emergency care challenges facing small and rural hospitals: 1 in 6 hospitals has 2,500 or fewer ED visits. Second, emergency providers need to collaborate and address core competencies for the workforce. Third, the United States simply does not have enough doctors. Calls to train more physicians in emergency medicine will simply pull from other specialties. An increase in the number of medical schools and training slots is needed.

Luncheon Speaker

Cortez Trotter, chief emergency officer for the city of Chicago, gave the luncheon address and commented on several of the challenges in the reports, noting their relevance to the city of Chicago. He said that, through its consortium of medical directors, the city is already addressing the IOM committee's recommendation to improve coordination of emergency care services. Over the years, the EMS system in Chicago has matured and has

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performed very well. But looking forward, Chief Trotter said that the city will continue to build on the integrated, computer-aided dispatch system that combines police, fire, EMS, and emergency management. Currently, paramedics can communicate in real time with hospitals, but more can be done. The city of Chicago and the state of Illinois are working collaboratively to develop more solutions to the types of challenges described in the IOM reports.

Chief Trotter addressed the issue of funding, noting that, while Congress should devote more resources to EMS and hospital-based preparedness programs, stakeholders should not wait for Congress to act. There are strategies, such as Chicago's life safety partnerships, that communities can undertake immediately. He also recommended looking locally for funding. In 2006, Chicago received $37 million from the Department of Homeland Security (DHS) Urban Area Securities Initiative, and it received similar levels of funding in previous years. But there are only so many things that the department can purchase with those funds each year. The latest technologies will make little difference if EMS personnel cannot unload patients at EDs because of overcrowding. Chief Trotter said that stakeholders have not approached him about emphasizing emergency medical services in funding requests to DHS.

He also emphasized that emergency care providers need to bring attention to the work that they do to maximize funding opportunities. When the city of Chicago conducts preparedness drills, the media covers the event and the public recognizes that the city cares about preparedness and keeping its citizens safe. However, the hospital community and first responders tend to be too humble and do not promote themselves very well.

Chief Trotter concluded by saying that the IOM reports represent a good starting point for stakeholders to come together in Chicago and address some of the issues collaboratively. He encouraged providers to take action and offered his assistance in improving the emergency care system.

THE EMERGENCY CARE WORKFORCE

The first afternoon session focused on the emergency care workforce. Four presentations on the workforce were followed by an open discussion. The session was moderated by IOM committee member Nels Sanddal.

On-Call Specialists

Bruce Browner, professor and Gray-Gossling chair and chairman emeritus of the Department of Orthopedic Surgery at the University of Connecticut, discussed on-call specialist workforce issues, particular those related to orthopedic surgeons and neurosurgeons. Many specialists are moving

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away from taking call in EDs because of poor reimbursement, professional liability concerns, disruptions to elective practices, time away from family, occupational hazards, and the lack of staff and equipment available to specialists at night. Specialists are making individual decisions to stop providing care in the ED until these situations are rectified. While there is no formal boycott, the summation of all the individuals withdrawing from care results in a similar impact.

Dr. Browner explained that the American Academy of Orthopedic Surgeons developed a position statement with recommendations that are similar to those in the IOM reports. The statement says that orthopedic surgeons have a responsibility to care for patients in their community and should collaborate with each other and local hospitals to determine how to meet the needs of patients. In addition, hospitals have a responsibility to ensure appropriate circumstances for the surgeons to work, and policy makers have a responsibility to solve the liability problem.

Dr. Browner discussed the proposed development of acute care surgery, a new surgical practice program that has been proposed as a potential solution to the limited specialist availability problem. The original proposal generated considerable controversy because it called for the acute care surgeon to perform some selected neurosurgery and orthopedic surgery in the emergency care setting to improve patient access. Concerns were raised because of the limited training time acute care surgeons would have in those areas and that patient care would be compromised. In addition, Dr. Browner said that acute care surgeons would not be able to provide definitive care, so patient hand-offs would be necessary. He added that surgeons trained in acute care surgery may be no more likely to work in rural areas, where the absence of surgical specialists is felt strongest.

According to Dr. Browner, a better solution is the one recommended in the IOM reports: regionalization. He also suggested the possibility of other strategies, such as allowing tax deductions for services for which specialists do not receive reimbursement, or federal reimbursement for liability costs, or both.

Physician Supply

Steven Krug, head of the Division of Emergency Medicine and associate chair for clinical affairs in the Department of Pediatrics at Children's Memorial Hospital, spoke about the inadequate supply of health care providers, including qualified providers of emergency care. As early as the 1970s, a variety of oversight groups for graduate medical education and professional societies predicted that there would be a significant oversupply of physicians by the year 2000, particularly subspecialists. A variety of policy and funding decisions were developed to essentially halt further growth in

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medical school enrollment and specialty training programs. However, the physician surplus was never realized, and today there is a shortage, particularly in subspecialty areas, including pediatric subspecialty areas. Most experts now predict a critical shortage of physicians by 2020, coincident with an aging population that will consume health care resources at a rate in excess of younger populations. An inadequate supply of physicians is likely to result in more people seeking care in EDs.

Recognizing the problem, the IOM committee called for the Department of Health and Human Services (DHHS) and others to undertake a detailed assessment of emergency and trauma workforce capacity, trends, and future needs and to develop strategies to meet those needs. Also, in June the Association of American Medical Colleges issued a white paper calling for a 30 percent increase in medical school enrollment. Even if there is an immediate increase in medical school enrollment, it will take at least a decade for the effect to be felt, because of the lengthy training process. But simply increasing the number of medical students will not solve the problem, because approximately one-quarter of physicians in residency training today are trained internationally. Dr. Krug emphasized that an increase in both medical school enrollment and residency slots is necessary.

Today the emergency care physician workforce is diverse in terms of disciplines and specialties, and this diversity is likely to continue. There are not enough emergency trained physicians to staff all EDs, and even fewer hospitals have access to pediatric emergency physicians. Dr. Krug highlighted several short-term solutions contained in the IOM reports, including having all health care certification bodies define emergency care competencies and require practitioners to receive the education and training needed to achieve those competencies; having EMS agencies and hospitals appoint pediatric emergency care coordinators to provide pediatric leadership for the organization; developing categorization systems for EMS, EDs, and trauma centers based on service capabilities; and linking rural hospitals with academic medical centers to enhance opportunities for consultation, telemedicine, patient referral and transport, and continuing education.

The Illinois' Emergency Medical Services for Children program has developed a hospital categorization system for pediatric emergency readiness. Hospitals can voluntarily achieve one of three levels: an emergency department approved for pediatrics (EDAP); a standby EDAP, which may not have 24/7 coverage with physicians; or a pediatric critical care center (PCCC), which is an EDAP with a pediatric intensive care unit. These hospitals agree to meet guidelines published jointly by AAP and ACEP in 2001 regarding clinical staff training and continuing education, standards for essential equipment supplies and medications, requirements for key policies and quality improvement, and the presence of clinical leadership. There are approximately 100 hospitals participating as of April 2006.

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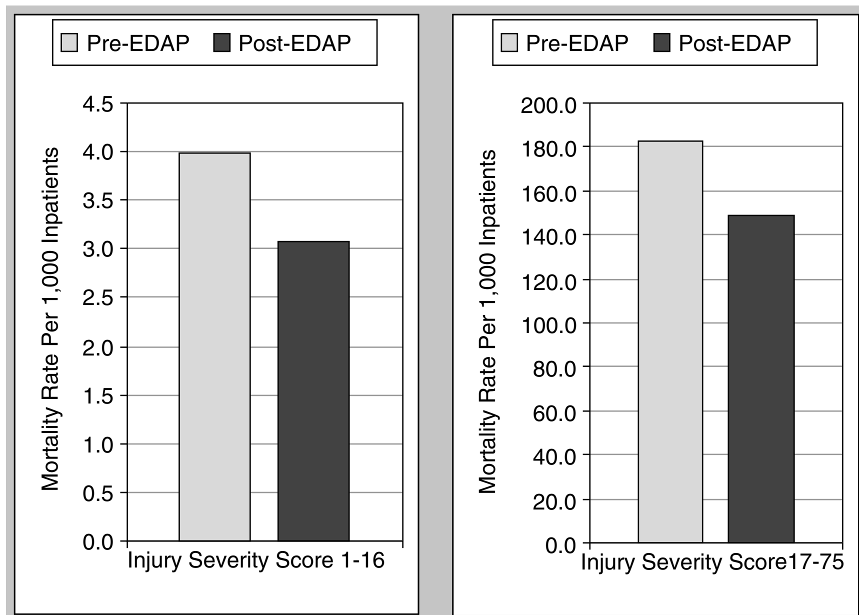

FIGURE 4-1 Mortality rates per 1,000 injury-related inpatient admissions from the emergency department, pre- and post-EDAP, 1994 and 2005.
SOURCE: Illinois Emergency Medical Services for Children and Illinois Hospital Association.

Dr. Krug said that the program has made a difference. Figure 4-1 shows data on the outcomes of pediatric trauma patients, both pre- and post-EDAP, for the Illinois hospitals that have been participating as EDAP or PCCC hospitals. The data demonstrate that these hospitals have seen significant reductions in mortality; 22 percent for the low injury severity group and 18 percent for the high injury severity group. The reductions in mortality for the most severely injured children are in excess of national trends in mortality reductions.

Dr. Krug concluded by describing some of the activities at Children's Memorial Hospital to build and maintain providers' critical skills in emergency medical services. The hospital provides an enormous amount of pediatric advance life support (PALS), advanced pediatric life support, and pediatric education for prehospital professionals training internally and for staff at other institutions, but they recognize that these are not singular solutions. It has been well documented that the knowledge and skill levels

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quickly deteriorate after a PALS course, on average, about six months later. The hospital staff recently developed their own high-fidelity simulation program, named KidSTAR, and are collaborating with colleagues at Northwestern University, evaluating the application of the technology as both a teaching and competency assessment tool.

Workforce Competencies

Patricia Kunz Howard, the staff development specialist/nurse researcher for the ED at the University of Kentucky Hospital and EMS training coordinator for the Lexington Division of Fire and EMS, focused her remarks on provider competencies, emphasizing the importance of collaboration. Because work in the emergency care environment is not conducted in isolation, competency solutions must be collaborative.

The IOM committee recommended that DHHS, in partnership with professional organizations, develop national standards for core competencies applicable to physicians, nurses, and other emergency and trauma personnel. Professional organizations have already identified essential cognitive, psychomotor, and affective skill sets for the providers in their disciplines. However, the various disciplines (medicine, nursing, EMS) tend to be protective of their own training. According to Dr. Kunz Howard, it is important that the disciplines look at each other's practice to identify what services are provided well and where there is room for improvement. Because providers work as a team, each discipline has information that will benefit the others. The disciplines should identify gaps in knowledge together.

Dr. Kunz Howard also noted the importance for the disciplines to consider revising core competencies to reflect changes in emergency care practice. The practice of emergency nursing is very different from 20 years ago, and the skill sets and training may need updating. For example, today emergency providers are faced with an influx of psychiatric patients because of a lack of care alternatives for these patients; however, emergency providers receive limited training in mental health care. ED providers are also faced with caring for boarded patients, which may not have been the case in the past. Credentialing mechanisms should be congruent with current practice and should be evidence based, but more data and research will be necessary.

Consideration of team-focused outcomes is also important, according to Dr. Howard. However, one challenge is that interdisciplinary teams may be different depending on where providers work. In that regard, simulation training may improve teamwork.

Collaboration to improve competencies for the care of special patient populations is also important. While there have been great strides made

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over the past 20 years, research has shown great variability across all disciplines related to pediatric training, and not all facilities or agencies have access to pediatric training courses. Therefore, it is critical that stakeholders build consensus on best practices for special patient populations, so that all providers have the skills needed to provide care to children and geriatric patients.

The Board of Certification for Emergency Nursing is looking at developing a pediatric certified emergency nurse exam. However, the exam may not be practical for all emergency nurses. Dr. Kunz Howard said that nurses at large referral centers should be expected to have appropriate specialty certifications; those in critical access facilities, or community hospitals, should have access to education and the training that they need as appropriate for the kinds of patients they see.

The EMS Workforce

Ronald Pirrallo, professor of emergency medicine at the Medical College of Wisconsin and the Milwaukee County EMS medical director, began his presentation by stating that the IOM committee's recommendations with regard to the EMS workforce are among the most clear and achievable recommendations in the reports.

Over the past 40 years, there have been a number of reports that generated thoughtful, consistent recommendations on education, including *Accidental Death and Disability* (1966), *The National EMS Education and Practice Blueprint* (1993), the *EMS Agenda for the Future* (1996), the *EMS Education Agenda for the Future* (2000), the *National EMS Scope of Practice Model* (2005), and the *National Standard Curriculum* (1996). However, Dr. Pirrallo noted, even after 40 years of examining the EMS workforce, relatively little is known about the EMS workforce. Estimates of the EMS workforce range from 132,00 to 775,000, depending on the source of information.

The only way to obtain better information on the EMS workforce, according to Dr. Pirrallo, is to adopt the IOM committee's recommendations: state governments should adopt a common scope of practice, accept national accreditation of paramedic education, and require national certification. He noted that the recommendations share a common thread of increasing the accountability of the educational institutions and the level of training of the providers. Another notable attribute of these recommendations is that they are clearly targeted at states.

Over the past 40 years, the National Highway Traffic Safety Administration (NHTSA) has driven the development of the National EMS Core Content, the National EMS Scope of Practice Model, and the National EMS Education Standard. He added one shortcoming of the IOM report

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on EMS is that it does not give NHTSA enough credit for establishing EMS educational standards. However, only so much can be done at the federal level; now states should identify and accept responsibility for adopting EMS education standards. According to the IOM report, *Emergency Medical Services at the Crossroads*, "Educational program accreditation and national certification need to be in place before the transition from the national standard curriculum to the national EMS education standards can take place." In other words, states must accept national certification and program accreditation before national standards can be implemented.

The National Association of State EMS Officials has endorsed the EMS Education Agenda, with the condition that no definitive timetable would be set for implementation. Unless the states take action, according to Dr. Pirrallo, basic information on the EMS workforce will remain unknown. With national accreditation and certification, we will at least be able to answer some primary questions about retention and recruitment and be able to determine whether there is there a shortage of personnel or simply a maldistribution.

A final EMS workforce recommendation from the IOM committee is for the American Board of Emergency Medicine to create a subspecialty certification in EMS. According to the report, "EMS systems should have highly involved and engaged medical directors who can help insure that EMS personnel are providing high-quality care based on current standards of evidence." The National Association of EMS Physicians, the leading professional organization for EMS physicians, is making this recommendation a primary short-term initiative. Dr. Pirrallo noted that EMS is clearly part of a practice of medicine, and physician involvement is necessary. One common characteristic of all successful EMS systems is that they have an EMS physician leader behind the scenes.

Dr. Pirrallo concluded by discussing funding. It is clear that most state EMS offices are underfunded. However, national accreditation of educational institutions and personnel certification, in the long run, may actually save money at the state level because state offices would no longer have to take responsibility for those functions.

Open Discussion on Workforce Issues

Several comments were made by attendees following the four presentations. Dr. Blum explained that ACEP will soon undertake a study of the emergency physician workforce. He then inquired whether a lack of faculty is a key barrier to the training of nurses and EMTs. Dr. Kunz Howard agreed faculty shortage is the primary problem with the training of nurses, and 150,000 to 160,000 qualified applicants were turned away from nursing school in the previous year because of a lack of faculty. Dr. Pirrallo

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noted that variability in EMS faculty qualifications is a greater problem in the training of the EMS workforce than faculty shortages.

Dr. Willoughby DeJesus noted that there has been EMS subspecialty certification available to osteopathic emergency physicians for approximately 10 years. However, many physicians who serve as EMS medical directors are not compensated for that role. Mr. Sanddal noted that quality medical direction and oversight are essential to the quality of prehospital care and that physicians should be recognized and compensated for their participation.

Michael Hansen from the Illinois Fire Chiefs Association said that the state of Illinois tried to implement the national registry (i.e., national certification) three times but failed each time. The organization has concerns about cost of the exam, pass rates, and how the exam is written. Mr. Sanddal clarified that the recommendation in the IOM report says that states should accept national certification as a basis for state licensure; it does not mandate national certification.

Dr. Batjer noted that the American Board of Neurological Surgery is considering the creation of several curricula in neurosurgical training programs, one of which would be abbreviated and would focus on emergency care, particularly trauma care for the brain and the spine. This new curricula could result in greater numbers of practitioners delivering care in the ED. Dr. Krug raised concerns about whether these practitioners would be qualified to provide care to children.

Dr. Sasson said that the Emergency Medicine Resident's Association (EMRA) agrees with the IOM committee's recommendation that subspecialty certification in EMS should be awarded. EMRA also supports critical care certification fellowships for emergency medicine residents, noting the shortage of intensivists projected in the future. Many emergency medicine residents would like to receive critical care certification, but the internal medicine critical care fellowship slots are closed to emergency medicine residents.

Scott Altman, an emergency physician practicing in Chicago, added that, with the shortage of practitioners expected in the future, there is a need to think about new ways to distribute human resources by separating technical and cognitive personnel. With improvement in communications technology, it may be possible to have a few highly skilled cognitive specialists in a particular medical field linked to many technicians in the field who can implement the decisions made by the cognitive specialists remotely. Dr. Krug agreed, but said that all physicians must have some basic competency skills to practice.

Carey Chisholm from the Society of Academic Emergency Medicine concluded the open discussion session by noting that residency training slots, in addition to medical school classes, need to expand in order to ad-

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dress the physician shortage; however, residency slots will not increase unless federal caps on funding are removed. He also noted the need to develop more academic departments of emergency medicine across the country.

HOSPITAL EFFICIENCY

The second afternoon session focused on hospital efficiency and technology. Four presentations were followed by an open discussion. The session was moderated by IOM committee member Brent Asplin.

Response from the Joint Commission on Accreditation of Healthcare Organizations

Peter Angood, vice president and chief patient safety officer at the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) spoke about its standards related to emergency services. He began by saying that JCAHO generally supports the recommendations from the IOM reports; however, some clarification is needed around the IOM committee's recommendation for JCAHO to reinstate strong standards for ED boarding and diversion.

When JCAHO develops standards, it puts the information on those standards out on an Internet-based survey tool, which facilitates the field review process. This is JCAHO's way of obtaining direct feedback on the practicality and feasibility of the recommendations. During the field review related to boarding and diversion, JCAHO received an incredible amount of negative feedback about developing standards in those areas. As a result, it focused its efforts on a "comparable standards of care" standard, which says that hospital leaders must identify and mitigate impediments to efficient patient flow through the hospital, and that they should maintain comparable standards of care regardless of where a patient is located.

The Joint Commission used to have a three-year survey review process; when the surveys took place, there was rarely a boarded patient in the ED. However, it is now moving to an unannounced survey process, and they expect to collect more information regarding the problem of boarding in EDs.

A key component of the comparable standards of care standard addresses the needs of admitted patients who are in temporary bed locations awaiting an inpatient bed. Twelve key elements of care were identified by JCAHO and are used in the survey process to evaluate hospitals on this standard. These 12 elements focus on ensuring adequate and appropriate care for patients. They have implications across the hospital organization and should be considered by hospital leaders when planning care and services to the patients. The elements include patient privacy and confidential-

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ity, proper technology and equipment to meet patient needs, appropriate practitioners to provide patient care beyond immediate emergency services, and assurance of communication among all health care providers.

Dr. Angood also mentioned that JCAHO held a roundtable on emergency services in 2003-2004. A white paper, which summarizes the findings from that roundtable, is under development. The white paper will discuss managing demand and improving supply of emergency services, protecting patients, and aligning regulation and financial incentives to promote access.

Dr. Angood concluded by stating that JCAHO will be convening a meeting in early 2007 of hospital-based physician organizations to address in-hospital care, including emergency care. The meeting will focus on getting physicians involved in helping hospitals improve their overall functioning.

Improving Efficiency Through Technology

John T. Finnell, director of the Informatics Division in Emergency Medicine at Wishard Memorial Hospital, discussed two initiatives under way in Indiana to improve the efficiency of care through information technology. In most areas of the country, the health care system fragments patient information and creates redundant, inefficient efforts. The system in Indiana, and the systems of the future, will consolidate information and provide a foundation for unifying efforts.

The Indiana Network for Patient Care (INPC) is an operational, sustainable community-wide health information exchange in Indianapolis that receives patient information from all local medical/surgical hospitals, physician offices, community health centers, city and state health departments, labs, pharmacies, and others. The INPC contains information on hospital discharge summaries, ED and other outpatient visits, inpatient and outpatient lab results, immunizations, operative notes, radiology reports, path reports, medication lists, and more. This information is readily available in seconds to ED staff when a patient enters the ED.

The INPC contains deidentified patient data covering 30 years that are available for clinical research. Recently, researchers at the Regenstreif Institute used the data to examine ED use. They found that a subset of patients visited all five hospital systems in Indianapolis within one year. About 40 percent of ED patients at any particular hospital system have data in other hospital systems, too. Because all five systems are connected to the INPC, the system captured data on all of those visits.

Dr. Finnell also discussed the Public Health Emergency Surveillance System (PHESS) in Indiana. Its goal is to connect all 114 EDs in the state over the next four years. Currently there are 67 connected hospitals cover-

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ing 5,500 ED visits per day. Information from the PHESS is used by the state for electronic surveillance, and the system is capable of detecting outbreaks that individual EDs cannot. For example, data from the PHESS revealed a spike in gastrointestinal cases that led to an investigation by the state health department. The state was able to trace the outbreak to certain products being sold at a local ethnic food grocery store, and the threat was eliminated.

Dr. Finnell concluded by identifying several factors that can contribute to the success of similar projects. First, if there are already information feeds in a hospital, the hospital should use them. It may be very easy to capture the data. Second, a neutral convener, such as the Regenstrief Institute, which is not a health care organization, is needed to lead the project. Health care organizations participate voluntarily, and their servers are separate from the servers in every other system. Organizations have the freedom to withdraw from the system at any time. Third, organizations should proceed incrementally. Finally, the systems described above are based on the establishment of standards. It is important to develop flexible, standards-based infrastructures that can integrate an array of diverse clinical data.

Improving Patient Flow

Linda Kosnik, chief nursing officer at Overlook Hospital, spoke about demand to capacity management, particularly with regard to surge capacity for overcrowding and disaster planning. Increased resources are often necessary to address these issues, but often simply moving the right resources to the right place at the right time will be of great benefit.

Ms. Kosnik described the elements needed to match demand to capacity. First, institutional memory and structured communication are necessary to ensure that the plans that were developed in advance are implemented at the time when they are needed most. Communication cannot wait until a disaster occurs; planning must be done in advance. It also requires demand to be visible and predictable. Direction and information need to be provided to individuals at the moment of stress. Those involved need to understand exactly what must be done to mitigate each specific situation, and in order to accomplish that, the individuals closest to the situation need to be empowered and held accountable. Hospital administrators cannot simply solve problems for those closest to the situation; they need to participate.

Ms. Kosnik emphasized the need for data, noting that one cannot make improvements in the absence of data. She provided an overview of the information system at Overlook Hospital that tracks demand, capacity, and interventions with real-time data. Using color coding, the system indicates whether demand is matched to capacity (indicated by a green signal) or whether demand on the system is escalating (signals change from yellow to

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red) in various units of the hospital. The system also allows for an overview of demand on the system, which is measured by census and acuity. In addition, the system tracks capacity, including equipment and processes, as well as support services and staff. Most critical, the system shows interventions or solutions that can be implemented as demand exceeds capacity. When one of the interventions is implemented, alerts are sent to staff pagers as well as to printers on various units, to make sure that those interventions occur consistently. The interventions provide direction in terms of who should act, what should be done, and where.

The system has done much to reduce diversion at Overlook Hospital. When the system was implemented 10 years ago, the hospital went on diversion every week for multiple days in a row. After implementation, diversion soon dropped to five times per year.

Overlook Hospital also uses the system for emergency preparedness planning. Should a disaster occur, the system will notify all appropriate individuals and stakeholders with instructions on what they need to do, when they need to do it, and where they need to be at different times. A pandemic alert (a drill) was triggered through the system, and messages were sent to multiple pagers, including various organizations in the community, such as first aid squads, the fire department, and the police department. They are automatically asked to come to the hospital, which saves hospital staff the task of making multiple phone calls and ensures that everyone receives information at the same time.

Improving Hospital Quality and Efficiency

Susan Nedza, chief medical officer for Region V, Centers for Medicaid and Medicare Services (CMS), began her remarks by highlighting two assumptions made in the IOM reports. First, the reports state that emergency care providers and advocates can do little to alter environmental factors, such as increasing utilization of the ED by the uninsured, the increasing age and number of chronic conditions of patients, staffing shortages, malpractice insurance rates, declining public and private reimbursement, and disasters. She noted that there is an opportunity to move beyond thinking about EDs as passive receptors and that addressing demand issues is an essential leadership task for ED providers and health system leaders. Hospitals in the United States are currently undergoing one of the largest expansions in facilities since the Hill-Burton Act of 1946, but expansions will not be enough to solve the problem. The demand issues must be addressed.

Addressing patient demand will require coordination with other components of the system, including long-term care facilities, federally qualified health centers, primary care physicians, and others. Coordinating with primary care providers to share patient records and improve chronic care

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will be critical. It is also essential to address the availability of substance abuse and mental health services to reduce the number of patients who make frequent visits to the ED.

A second assumption made in the IOM reports is that it is the role of the hospital chief executive officer (CEO) to address efficiency. However, the CEO is appointed with the approval of the hospital's board of directors, so the board needs to make efficiency a priority. It will also require physician leadership and coordination beyond the doors of the hospital. But expecting hospital leadership to undertake efforts that are not in alignment with the hospital's financial interests or market share is unrealistic. Working with hospital systems locally and at the federal level will be imperative, so linkages between the American Hospital Association and ACEP are critical.

Emergency care providers typically speak about efficiency in terms of process; however, payers think about efficiency in terms of cost: the highest level of quality that can be achieved for the lowest cost. Efficiency cannot be separated from resource allocation decisions. EDs are resource allocation centers that make such decisions as calling consults, allocation of intensive care unit beds, where patients are sent after discharge, and whether imaging is used.

ED crowding and on-call specialty issues may be addressed by pay for performance and a payment system based on episodes of care. As a patient moves through the EMS system, the ED, the catheterization lab, or other units, care would be coordinated throughout the entire process. In the end, the hospital and physicians would be aligned not only in providing quality care based on quality measures, but also efficient and cost-effective care. There would be a greater incentive for proper resource allocation. Hospitals may also be inclined to consider different ways to secure on-call specialists, such as regionalization and the development of virtual networks, if payment is based on episodes of care. Dr. Nedza provided a list of the major categories that payers are considering for episode of care payments, and they include the top 20 ED diagnosis-related groups. Changing payment to episodes of care will change how care is delivered in the ED because it reengineers how hospital leaders view efficiency.

Dr. Nedza added that, in the future, Medicare will focus on value-based purchasing. It will involve evaluating the value of the ED in providing access to the community, managing acute episodes of care, managing chronic disease, and prevention.

In conclusion, Dr. Nedza noted that improving efficiency will need to be done locally. The CMS is not going to fix the problems, but it will implement payment policies and regulatory policies that will set some direction. Transforming the system will involve addressing both supply and demand for services.

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Open Discussion on Efficiency

During the open discussion session, there were many questions and comments about JCAHO's standards. Dr. Blum described a recent survey in which 70 percent of ED directors reported boarding patients in the ED almost every week of the year. He asked why more attention is not given to the problem of boarding by JCAHO and CMS. Dr. Angood responded, saying that JCAHO's strategy has been to promulgate an equal standard of care for all patients, regardless of location. There is an expectation that hospitals will look into their processes of care and develop solutions. Although ED boarding is rarely seen by auditors when visiting hospitals, they are not blind to the fact that it occurs. The problem is likely to become more apparent as JCAHO moves to a process of unannounced visits. Dr. Nedza added that nothing precludes ED providers from reporting their hospital to the state survey process for being out of compliance with Medicare's conditions of participation. Although CMS receives many reports of quality problems, patient boarding in the ED is rarely reported. If the state surveyors give a 28-day warning to a hospital that Medicare reimbursement will be terminated because of lapses in quality of care, a hospital's board is going to get involved.

Debra Livingston from Northwestern University added that the equal standard of care goal creates a burden on ED staff to figure out how to give the same standard of care to patients boarding in hallways. Another member of the audience noted that most physicians, nurses, and EMTs are not familiar with JCAHO's standards. He encouraged JCAHO to educate physicians on a regular basis on its standards, and that academic institutions make the standards a part of their core curriculum.

Brenda Staffan from Rural/Metro Medical Services said that ambulance providers have been using flexible deployment (often called system status management), matching the supply and deployment of ambulance resources with demand, for nearly 20 years. This is a best practice model for collecting information about call volume and using computer-aided dispatch systems to deploy ambulances. She also added that ED overcrowding often results in very long off-load times for ambulances and local EMS systems must be included in discussions with hospitals, state regulators, local health departments, and others about how to address ED crowding.

Dr. Asplin asked the panelists to identify the one or two key things that the industry (providers, hospitals, EMS agencies) can do to implement the IOM committee's vision for the future of emergency care. Dr. Finnell responded that delivering information to providers at the time of care can ultimately reduce costs a great deal. Dr. Nedza added that the systems that have been best able to address the problems described in the IOM reports

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are those that identify a competitive advantage or economic benefit from doing so.

Harry "Tripp" Wingate from the United States Alliance of Emergency Medicine asked about progress implementing pay for performance in Medicare. Dr. Nedza noted there have been a number of hospital quality measures developed to date, and there will be more to come. Also, a group demonstration project is under way that uses financial bonuses to reward hospitals for their performance in certain clinical areas. Some data from the project are available, and they indicate five areas in which hospital efficiency and quality measurement have improved quality and decreased cost.

Finally, Dr. McKibben mentioned the Patient Safety Improvement Act and how it might be used for reporting problems of boarding and patient safety. Dr. Angood explained that the act creates patient safety organizations (PSOs) that will collect and analyze confidential information reported by providers regarding errors or lapses in quality. The PSOs will then report the information to the Agency for Healthcare Research and Quality (AHRQ). Currently, reporting is limited due to fear of discovery or liability concerns. The act provides federal legal privilege and confidentiality protections for the information reported. The PSOs have not yet been implemented. AHRQ is the lead agency, and it is currently developing regulations for the program. The unanswered question that remains is whether providers have an incentive to report.

LESSONS LEARNED FROM TRAUMA SYSTEM DEVELOPMENT

The keynote address was provided by J. Wayne Meredith, chief of surgery at Wake Forest University, Baptist Medical Center, and director of trauma for the American College of Surgeons. Dr. Meredith was asked to address lessons learned from trauma system development, and how they could be applied to the development of a coordinated, regionalized, and accountable emergency care system.

He began his presentation by describing the research showing that trauma centers and trauma systems save lives. Between 1992 and 2002, Canada implemented a coordinated, regionalized, accountable system of trauma care that resulted in a dramatic decline in the mortality rate per population per vehicle mile driven. A study by Avery Nathens found that trauma systems are nearly as effective as mandatory, primary restraint laws in states, and more effective than secondary restraint laws, in terms of saving lives, per vehicle mile driven. And a recent study by Ellen MacKenzie found a 25 percent reduction in mortality among seriously injured patients when care was provided at a trauma center versus a nontrauma center. However, studies also indicate that of seriously injured patients, 40 percent are not treated in a trauma center.

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Dr. Meredith provided an overview of the basic steps for building a coordinated, regionalized, accountable system. They include educating and building legislative and public support, conducting a needs assessment that links to prevention, developing enabling legislation, developing a comprehensive trauma plan, creating oversight structure, adopting operational standards, initiating a performance improvement plan, and conducting periodic external reassessments of the system.

In addition to the basic steps for building a system, Dr. Meredith shared lessons learned from trauma system development that must be considered for development of emergency care systems. Most importantly, systems must be inclusive and developed by individuals with multidisciplinary expertise. Exclusive systems are designed to provide the best care to the sickest patients; inclusive systems cover the care of all patients. If an initiative to regionalize ischemic heart disease were developed, for example, it should include the care of all patients, not just those with cardiogenic shock or ischemic myocardial infarction.

He also described several other lessons learned. First, planners must define resources needed for optimal care and ensure that hospitals have those resources in place. Severely ill patients do not choose where they receive care; public policy dictates where they should be treated. Those hospitals must be prepared. Second, information systems are essential. The National Trauma Databank serves as the information system for trauma; NEMSIS or the INPC in Indianapolis may serve a similar role. Information supports utilization review, prevention efforts, and research. Third, there must also be more evidence-based medicine in trauma and emergency care. Emergency care research has been the orphan of the scientific health care community for decades. Outcome benchmarks for disease processes must be developed.

Fourth, much has been learned from the Trauma Systems Consultation Committee, a multidisciplinary team that conducts compressive on-site trauma system reviews, from developing the evaluation document and making site visits to systems. Dr. Meredith emphasized the collaborative, multidisciplinary nature of the committee. Fifth, regionalization does not mean centralization. Regionalization does not mean that one hospital is responsible for all trauma care or all emergency care. In an inclusive system, all providers participate and understand their responsibilities. Centralization (as opposed to regionalization) results in adverse selection, poor utilization of resources, overwhelmed hospitals, delays in treatment for some injuries, and diminished surge capacity.

Finally, it is essential to assemble all the stakeholders to discuss publicly the structure of the system. Stakeholders must be respectful, honest about their concerns, and willing to listen to other points of view. It is also essential to start and end the conversation by discussing patient needs. For

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example, is the system designed to ensure that centers have access to the patients they need? Or is the system designed to ensure that patients have access to the centers that they need?

Dr. Meredith concluded his presentation by discussing the disappointing lack of support provided by policy makers to improve emergency and trauma care. Policy makers have not received a simple, concise, and consistent message from emergency and trauma leaders. Every time stakeholders meet with federal policy makers, they tell a slightly different story; as a result, policy makers do not know how to help. He emphasized the need to create a simple, concise, and consistent message about emergency and trauma care that all stakeholders can convey to policy makers.

CLOSING

To close the meeting, Dr. Eastman thanked the presenters for their remarks and members of the audience for their enthusiasm and participation. He also reiterated a point made by Dr. Meredith that stakeholders must always keep the best interest of patients in mind when planning reforms to the emergency care system.

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Workshop in New Orleans, Louisiana

The third dissemination workshop focused on prehospital emergency medical services (EMS) and disaster preparedness issues. The workshop began with opening remarks from Alan Miller of Tulane University. He welcomed attendees and emphasized the importance of visitors coming to New Orleans to witness the recovery from Hurricane Katrina and taking note of the work that still needs to be done. He also spoke about the unique situations and environments in which Tulane physicians have provided emergency care over the past 14 months, in vans, ships, a department store, and clinics. Tulane Hospital reopened in February 2006, and it remains the only hospital and emergency department (ED) in downtown New Orleans. Despite all of the challenges over the past year, the Tulane School of Medicine has had a banner year, with record funding for research and the largest entering medical class in the school's history. Dr. Miller concluded by saying that he hoped the lessons learned from Hurricane Katrina have made the nation better prepared for future disasters.

REFORMING HEALTH CARE

Following a summary of the findings and recommendations from the Institute of Medicine (IOM) reports by committee members Nels Sanddal, Brent Eastman, and Tommy Loyacono, Senator David Vitter (R-LA) spoke about several goals for reforming health care in New Orleans and nationwide. First, he discussed the need to disband the two-tier health care system under which access and quality depend on one's income. The New Orleans recovery represents a once-in-a-lifetime opportunity to fundamentally re-

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design the health care system to improve services for low-income groups. Second, he spoke of the importance of investing in a national health care information technology system. Such a system would have aided displaced New Orleans residents, who received health services in different parts of the country following Hurricane Katrina. Third, the medical liability system is in need of reform. Senator Vitter noted that he is a cosponsor of the Access to Emergency Medical Services Act, which would provide liability protection and increase compensation for emergency providers. Finally, Senator Vitter discussed the movement toward pay for performance under Medicare, advocating for a system in which physicians receive higher reimbursement for reporting quality measures.

Several members of the audience posed questions to the senator. Domenic Esposito, from the University of Mississippi, discussed a recent Harris Poll showing that when Americans were informed about the function and efficacy of trauma centers, they were willing to pay a tax to support trauma systems. However, the federal program for trauma was eliminated from the federal budget. In response, Senator Vitter said that he believes that EMS is best handled at the local level and best supported by local taxes.

Tina Coker of Lakeview Regional Medical Center raised a suggestion that health departments expand services using advance practice nurses to help alleviate ED crowding. Senator Vitter said that he did not have the expertise to comment but that he was open to the suggestion.

Ricardo Martinez of the Schumacher Group thanked the senator for his support of the Access to Emergency Medical Services Act and inquired about its chances for passage and ways for providers to show support for the bill. Senator Vitter said that its passage is directly proportional to Republicans' success in the November 2006 elections.

REACTIONS TO THE IOM REPORTS

Regional Perspectives

A panel of state and local representatives participated in a conversation about the reports based on a series of questions set in advance. The discussion was moderated by Dr. Eastman, chief medical officer of ScrippsHealth. Respondents included Bill Brown, executive director of the National Registry of Emergency Medical Technicians (EMTs); James Moises, an emergency physician at Tulane University Hospital and president of the Louisiana Chapter of the American College of Emergency Physicians; Sandra Robinson, deputy director of the New Orleans Health Department; and Suzanne Stone-Griffith, assistant vice president of quality at the Hospital Corporation of America.

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What Are the Key Messages of the IOM Reports?

Ms. Stone-Griffith said that the key messages of the IOM reports are that the system is fragmented and underfunded, and that regionalization of emergency care is needed. Dr. Moises highlighted several challenges described in the report, including ED crowding, the on-call specialty shortage, limited capacity for an increase in surge capacity, the burden of uncompensated care, and fragmentation of the EMS system. He noted the need for liability reform and increased funding dedicated to improving emergency care for children. In response to a question by Dr. Eastman, he noted that ED crowding could probably be reduced if patients had better access to primary care.

Dr. Robinson began by stating that the IOM reports were a joy to read and very comprehensive. She explained that the residents of Louisiana have among the highest rates of morbidity and mortality in the country. Instead of receiving ongoing care for their conditions, residents seek episodic care in EDs, in large part because many are uninsured. She also noted that the key messages of the reports included improving provider education and training and the importance of coordination.

Mr. Brown said that the reports' emphasis on fragmentation without standardization was key. There is a need to measure system performance and conduct research to drive standardization of practices.

Are There Any Important Points that the IOM Reports Missed?

Mr. Brown said that, although the reports were very thorough, the retention of EMTs deserved more emphasis. Approximately every 5 years, the entire EMS workforce turns over; for every EMT who works for 10 years, there are 2 who quit in less than one year. The reports do not make it clear to policy makers that retention is a significant problem.

Dr. Robinson noted that the reports failed to discuss reimbursement issues surrounding primary care, which is key to addressing some of the ED overcrowding issues.

Dr. Moises said that, although the reports are very comprehensive, four areas received too little attention: geriatrics, mental health, the nursing shortage, and ED capabilities. Geriatric emergency care is of growing importance as the baby boomers age because geriatric patients require more work-ups and more time in the ED. Psychiatric care is another growing problem for EDs because of the lack of facilities to care for patients with mental health problems. The nursing shortage is a problem not only in EDs but also throughout the hospital. Finally, Dr. Moises said that he wished the reports were more forceful in saying that not all EDs are optimal for all time-sensitive illnesses.

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Ms. Stone-Griffith added that, although she thought the reports were excellent, she disagreed with the IOM committee's recommendation for the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) to enact tougher standards against crowding and boarding. She noted that JCAHO enacted a leadership standard related to the efficient flow of patients through the hospital in 2005. She also said that the reports speak a lot about the increased funding that will be needed, but they do not offer much advice for strategies that providers can immediately undertake in the absence of funding increases. Finally, Ms. Stone-Griffith noted that there is a need to align regulations for hospitals. An example, she said, is that hospitals are expected to provide all patients with the same standard of care, so they place admitted patients in beds in the ED when inpatient beds are not available. However, the state of California will fine a hospital if they exceed the number of licensed beds in use. Incentives and regulations for providers should be better aligned.

What Are the Top Priority Areas for Action, and What Are the Barriers to Implementation?

According to Ms. Stone-Griffith, there are two fundamental issues that need to be addressed. First, there must be a strategy to improve the placement of psychiatric patients, who often have very long lengths of stay in an ED. Second, there must be something done to address the problem of access to care for the 45 million uninsured people in the United States. Ms. Stone-Griffith also added the importance of system-thinking and systems training, particularly for front-line hospital managers who are currently not well prepared to deal with systems challenges. The problems must be addressed in a collaborative manner with all stakeholders at the table.

Dr. Moises noted that the IOM reports may raise the awareness of policy makers to these issues. The barriers to implementation are not yet known; they will become more apparent after policy makers respond to the reports. He emphasized that some improvements can be undertaken immediately; for example, hospitals can improve technologies and adopt dashboards and communities can work toward regionalization. Providers should work with JCAHO to set up guidelines on crowding and boarding that are flexible, depending on a hospital's circumstances. There is also a need for greater public awareness that not all providers are capable of providing optimal care for pediatric patients, and there should be a move toward national accreditation for EMTs.

Dr. Robinson added that funding will serve as an important barrier to action. Many hospitals will not reopen in New Orleans because administrators recognize that a large amount of uncompensated care would be demanded. She also discussed technology and the real-time communications

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systems among hospitals that are needed, not only to share patient medical records, but also so that providers can cooperate and coordinate with one another.

Mr. Brown expressed concern that prehospital EMS will get overshadowed by emergency medicine if a federal lead agency for emergency care is created. He said that his top priority would be to make sure that EMS stays at the forefront of attention given to the IOM reports and within a federal lead agency, if a lead agency is created. Selling the reports is going to be difficult, according to Mr. Brown. There is a lot of inertia that must be overcome in order to implement any recommendations. He observed that other reports, including the *EMS Agenda for the Future* and *EMS Education Agenda for the Future* have been dust collectors. Although the IOM reports are generating a lot of discussion, there must be a sustaining and driving desire to get the recommendations implemented in order to see results.

Final Statements

Dr. Eastman invited each of the panelists to make a brief final statement. Ms. Stone-Griffith emphasized the need for all individuals to take active steps—even within their own silos—to chip away at the problems described in the reports. However, going forward, all stakeholders will need to collaborate. In addition, all constituencies—nurses, EMTs, physicians—need to recognize that we are in a new era of emergency medicine and must change the culture and mind set to work together in a new way.

Dr. Moises noted that the American College of Emergency Physicians (ACEP) supports the IOM reports and is working in Washington, DC, to try to move forward with some of the recommendations. He also noted that, despite all the problems in the system, emergency physicians and nurses work in EDs by choice. Dr. Robinson added that all health care providers should work together for the good of the system and make sure that the public and policy makers understand the critical situation of the nation's emergency care system. Mr. Brown concluded that providers need to "quit talking and start acting."

Open Discussion

Dr. Esposito, a neurosurgeon, stated that organized neurosurgery believes the IOM reports are among the best pieces of work published on emergency care in the past 15 years. He also described how, after Hurricane Katrina, there is only one level 1 trauma center in the state of Mississippi, and it is failing financially. He noted three solutions to the problem: regionalization, improved reimbursement, and liability relief. He also voiced

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disagreement with the concept of using acute care surgeons to perform selected neurosurgical procedures in the ED, a strategy proposed by some groups to improve access to on-call specialists.

Tom Judge from Lifeflight of Maine congratulated the committee on the reports and made several comments. First, he noted that for years the public has been assured that if they call EMS, the system will respond to their needs. Today the public is doing just that, but their utilization is often characterized as inappropriate or a misuse of resources. He warned that stakeholders should be careful using language such as "inappropriate use" or "misuse" given the promises made to the public. Second, the report does not talk enough about demand, specifically, rising demand, and sources of demand for emergency services. Third, the reports call for a considerable amount of new funding; however, there is a need to look at alternative models for emergency care that could be developed in the absence of new funding. Finally, he expressed strong support for a federal lead agency for emergency care in the Department of Health and Human Services (DHHS).

Linda McKibben from the Lewin Group asked whether the epidemiology of ED boarding, in terms of who is at risk for being boarded, contributed to the committee's decision to recommend the elimination of patient boarding. Dr. Eastman responded, saying research indicates that the ill effects of patient boarding occur not only to those who are boarded but also to other patients in the ED. Mr. Sanddal added that he was not aware of research on the epidemiology of patient boarding.

Patrice Greenawalt from the Oklahoma City Department of Health described two changes under way in Oklahoma that are helping to relieve ED overcrowding. First, there has been a big change in tribal medicine, in which hospitals are shrinking in size but increasing their ambulatory outpatient component. Second, in one community, hospitals are seeing a decrease in ED patient flow after forming a partnership with the local federally qualified health center, which is available to provide primary care to uninsured patients.

Dr. Martinez noted that it is easier to move forward legislatively when groups representing providers and hospitals demonstrate strong support for an initiative. He asked whether there were any strategies that would appeal to both the hospital industry and emergency providers that could gain collective support. Dr. Eastman responded, saying that at ScrippsHealth, specialists take on the risk and responsibility of an exclusive contract for on-call services and receive reasonable reimbursement for doing so. That arrangement works well for all parties. Ms. Stone-Griffith agreed with Dr. Martinez's comment, saying it is easier to move legislation forward when stakeholders' incentives are aligned, which is currently not the case.

Ray Bias of Acadian Ambulance Service asked what the professional

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organizations were doing to improve recruitment and retention of personnel. Mr. Brown said that the National Association of EMTs will hold a summit on workforce that will address retention strategies. There is not a lot of information available on whether previous strategies have been successful. Mr. Loyacono added that in order to improve retention, there is a need to make the job for EMTs more achievable. Currently, it is a physically demanding job with long shifts working outside, sometimes in extreme temperatures. In addition, EMTs should be compensated at a level commensurate with their counterparts with similar education and responsibilities, including police and firefighters. Paramedics are generally underpaid compared with other professions with similar education levels. Dr. Moises added that there is a new locally designed program to increase paramedic recruitment by pushing paramedics to a higher level of practice. Paramedics receive more training than what is normally required and are providing advanced prehospital care. They are able to make a bigger difference in the field, which makes the job more attractive.

Arthur Yancey, deputy director of health for EMS in Fulton County, Georgia, expressed support for the concept of regionalized emergency care and discussed the dynamics of regional councils. In order to be effective and not purely advisory, regional councils must have funding and organizational authority. In the early years of EMS development, regional councils received federal funding and had authority to develop EMS systems. When the funding was withdrawn in the early 1980s, the regional councils became advisory in nature. In order to regionalize emergency care services, there will have to be funding for the councils—a point that the IOM reports do not address.

John Newcomb from the U.S. Alliance of Emergency Medicine highlighted a section of one of the IOM reports on hospital-based emergency care, which said that there are not enough residency-trained, board-certified emergency physicians in the United States to staff all EDs, so physicians from other specialties remain an essential part of the ED workforce. Dr. Newcomb asked whether the IOM committee believes that non-residency-trained, non-board-certified physicians can attain the core competencies recommended to practice competent emergency medicine. Dr. Eastman responded that the key point is to have all emergency physicians committed to providing good care and participate in a regionalized system in which patients can be transferred to a higher level of care, if necessary. Similarly, Mr. Sanddal added that whether a non-residency-trained, non-board-certified physician can attain all of the same competencies as someone trained in the field is unclear; however, they can certainly attain the skills needed to perform basic tasks (e.g., open an airway, insert an endotracheal tube, start an intravenous drip) to stabilize and transfer patients to a higher level facility if necessary. Dr. Moises added that it is not practical to mandate that all

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emergency physicians be residency trained and board certified; however, the public has a right to know the qualifications of their providers.

Milton Tenenbein from the American Academy of Pediatrics emphasized that the problems of crowding, boarding, and diversion are symptoms of a problem in the hospital system, not just a problem in the ED. And it is not simply a problem of uninsurance. In Canada, where residents are covered under a universal public health insurance system, similar problems persist. To address ED crowding, boarding, and diversion, it is essential to focus on problems in the inpatient side of the hospital.

A FEDERAL PERSPECTIVE

Jeffrey Runge, chief medical officer of the Department of Homeland Security (DHS), provided the keynote address and spoke about the development of EMS and its remarkable progress over the past 30 years. Although many parts of the emergency care system are stressed and on the verge of collapse, EMS is not. EMS is in a state of evolution that reflects advances in emergency medicine, the advent of trauma systems, and EMS advocacy at the federal, state, and local levels. It has also benefited from many national reports and studies on EMS, the IOM reports being the most recent.

Dr. Runge explained that one of his responsibilities involves enhancing federal advocacy for EMS and putting into place institutions that will help the agency prepare for, respond to, and recover from disasters. It is the responsibility of DHS, DHHS, and the Department of Transportation to shore up institutions, provide equipment and training, support common standards, conduct exercises, and plan for contingencies. However, when a disaster occurs, the public will call 9-1-1. Therefore, the quality of local response defines the quality of the overall response. Ultimately, preparedness is local.

Dr. Runge spoke about the importance of collecting data and developing evidence-based standards. He said that the National EMS Information System (NEMSIS) deserved greater attention in the IOM reports. Once sufficiently utilized, NEMSIS has the potential to create a stronger evidence base for EMS. However, he was pleased that the reports advocated for a national scope of practice, accreditation for paramedic education programs, and national EMS certification. While many question the need for national standards, all patients deserve a minimum standard of proficiency when they call 9-1-1, just as they do when they enter an ED. In addition, paramedics and other first responders should have minimum standards for personal protective equipment.

Dr. Runge also addressed EMS funding, noting the divide between prehospital and hospital-based reimbursement and between EMS funding and funding for police and firefighters. The House Appropriations Com-

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mittee recognized this divide and made it clear that DHS must address the funding disparities. Dr. Runge's office is in the midst of a reorganization to ensure that medical preparedness is an important component in the 2007 DHS grant guidance.

Dr. Runge said that he disagreed with the IOM committee's recommendation for the creation of a lead federal agency for emergency care within DHHS. Instead, he said that a structured, formalized interagency process—the Federal Interagency Committee on EMS (FICEMS)—should provide leadership and advocacy for emergency care at the federal level. Although FICEMS has been in existence for many years, it had no statutory authority until 2005. Since then, it has become more effective through high-level agency involvement. FICEMS will give the federal government a starting point for implementing the IOM committee's recommendations.

Following Dr. Runge's remarks, Mr. Judge expressed appreciation to Dr. Runge for his commitment to emergency care leadership at the federal level, but noted that in the year since FICEMS gained statutory authority, there have not been any results. In response, Dr. Runge said that FICEMS will produce results in the next six months to a year. FICEMS is stronger today because of its dual-level involvement of program-level staff as well as political appointees from various federal agencies.

A STATE PERSPECTIVE

Jimmy Guidry, the state health officer of Louisiana, spoke about some of the ongoing initiatives to improve emergency care and emergency preparedness. For the past four years, the state has been working through the legislative process in partnership with EMS, hospitals, emergency physicians, and surgeons, to develop the Louisiana Emergency Response Network (LERN). LERN will help coordinate the regionalized hospital system that was formed in the state after September 11 with support from a grant from the Health Resources and Services Administration (HRSA). LERN will have a medical command and control center to help coordinate the transportation of patients to the optimal facilities. It will track which hospitals have available beds and will be able to determine which hospitals have the expertise and technologies available to treat different types of patients. The legislature provided $3.5 million for the project this year.

Another important state initiative under way is the redesign of the health care system after Hurricane Katrina. As part of the redesign, the state is trying to find a way to ensure that all residents have access to a medical home, in part to relieve some of the patient load for EDs. One strategy involves creating more federally qualified health centers to address the needs of the uninsured and serve as a medical home for those patients.

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One of the challenges of developing a medical home is that the home must be convenient and accessible.

Dr. Guidry observed that policies regarding funding and reimbursement will be key to the success of LERN and the redesign of the health care system. For example, the network's command center will make decisions about where to transport trauma patients, who are often uninsured. Such patients often require specialized, expensive care and may spend hours in an operating room. Naturally, there will be limited incentive for physicians and hospitals to participate in this system if they do not get paid for their services. With regard to the redesign, DHHS Secretary Leavitt is encouraging the state to make sure that funding follows the patients.

ADVANCING PREHOSPITAL EMERGENCY MEDICAL SERVICES

The first afternoon session focused on EMS. Four presentations on various EMS issues were followed by an open discussion. The session was moderated by IOM planning group member Ray Bias.

Air Medical Services

Tom Judge, executive director of Lifeflight of Maine, discussed several issues in air medical services. He began by acknowledging the IOM's recommendation for states to assume regulatory oversight of the medical aspects of air medical services. He noted that, over past 18 months, the Association of Air Medical Services, the National Association of State EMS Officials, and the National Association of EMS Physicians have been working on model state regulations in this area.

Mr. Judge spoke about the growth in air medical services over the past decade and how it is a signal of improvement in care. If Critical Access Hospitals are providing good care, then there will be more air transport needed to move patients to higher level facilities. Also, 70 percent of air medicine transports are hospital-to-hospital, which represents care provided to high-acuity patients, not simply fast transport from a scene of an emergency to a hospital. Air medicine involves the deployment of the tertiary care center into a mobile setting for both the stabilization and transport of patients.

He described a number of issues and unanswered questions in air medicine that need to be addressed. For example, there is a series of questions about system design, medical oversight, and how patients are selected. For example, if automatic crash notification technology is adopted in all cars, how will that impact EMS? Also, many issues in aviation need to be resolved, including safety concerns; regulatory issues; and preparedness, infrastructure, and technology costs. All of the reimbursement in EMS is geared toward funding the lowest model of systems, not the highest.

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Regarding costs, the public should be educated about the cost of EMS interventions and lives saved. For example, it costs approximately $820 per life saved to place defibrillators in the community; however, other interventions are much more costly. He concluded by saying that the single most important recommendation from the IOM reports is the call for building accountability into the emergency care system.

Improving Funding, Reducing Crowding, and Enhancing Disaster Response

Kurt Krumperman, senior vice president of federal affairs and strategic initiatives at Rural/Metro discussed three issues that were raised in the IOM reports: EMS financing, ED overcrowding, and disaster preparedness and response. In the area of EMS financing, Mr. Krumperman began by describing the poor payer mix facing EMS systems. Only 18 percent of transports are for privately insured patients; 26 percent are for uninsured patients. The balance of transports are for Medicare and Medicaid patients; Medicare reimburses ambulance service below average cost and Medicaid reimburses at approximately 50 percent of the Medicare amount. He called for Congress to create a funding mechanism similar to the disproportionate share hospital funding for ambulance services and increase Medicare and Medicaid rates.

He also added that reimbursement should account for the cost of readiness. Traditionally, the first response infrastructure has been funded through community tax support, and ambulance transport fees have been the source of funding for ambulance service infrastructure and the cost of providing the service. However, recently there has been a trend toward using some portion of the ambulance transport fees to support first response infrastructure. This practice has been encouraged by several rulings by the Office of the Inspector General. Mr. Krumperman noted the importance of developing a separate funding mechanism for first response, and called for Congress to develop an EMS infrastructure grant program similar to the one available for fire services.

Regarding ED crowding, he said that ambulance parking needs to end and there are potential EMS solutions to this problem. As discussed in the IOM reports, developing alternative destinations for patients and treat-and-refer strategies should be explored through pilot projects. There are several areas of the country already experimenting with various strategies to reduce ED crowding, ambulance parking, or both, and the outcomes should be evaluated. One such strategy deserving of study is Nevada's law requiring a 30-minute patient offload time at hospitals.

Finally, Mr. Krumperman discussed disaster preparedness and response. The Emergency Management Assistance Compact (EMAC) is a congres-

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sionally ratified organization that provides form and structure to interstate mutual aid. EMAC assisted with the response to Hurricane Katrina and Hurricane Rita in 2005. He identified several shortcomings of EMAC: for example, many states have not yet received payment for their response to the hurricanes, and EMAC largely excludes nongovernmental EMS. He encouraged the EMS community to be more engaged at the local, state, and federal level and push for Congress to develop an EMS set-aside for disaster response. Finally, he called on DHHS and DHS to host a stakeholder summit to address federal response issues.

Implementation of EMS Strategies

Drexdall Pratt, head of the Office of Emergency Medical Services, Division of Facility Services, North Carolina Department of Health and Human Services, discussed implementation issues surrounding many of the IOM committee's recommendations for EMS.

Many of the recommendations call for the use of evidence-based practices, but to date evidence is limited on the effectiveness of EMS personnel and services. Mr. Pratt discussed the imperative for states to collect data on each patient encounter; however, states struggle with data collection. In North Carolina, it was a challenge to get the state legislature and providers to understand the importance of collecting data on each encounter. Today the state collects full patient charts for each encounter, but no financial support is provided by the state for this effort. North Carolina's data collection system is funded by the National Highway Traffic Safety Administration, HRSA, and private foundations. Mr. Pratt added that North Carolina is submitting data to NEMSIS, which has the potential to be an important resource of EMS information, but there is no funding to sustain NEMSIS over the long term.

Once a state develops a data system, there must be a way to analyze the data and make them available to providers so that they can improve their practices. Mr. Pratt's office developed tool kits, which allow providers to view their response times. The office is now moving toward making information on clinical areas, such as stroke and trauma, available to providers.

Mr. Pratt also discussed the IOM committee's recommendation to standardize prehospital protocols, describing North Carolina's effort to standardize protocols across the 101 systems in the state. The local chapter of ACEP developed the set of protocols; however, local systems still deviate from those standards. The state is considering mandating that all systems use the protocols, but there has been considerable resistance from the local systems. Another challenge with the development of standardized protocols is that they need to be maintained with the rapidly changing health care

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environment. To be useful, they must be frequently revised, and funding would be needed to sustain the updating process.

Mr. Pratt also discussed the IOM committee's recommendation for demonstration projects, noting that such an effort could be successful with regionalized medical direction, standardized protocols, education programs, and a NEMSIS-based data system using standardized performance improvement initiatives. However, Mr. Pratt questioned whether $88 million, the amount proposed by the IOM committee, would be enough to fund a demonstration program over five years.

Finally, Mr. Pratt concluded by discussing the work of some of the EMS systems in rural North Carolina. The systems partnered with social services and public health, and EMTs go into the community and visit elderly residents. They check blood pressure levels and make sure patients are taking their medications properly. If they find a problem, they notify county case workers. While there are no data to support the effectiveness of these efforts, many believe that the home visits reduce the number of ED visits in the county. Mr. Pratt noted that EMS should receive some reimbursement for these efforts.

Advice Nurse Call Center in Fulton County, Georgia

Arthur Yancey, deputy director for EMS, Fulton County Department of Health and Wellness, described the advice nurse call center (ANCC) referral program under way in the county. Dr. Yancey began his presentation with a quote from the IOM report *Emergency Medical Services at the Crossroads*: "While EMS systems are frequently organized to address major traumas and serious medical emergencies that are an important part of EMS, they often overlook the fact that the overwhelming majority of EMS patients have relatively minor complaints. More effectively managing the entire spectrum of complaints that result in an EMS response could make the system more patient-centered."

Under the program, a subset of callers speaks with an advice nurse rather than receive onsite services from EMS. The ANCC referral program has several goals. First, the program attempts to link callers to definitive services, enroll callers in a primary care program, and arrange transportation to a point of service, as needed. Second, the program matches EMS expertise and resources to 9-1-1 calls for which on-scene skills are required, decreases response times to calls for which timely on-scene care and hospital transport are vital, and promotes disaster readiness by offering paths to medical care independent of on-scene EMS response or EDs. Third, the program strives to achieve financial savings for the EMS system.

The referral program uses a medical priority dispatch program to identify 9-1-1 callers for the program. Certain callers who may have more

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complicated conditions, for example, those age 65 and older, are not entered into the program. Creation of the program required advice nurse call takers as well as enabling technology for the additional phone lines to those nurses.

The program includes a continuous quality improvement effort that is currently under way. The quality improvement effort includes tracking 9-1-1 call taker performance (i.e., an evaluation of the appropriateness of callers referred to the program), taking a survey of callers, tracking EMS response time changes, and calculating financial savings.

Dr. Yancey concluded by saying that public access to emergency medical pool dispatch is an essential component of the EMS service. EMS begins with a phone call to the 9-1-1 center, and the information provided to the callers must be medically appropriate. Alternative care services (e.g., poison control centers, suicide hotlines, advice nurse call centers) appropriate to callers' needs and provided through specialty call centers are components of that system. Medical direction is crucial for each of these alternative care services for efficient, safe, and ethical care. Considerable financial, operational, medical, and emergency preparedness benefits are expected from the ANCC referral program.

Open Discussion

Bill Brown voiced disagreement with two conclusions drawn in the report *Emergency Medical Services at the Crossroads*. First, where the IOM committee calls for states to accept national certification as a prerequisite for state licensure and credentialing of paramedics, the text notes that requiring national certification would increase the cost of licensure. Mr. Brown contended that national accreditation is less expensive than having all states develop their own processes. Second, the report says that the difficulty of the national exams could result in a reduction in the provider pool. Mr. Brown noted that the states that have adopted the national registry have found no reduction in the number of people who enter the system; however, some of those individuals have to take the exam more than once. Mr. Judge added that many EMS agencies operate across state lines, and there is no legal framework for doing so. There must be reciprocity at the state level, and the only way to have reciprocity is to have a known entity in charge of certification.

Juliette Saussy, New Orleans EMS, expressed concern that some believe that the standards for EMS should be lowered in order to attract and maintain the workforce. Dr. Saussy said that standards should not be lowered, but raised. EMTs will not take pride in a profession in which standards are low. Also, the public needs to view EMS as a profession. If standards are

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raised and tests are made more difficult, the workforce will be proud to wear the EMS badge.

Debra Cason from the University of Texas, Southwestern Medical Center, and the National Association of EMS Educators, noted that the association is very supportive of the *National Education Agenda for the Future*, including the call for a national scope of practice, national certification, and accreditation for paramedic programs. She added that she is currently working on the education standards, and one of the challenges is making sure that, as new technologies or practices are developed, EMS educators integrate those elements into the curriculum. Updating the information for the workforce is very important. Mr. Judge agreed, mentioning a study showing that the single best predictor of how a physician treats hypertension is the year he or she graduated from medical school. Keeping up with the thousands of journal articles published each year is not a simple task.

ADVANCING DISASTER PREPAREDNESS AND RESPONSE

The second afternoon session focused on disaster preparedness and response. Three presentations by panelists were followed by an open discussion. The session was moderated by IOM planning group member Ricardo Martinez.

Racial Disparities in Emergency Care and Disaster Preparedness

Albert Morris, president of the National Medical Association, spoke about how the emergency care system and disaster preparedness pose crucial challenges for minority patients and physicians. In contrast to whites, blacks are more likely to be uninsured, use the ED for primary care, wait longer in the ED, and not receive pain medication. While there is a paucity of research on racial disparities in emergency care, evidence suggests that emergency medicine faces some of the same disparity challenges confronting other medical specialties.

Minorities face a number of challenges that make them more vulnerable in the event of a disaster. Prior to September 11, blacks were more likely to suffer severe and preexisting health problems, not have a primary care provider, distrust the government and health care system, and work in jobs involving close public contact in comparison to whites. If a disaster involved a major anthrax attack, there would be additional challenges associated with infection control, quarantine compliance, and disease management because of issues of distrust in the black population. A survey of Katrina evacuees found that 32 percent were unemployed, 42 percent were high school graduates, 32 percent earned less than $10,000 per year, 70 percent had no bank account or credit card, 52 percent had no health insurance, 32

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percent did not have a list of medications, and 40 percent were physically unable to leave or had to care for someone unable to leave.

The reality of minority health and disaster management is that blacks and other minorities are more vulnerable to a health crisis under normal conditions, and inordinately more vulnerable in the event of a disaster. Dr. Morris added that this reality must be specifically addressed to advance emergency care and disaster preparedness for all citizens. The National Medical Association's Environmental Health and Bioterrorism Task Force published a series of recommendations to improve disaster preparedness for all citizens, among them: provide specialized disaster training for health care providers, include minorities at all levels of disaster planning and emergency management, ensure that emergency plans specifically address minorities and other vulnerable populations, perform disaster needs assessments of minority and other vulnerable populations, ensure that medical distribution plans can overcome identified access barriers for minorities and other vulnerable populations, and provide culturally relevant disaster materials and resources.

Dr. Morris concluded by saying "the rising tide will *not* lift all boats." Disaster planning efforts must be customized to fit the members of a community, and we are only as strong as our weakest link.

Disaster Planning for Children

Paul Sirbaugh, associate medical director of the Emergency Center and director of prehospital medicine, Texas Children's Hospital (TCH), described efforts, successes, and lessons learned during TCH's effort to help Hurricane Katrina evacuees who were transported to the Astrodome in Houston, Texas.

Approximately 30 percent of patients in the Astrodome's health clinic were children. The volunteers from TCH who worked in the clinic had a combined 50 years of experience caring for acutely ill and injured children. The pediatric clinic had 24/7 physician coverage, including pediatric emergency medicine physician coverage, a pediatric emergency physician overseeing triage, four generalists, and many other volunteer physicians from the community caring for patients. If needed, subspecialty services were available through EMS transport to TCH. Nurse coverage and lab services were available at all times. In addition, a clinic pharmacy was created and was stocked twice per day. EMS personnel were available quickly if a patient needed transport to the hospital.

Approximately 3,500 pediatric patients were treated onsite over 14 days; fewer than 50 patients were transported to the hospital. What began as a 2-bed pediatric clinic grew to a clinic with 33 acute care pediatric beds, 50 IV observation beds with medical oversight, and 400 isolation beds

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without medical oversight. During the two weeks, TCH never experienced overcrowding and the ED never went on divert. The hospital lost several key personnel while they worked in the Astrodome, but the financial costs were minimal.

Dr. Sirbaugh identified several things that went right during the response. For example, patients received rapid and superb medical attention, there was an appropriate level of cooperation from incident command, there were abundant resources, including volunteers, and there was a sound exit strategy. The TCH staff left after 14 days. However, he also identified a number of areas for improvement, which included involving pediatric experts earlier in the process, identifying and registering evacuees earlier, preventing the separation of parents and children, and moving toward online medical records.

Dr. Sirbaugh emphasized several points to attendees, the first of which was not to wait for rescue. If there is going to be a rescue, it is unlikely to happen during or immediately after the disaster. Also, plan for and create the solutions and find resources that already exist within the community. There are many untapped resources in the community that should be accessed before recreating some of the same resources. Find the resources and ask for help. Give those providing the resources some control and remove any obstacles in their way.

Disaster Preparedness and Response: Keys to Effective Implementation

Dr. Randy Pilgrim, president and chief medical officer of the Schumacher Group, began his remarks by noting how overwhelming it can be to develop an all-hazards preparedness and response plan with so many different critical components for disaster response and preparedness. Based on his experience working with 37 EDs that implemented disaster plans after Hurricane Katrina and Hurricane Rita, Dr. Pilgrim identified three key steps to effective implementation of disaster planning: lay the foundation, narrow gaps, and fund for results.

First, laying the foundation refers to getting individuals prepared, and the most fundamental level is personal preparedness. Individuals need to develop a family preparedness plan, and DHS provides important guidance in that area. In addition, individuals need to be able to communicate. There are 13 electronic methods of communication, and individuals should learn multiple methods and have them available in the event of a disaster. Finally, leadership is an important piece for laying the foundation.

Second, Dr. Pilgrim described the importance of narrowing the gaps. There is so much information that has been published about how to prepare personally, institutionally, regionally, locally, and nationally. The knowledge

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is available, but preparedness plans often do not reflect the knowledge, performance does not reflect the plan, and outcomes measures are not well developed. He added that in the 37 EDs for which the Schumacher Group had responsibility, performance did not reflect the plans during and after Hurricane Katrina, in part because the foundation was not set and the training for the plan was insufficient.

Finally, Dr. Pilgrim discussed funding for results, meaning that funding should be directed in a manner that encourages organizations to achieve specific outcomes. In order to fund for results, there needs to be well-chosen, focused priorities, perhaps developed by a lead federal agency for emergency care. There is also a need for models of training that are designed and proven to produce the performance desired. Finally, there must be a level of accountability. According to Dr. Pilgrim, funding for results could involve a "pay for preparedness" model similar to pay for performance under Medicare, in which better prepared institutions would reap greater financial rewards. The financial incentive structure must also be developed in a way that rewards those who invest in the system. If one particular hospital in a community is well prepared and serves all the community's health care needs during a disaster, that hospital's financial status may be harmed. Rewarding investors means ending the financial disincentives for investing in preparedness and creating a mechanism for support to ensure that prepared organizations are reimbursed at a reasonable level after a disaster.

Open Discussion

Dr. Martinez asked the panel whether there is more, less, or the same level of communication between the right groups of people today than before Hurricane Katrina. Dr. Sirbaugh responded that in his region greater communication has made a huge difference. Dr. Morris agreed. Dr. Pilgrim said that there is more communication today than before, but it is still not optimal.

Several local physicians reflected on their experience during and after Hurricane Katrina. David Klein, a neurosurgeon and professor at Louisiana State University, discussed three issues of importance after Hurricane Katrina: communications, coordination, and care. First, when the hurricane hit, communication lines were disrupted and people could not reach family members. Dr. Klein could not reach his family for 3 or 4 days. Second, there was a failure of coordination. Dr. Klein and several patients at Charity Hospital waited in a garage where helicopters were supposed to evacuate the 75 patients and stranded hospital personnel, but the helicopters did not come for more than a day. With regard to care, Dr. Klein said that he was surrounded by nurses, maintenance workers, security guards, and other personnel from the hospital who cared a lot and worked hard after

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the hurricane. State, local, and national leaders expressed care but lacked coordination to act.

Dr. Moises was working at Tulane University Hospital during the storm and stayed in the area following the hurricane, after the city was evacuated. He said that there were only a handful of local physicians, and a few physicians from the 82nd Airborne Division in New Orleans to care for the 25,000 to 30,000 residents who remained in the city. He said that there were many things done wrong and many things done right. The staff of Charity Hospital was incredibly dedicated, and many people working minimum wage jobs at the hospital stayed and took care of patients. But the problem with Charity Hospital is that the state abandoned the facility, waiting or expecting the federal government to evacuate the patients.

Dr. Moises added that the state of Louisiana and city of New Orleans were not prepared for a true disaster. All of the planning done in advance was for inconveniences—a loss of power or disruption in services. He emphasized that planning must be conducted for a true disaster, one in which everything collapses—not just for two hours, but for a week.

Dr. Moises also spoke about the disaster management assistant teams (DMATs), noting how grateful the city was for their assistance. He noted the importance of bringing in the right types of individuals. For example, Dr. Sirbaugh's clinic, which was staffed with pediatric experts, transferred only 1 percent of pediatric patients to the children's hospital. If that team had lacked pediatric expertise and 10 percent of its patients had to be transferred, it would have overwhelmed Houston's hospitals. One of the problems with the DMATs that came to New Orleans is that few included pediatricians or pediatric emergency physicians.

In response to the comments made by Dr. Moises, Dr. Morris noted the importance of developing leadership in the disaster planning stage and making sure that leaders are credible spokespeople in the community. Dr. Sirbaugh added that leaders need to recognize their limitations and identify other individuals who might be able to contribute. Disaster planning needs to include pediatric and geriatric representatives; a leader cannot simply appoint a public health official who has not cared for patients in years to lead the medical response. He added that both the IOM committee and the American Academy of Pediatrics called for increased pediatric expertise and pediatric representation on DMATs. Currently, there are only a few pediatric DMATs in the country. The teams must also have access to pediatric supplies and equipment.

Dr. Robinson made the final comment, noting that the only group that was flexible and capable of making decisions and acting quickly after Hurricane Katrina was the military. She said that as she was setting up health clinics immediately after the storm, she made several requests to the 82nd Airborne, and they were able to meet those requests. When similar requests

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were made to other government agencies, they were denied because the requests were outside the organization's authority or guidelines. She added that leaders, especially political leaders, are frequently blamed for not being able to act in a disaster, but they are dealing with policies, regulations, and guidelines that must work from within. Dr. Robinson noted that in times of disaster, we need to give flexibility and authority to leaders so they can make quick decisions.

CLOSING

Mr. Sanddal closed the meeting, thanking attendees for their participation. He noted that the day-to-day work of providing care for the sick and injured in the United States is held together by a very fragile system of good will and ingenuity. The IOM committee and many of the workshop presenters provided direction and tools for improving emergency care and disaster preparedness, but now is the time for action.

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Capstone Workshop in Washington, D.C.

The final dissemination workshop was held at the National Academies in Washington, D.C. The meeting was opened by Institute of Medicine (IOM) executive officer Susanne Stoiber, and Nels Sanddal, president of the Critical Illness and Trauma Foundation and chair of IOM's workshop planning group. They welcomed all those present.

SUMMARY OF THE THREE REGIONAL WORKSHOPS

Brent Eastman, chief medical officer of ScrippsHealth, presented a summary of the discussions from the three regional workshops in Salt Lake City, Chicago, and New Orleans. Dr. Eastman noted that the overall message he heard expressed at previous workshops was the need to unite and collectively move forward with the IOM agenda. "It cannot be done by one agency, by one region of the country, or by one individual," he said.

He pointed to several areas of strong interest and agreement among attendees of the regional workshops:

- Research. Research in the areas of emergency medical services (EMS), emergency medicine, and trauma are at a disadvantage. The IOM committee recommended the Department of Health and Human Services (DHHS) study whether a dedicated National Institutes of Health (NIH) center or institute is needed; workshop participants said that a dedicated center or institute is needed and called for its creation.
- Pediatrics. Workshop participants agreed that Congress should

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increase funding for the federal Emergency Medical Services for Children (EMS-C) program to $37.5 million per year.

- Overcrowding/surge capacity. The overcrowding of emergency departments (EDs) is a result of a hospital-wide capacity problem and was a major concern for many workshop attendees. Many communities are struggling on a daily basis with the challenges of crowding, boarding, and ambulance diversion. The absence of surge capacity to handle normal patient volumes makes it clear that the system is not well prepared to handle disasters.
- Uncompensated care. Emergency care in the United States has become "the safety net of the safety net" for uncompensated care, and providers desperately need financial support from Congress. Uncompensated care is also contributing to a shortage of specialists willing to treat patients in the ED.
- Liability. The IOM committee recommended studying the problem, but workshop attendees said resoundingly, "Don't study it, just fix it."
- Regionalization. The single best solution to many of the problems in the emergency care system, including the shortage of nurses, physicians, and specialists, is regionalization. Regionalization would ensure that an individual who is critically ill or injured anywhere in the country would receive expeditious transport to a level of care commensurate with his or her condition. There was resounding support for regionalization at the workshops.
- Disaster preparedness. Workshop participants agreed that for too long EMS has been left out of disaster planning and funding streams. In fiscal year 2002-2003 only 4 percent of the Department of Homeland Security's (DHS's) $3.8 billion budget went to EMS. Yet EMS will be at the heart of any disaster response.
- Workforce. There is a shortage of emergency care personnel on all fronts: physicians, nurses, and emergency medical technicians (EMTs). Creative strategies are needed to address these shortages and improve provider competencies.

The main point of contention raised at the regional workshops, Dr. Eastman said, had to do with the IOM committee's recommendation for the creation of a single federal lead agency for emergency and trauma care in DHHS. While there are a number of very dedicated individuals and agencies with responsibility for some component of emergency care at the federal level, the committee proposed this recommendation as a way to overcome the current fragmentation of authority that exists and to improve federal communication and coordination. Some constituents, however, called first

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for evaluating the efficacy of the Federal Interagency Committee on Emergency Medical Services (FICEMS) to fill this role.

Dr. Eastman also said that workshop participants noted that the IOM reports paid insufficient attention to certain topics, namely geriatrics, mental health and substance abuse, the nursing shortage, and a single-payer system. He acknowledged that these are all very important issues, although some fall outside the bounds of the committee's charge. Also, addressing all issues to the extent desired by some would have extended the report process well beyond the time frame of two and a half years.

To advance the agenda at the federal level, workshop attendees expressed a need for advocates to develop a common voice, a common language, and a clear, consistent message. Demonstration projects are also critical, Dr. Eastman noted, since there is great variation in emergency care systems across the country.

Some workshop attendees cautioned against waiting for Congress to act. Initiative and leadership are needed at every level. Many of the IOM committee's recommendations are targeted to providers and provider organizations, and there should be "change from within." Finally, Dr. Eastman concluded by saying that the agenda for change must always be driven by what is in the best interest of patients.

REACTIONS TO THE IOM REPORTS

Response from Federal Agencies

Mr. Sanddal moderated the first panel of representatives from federal agencies.

National Highway Traffic Safety Administration

Marilena Amoni, associate administrator at the National Highway Traffic Safety Administration (NHTSA), noted that her agency has provided federal leadership for EMS since 1966. Key activities include leading the development of the National Standard Education Curricula and the EMS Agenda for the Future, as well as developing standards for technical program assessments of statewide EMS systems. She also emphasized NHTSA's long-standing collaboration with DHHS and its more recent partnering with DHS for many of the administration's activities. For example, NHTSA is working with DHS to integrate disaster preparedness into the existing EMS infrastructure, and it is working with DHHS and DHS to develop pandemic flu guidelines for EMS and the 9-1-1 system.

Ms. Amoni commended the IOM committee for its vision for a coordinated, regional, and accountable emergency care system, noting that

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NHTSA's activities have been consistent with this focus. She also applauded a number of specific IOM recommendations, including the call for a common scope of practice, state licensing reciprocity, national certification for paramedics, and national accreditation for paramedic education programs. Ms. Amoni noted that NHTSA made the same recommendations in the *National EMS Education Agenda for the Future*, published in 2000.

She also endorsed the IOM committee's call for evidence-based care and the collection of data, saying that she concurs with the need for data to drive both policy and patient care decisions, and evidence-based prehospital protocols are a step in the right direction. She also added that partnerships with professional associations and organizations are critical to developing evidence-based models of prehospital care protocols for treatment, triage, and the transport of patients.

Ms. Amoni said that NHTSA has aggressively moved toward acquiring data, noting that the IOM reports failed to sufficiently recognize the extensive EMS data project, the National EMS Information System (NEMSIS) under way among federal, state, and local agencies. It is an effort to systematically gather and share standardized data on patient care. To date, 48 states have agreed to implement NEMSIS, and 5 have submitted data to the national repository at NHTSA. She said NEMSIS is critical to help develop and ensure accountable, data-driven, and medically directed local and regional EMS systems.

Federal Emergency Management Agency

Glenn Cannon, director of response for the Federal Emergency Management Agency (FEMA), commented that, although the agency received criticism for its response to Hurricane Katrina, it is working hard to restore the public's faith and confidence. The mission of the agency is to save lives and property and reduce suffering from disasters, and agency staff is working tirelessly to accomplish that.

Mr. Cannon highlighted the Emergency Medical Services Institute in Pittsburgh, a regional EMS council that serves a 10-county area around the city, as a model system. Among its many responsibilities, the institute coordinates emergency care services, licenses ambulances, trains and credentials EMS personnel, oversees quality, collects data, and promotes and provides public information and education to the community regarding EMS. The 10-county area is part of a larger region in western Pennsylvania, called Region 13, in which country governments signed intergovernmental agreements to work together for the provision of emergency services, public safety services, and antiterrorism disaster response services. Region 13 is a DHS and FEMA-designated best practice model. Within the region is the Center for Emergency Medicine at the University of Pittsburgh, which

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is one of the few programs in the country in which emergency medicine residents respond to prehospital calls. Residents provide service in the field with paramedics, which gives the residents broader exposure and helps keep paramedics' knowledge current.

Mr. Cannon spoke of several initiatives that FEMA is working on that will strengthen its relationships with the health care community and medical emergency services. Initiatives include a national credentialing system to help verify and identify the qualifications of emergency personnel who respond to an accident or disaster; a comprehensive integrated national mutual aid and resource management system, which provides and tracks logistical supplies and equipment "so that everyone has what they need"; model interstate mutual aid legislation for state and local responders; and an effort to implement communications interoperability in every major city by the end of 2007 and all the states by the end of 2008. Also, Mr. Cannon said, FEMA is establishing a national advisory council to ensure effective federal preparedness, and council members will include health and EMS professionals.

Centers for Medicare and Medicaid Services

Thomas Gustafson, deputy director of the Centers for Medicare and Medicaid Services (CMS), touched on several payment-related issues concerning emergency care services. First, CMS has introduced new coding for emergency care in the outpatient department, including a code for trauma. The new trauma code was designed to recognize the increased resources needed for trauma cases. Second, the IOM committee called for CMS to revise payment for inpatient care to address the boarding problem—in other words, to adjust the relative profitability of elective cases and ED admissions. CMS is in the process of adjusting the diagnostic-related group (DRG) system with the goal of paying more accurately for all patients. It remains to be seen whether this will have much impact on the problem of patient boarding. Third, regarding the IOM committee's recommendation to expand reimbursement for clinical decision units, Dr. Gustafson clarified that CMS does not pay for care in these units; it pays for observation services for three conditions regardless of whether they are in clinical decision units or not. CMS is considering the advice from an outside panel to make two more conditions eligible for payment. Dr. Gustafson explained that CMS has been very cautious about proceeding further on the issue of payment for observation services, because it is an area that has been substantially abused in the past.

Fourth, regarding ambulance services, the IOM recommended that CMS pay for the readiness of these services. It is the belief of CMS that it already does so by incorporating readiness costs into rates for individual

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services. Payment for treat-and-release services, as recommended by the IOM committee, would require a change in statute to implement. The ambulance benefit under Medicare is currently a transportation benefit. Also, regarding the IOM committee's recommendation that CMS permit Medicare reimbursement for ambulance transport to more destinations, such as dialysis centers, Dr. Gustafson clarified that Medicare already pays for transport to dialysis centers, but CMS will have to study the possibility of doing the same for ambulatory care centers.

Finally, Dr. Gustafson said that a technical advisory group will be issuing recommendations for changes to the Emergency Medical Treatment and Active Labor Act (EMTALA). He clarified that the act does not forbid regionalization. Nothing prevents hospitals from sharing on-call physicians, but formal agreements must be in place. Those agreements do not relieve a hospital from its EMTALA obligations.

Department of Homeland Security

Jeffrey Runge, chief medical officer at DHS, said that the core of incident management is how well citizens with injuries are treated and how well we are able to rally the institutions that are used every day. In the event of a disaster, people will call 9-1-1, and the responders will be local providers. While preparedness is also a federal issue, preparedness is fundamentally a local issue.

Dr. Runge also said that DHS is essentially an integrator. It does not have a specific territory, but brings together sister agencies in order to improve preparedness. He added that DHHS, DHS, the Department of Transportation, the White House, state and local government, and the private sector all have to work together to fix the emergency care system. He said that the lead federal agency for EMS in the federal government is FICEMS, and the participants in FICEMS will work their best to create a regional system. He emphasized that reforms to the emergency care system must involve an interagency process.

He also discussed funding for emergency preparedness and the disparity between hospital and prehospital reimbursement and between EMS funding and the funding for other first responders. Congressional appropriators have made it clear that DHS must fix the problem that EMS received only about 4 percent of DHS first responder funding in 2002 and 2003. Dr. Runge said that he is reorganizing his office to make sure that the requirements for medical preparedness are emphasized in the grant guidance in the future.

Dr. Runge also added that "crisis" is a word that is overused to describe emergency care. While parts of the emergency care system are in dire need

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of fixing, the system has advanced a long way since the 1970s. Emergency care is a victim of its own success.

Finally, Dr. Runge emphasized the need to move beyond opinion, but to do so, good data systems must be in place.

Office of Public Health Emergency Preparedness

W. Craig Vanderwagen, assistant secretary for public health emergency preparedness at DHHS, thanked the IOM committee and the agencies that supported the study for their contribution and willingness to examine the broad set of emergency care issues.

Dr. Vanderwagen noted that DHHS has created a study group that is looking in extensive detail at the IOM committee's findings and recommendations. Leadership was identified as the highest priority area for improvement. Internally, DHHS must be more effective in providing a coherent approach to how the department handles emergency care issues. He added that the recently passed Pandemic and All Hazards Preparedness Act calls for the secretary of DHHS to promote improved emergency medical services, medical direction, system integration, research, uniformity of data collections, treatment protocols, and policies with regard to public health emergencies.

He said that DHHS has made a commitment to building regional capabilities and supporting regional activities. One of the lessons learned from Hurricane Katrina is that regional capacities should be built both locally and in the regional aspects of private- and public-sector activities. His office is expanding its regional staff, and the Health Resources and Services Administration (HRSA) grant program will include regionalization as a target. DHHS is also working to support the development of regional mobile response capability, noting that regional capabilities may have more merit than developing an isolated federal asset that is moved to various locations. A regional asset that will be built, owned, and cared for by people locally will be more responsive to local needs.

Dr. Vanderwagen concluded by emphasizing the importance of research and analysis of data, noting that earlier in his career he worked with the Indian Health Service, which implemented an electronic health record. The data produced allowed researchers to analyze the effectiveness of the care delivered, and it helped staff understand where systems were failing and explore the quality of individual providers.

Open Discussion

Mr. Sanddal invited members of the audience to ask a question or to make a brief comment. Nancy Bonalumi, president of the Emergency

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Nurses Association, expressed disappointment that the IOM reports devoted minimal attention to the nation's nursing shortage. Mr. Sanddal responded that the reports explain that the workforce shortage is systemic across all disciplines (physicians, nurses, EMTs) and acknowledged that they may not have discussed the issues at a level of depth that would meet the satisfaction of all provider groups.

Edward Cornwell III, speaking on behalf of the Committee on Trauma of the American College of Surgeons, thanked the speakers from the federal agencies for their work and said that the problems under discussion are very similar to the problems that the trauma system experienced in previous decades. He encouraged the federal agencies to rely on the American College of Surgeons for guidance and support. Many states and regions have invested resources in trauma care, and research indicates that it has led to improved patient outcomes. Dr. Cornwell also responded to Dr. Runge's remark about not characterizing the state of emergency care as a crisis. He said that the shortcomings in the system are a crisis to those who have lost lives because of a lack of access.

Dr. Runge responded by saying that "it is not a crisis until the people feel it," and those in the trauma and emergency medicine communities "have done such a great job of making lemonade out of lemons that the people don't yet feel it." He described the IOM reports as the canary in the coal mine and a harbinger of things to come, but until the public feels it, they will not demand reform. Also in response to Dr. Cornwell's comments, Mr. Sanddal said that the inclusive trauma model is heralded in the IOM reports as a model on which other response capabilities can be built.

Alex Valadka, representing the American Association of Neurological Surgeons and Congress of Neurological Surgeons, said that a major problem with regionalization is that smaller outlying hospitals ask level 1 trauma centers to admit patients with minor injuries or trauma, flooding level 1 trauma centers and causing them to go on diversion. He acknowledged that hospitals could have written agreements to deal with this problem, but "that doesn't really happen out in the real world." Dr. Gustafson acknowledged that it is a very real problem and the EMTALA technical advisory group is examining it.

Thomas Judge, representing the Association of Air Medical Services, began his remarks by expressing support for FICEMS. He also mentioned that, while disproportionate share hospital funding does not cover the full cost of uncompensated care for hospitals, EMS does not receive any federal funding to support uncompensated care. He also described how Medicaid reimbursement for ambulance service varies widely across states but generally pays well below the cost of care. Mr. Judge also noted that, under DHS rules, little money has gone to improve infrastructure, such as the creation

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of helipads. Finally, he noted that NEMSIS did not receive appropriate emphasis in the IOM reports.

Linda Degutis, president-elect of the American Public Health Association, agreed with Dr. Runge's earlier comment that the public has not felt the true failings of the emergency care system. They will not recognize that there is a problem until the system does not perform. In addition, she urged the organizations present at the workshop to form a coalition to move things forward and advocate collectively for change. In order to do this, organizations will have to let go of their individual interests and work together.

Congressional Staff Panel

Robert Bass, executive director of the Maryland Institute for EMS, moderated the congressional staff panel. Panelists included Jennifer Bryning, public health preparedness policy director for the Senate Health, Education, Labor and Pensions (HELP) Committee, Subcommittee on Bioterrorism and Public Health Preparedness; Debbie Curtis, chief of staff for Representative Pete Stark (D-CA); Lisa Henning Raimondo, military nurse detailee in the office of Senator Daniel K. Inouye (D-HI); and Billy Wynne, health council for the Senate Finance Committee.

Ms. Bryning focused her remarks on the just-passed Pandemic and All Hazards Preparedness Act (S.3678), explaining that the legislation will be key to addressing the IOM committee's recommendation for stronger disaster preparedness and the creation of a coordinated, regionalized, and accountable system. The act does two main things: reauthorizes the 2002 Bioterrorism Act and builds on the Project Bioshield Act of 2004. Specifically, the new law makes the secretary of DHHS responsible for public health and medical preparedness in response to emergencies and unifies DHHS preparedness and response programs under an official, namely, Dr. Vanderwagen. It also moves the National Disaster Medical System from DHS to DHHS.

The act also provides funds for state and local preparedness by reauthorizing over $1 billion in grants to state and local entities for public health and medical preparedness. For the first time, the law stresses accountability by requiring that DHHS establish evidence-based benchmarks and performance standards to measure progress and require states and other funding entities to report on their progress. The act also improves public health security by modernizing how public health departments detect, respond to, and manage the public health threats by collecting instant electronic information. It also strengthens public health infrastructure by offering loan repayments as a way to recruit and train a stronger public health workforce to respond to emergencies. The act will also help speed

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up emergency medical response by improving training, logistics, and planning for health care providers and volunteers. It promotes the use of mobile hospitals and alternative federal facilities to help handle a surge in patients, and it makes it easier for health care providers to respond and volunteer during emergencies.

Ms. Raimondo focused her remarks on emergency care for children. Through the reauthorization of the Emergency Medical Services for Children Act, Senator Inouye hopes that there will be continued improvements in EMS for children nationwide. She told the audience that the senator intends to represent their interests at the beginning of the 110th Congress by offering a bill to reauthorize the act. A similar bill was presented last year and referred to the Senate HELP Committee but was not acted on. She expressed more optimism about moving forward with the bill with Senator Edward Kennedy (D-MA) as chairman of the committee.

Ms. Curtis praised IOM reports for their ability to bring problems to the public's attention; however, she said, they fall short of prescribing legislative ways to fix problems in the system. She added that many of the recommendations are fairly small (for example, the creation of a lead federal agency for emergency care and having the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) enact tougher standards on crowding, boarding, and diversion) and do not provide Congress with clear direction.

Ms. Curtis added that it is "unconscionable" that the nation's EDs are not prepared for children and that Congress should not be needed to intervene to make sure that the nation's emergency rooms are prepared for children. Medical institutions need to do a better job in that regard.

Endorsing the IOM committee's recommendation for regionalization, Ms. Curtis acknowledged that implementing it might require some changes to EMTALA. But she warned that Representative Stark, as the author of EMTALA, may not approve changes to the law lest others take the opportunity to do harm to it. She noted that EMTALA is the one law that guarantees access to health care to everyone in the country. She emphasized that as we address the crisis facing EDs, we must not end up doing harm by closing the doors to people who need the access to care.

Ms. Curtis noted that Los Angeles passed a tax increase to address a crisis in ED funding after running a public advertising campaign. She said making Congress act on something as big as reforming the EMS system will require a nationwide realization that the issue is a problem not only for the uninsured, but for all individuals.

Regarding the issue of the shortage of on-call specialists, she said that hospitals "bring this on themselves" by paying doctors extra for taking call. It used to be understood that as a condition of having admitting privileges at a hospital, specialists were on call for certain amounts of time. She

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suggested that Congress could alter the conditions of participation under Medicare to deal with the problem.

Finally, Ms. Curtis warned about the growth of specialty hospitals, noting that they grow when Congress does not act. She said that she recently met with a group of hospital leaders who discussed the possibility of creating freestanding EDs. While not prepared to say whether these are a good idea or not, she emphasized that we need to think about the most constructive ways for a health care system to function. It must work well for both providers and patients.

Mr. Wynne described several areas of activity for the Senate Finance Committee. A recently passed Senate bill introduces pay for performance for physicians under Medicare. It encourages, through financial incentives, physicians to report selected quality measures that have been vetted by specialty societies and will be tracked by CMS. Mr. Wynne said that pay for performance is a trend that is likely to continue in the future, and it is a priority area for committee chairman Senator Max Baucus (D-MT). He noted that committee staff will be looking for help in how to implement pay for performance in the emergency care sector.

Mr. Wynne also said that refinement of DRG codes used in hospital inpatient payment will continue to be on the congressional agenda. Inequities in the DRG payment system may be fostering the proliferation of specialty hospitals, and are another concern of Senator Baucus. The committee will continue to look at the impact of specialty hospitals on community care and on community hospitals.

Another area that is likely to receive more attention in the upcoming Congress is the uninsured. He speculated that there probably will not be any major reforms, but it will be an area of greater focus than in the past.

Turning to regionalization, Mr. Wynne raised the issue of how variations in medical services and volume across the country drive costs and affect the supply of physicians, including specialists and primary care doctors. He said the Medicare Payment Advisory Commission is going to issue a report on the sustainable growth rate formula for physician payment, and he expects it will receive much attention.

Mr. Wynne noted that rural issues are another top priority area for Senator Baucus. He concluded by saying that among the most immediate priorities for the new Congress will be the reauthorization of the State Children's Health Insurance Program.

Open Discussion

Brian Keaton, president of the American College of Emergency Physicians (ACEP), noted that in the six months since the release of the IOM reports, nothing has changed. The IOM did a remarkable job of identifying

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problems, their causes, and solutions. He recommended that stakeholder groups join forces to identify three or four solutions that all groups can agree on and then work with Congress and the regulatory bodies to implement them. Over the next several months, ACEP will organize meetings of committed stakeholders to work toward consensus and develop advocacy strategies. Dr. Keaton also noted that ACEP plans to re-introduce a revised Access to Emergency Services Act that might be a vehicle through which the stakeholder groups can address some common strategies. Ms. Curtis cautioned that the new Congress will be operating on a pay-as-you-go basis. The emergency care bill that Dr. Keaton referred to calls for an add-on payment for ED services, but Congress is not going to authorize spending additional money easily. She also warned advocates to be careful not to make it too easy for Congress to deal with emergency and trauma care by asking for more studies and reorganizing federal positions. She encouraged them to push for real solutions.

Steve Krug, chair of the Committee on Pediatric Emergency Medicine for the American Academy of Pediatrics, noted that there are two ways to address the IOM committee's recommendations: from the bottom up and from the top down. He said that providers can work together more effectively at the grassroots level to improve emergency care and better integrate their processes; however, the majority of the recommendations are targeted at the federal level. He emphasized the need to address the profound fragmentation that exists at the federal level and encouraged the panelists to get the various agencies represented on the previous panel to work more effectively together. Ms. Curtis responded by saying that the problem of fragmentation is not unique to emergency care, and the reality is that fragmentation in health care will continue until universal care is adopted.

Dr. Bass highlighted a strong recommendation in the IOM reports for the creation of a demonstration program to collect information on best practices as they relate to the development of coordinated, regionalized, and accountable emergency care systems.

Professor of surgery Arthur Cooper, representing the American Medical Association and the American Public Health Association, expressed support for the IOM committee's recommendations but noted that an opportunity was overlooked in the reports. He emphasized the need to look at the demand for emergency services and involve the public health system to address prevention issues.

William Schwab, an IOM committee member and immediate past president of the American Association for the Surgery of Trauma, estimated that injuries account for one-third of the 113 million annual ED visits, and 15 or 20 percent of those patients require treatment by surgeons. However, the malpractice risk is driving surgeons away from responding to emergency call. In response, Ms. Curtis said she did not expect the 110th Congress to

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act on malpractice reform, saying that capping damages may not result in a single surgeon being more willing to take ED call. Dr. Bass emphasized the importance of the issue, noting that a trauma center in Maryland closed because the hospital could not secure backup specialists due to liability exposure in the ED.

Dr. Degutis noted that EMS authorization and appropriations cut across the jurisdictions of a number of congressional committees. She asked the panelists how congressional committees would coordinate a legislative response to the IOM reports and avoid overlap and duplication of effort. Mr. Wynne predicted increased communication channels among the various committees, in part due to participation on the workshop panel. In addition, he noted that coordination also depends in part on the emergency care community being unified in its message to policy makers and assisting congressional staff to stay informed of other ongoing efforts.

Response from Representative Pete Stark (D-CA)

Representative Pete Stark, incoming chair of the Health Subcommittee of the House Ways and Means Committee, said the IOM reports describe a lot of problems, many of which may not really exist, but the reports do not offer many solutions. Regarding the recommendations that pertain to JCAHO, Representative Stark encouraged the IOM committee to "not waste your time" with JCAHO, describing the organization as "a useless, toothless tiger."

Representative Stark said that someone at CMS recently made a determination that EMTALA does not apply to a child of illegal parents. He called that construction of the law "obscene and immoral." He said he wrote EMTALA with the idea that the ED would be a place of last resort where people could go for treatment, and the idea of denying that to children is abhorrent.

Regarding the on-call specialty issue, Representative Stark pointed out that physicians receive a huge taxpayer subsidy to attend medical school and that occasional service in the ED is part of a physician's job. He noted that some specialists make more than $400,000 a year, and for them to refuse to provide care in the ED is not right. He warned that Congress could change the conditions of participation for Medicare to forbid hospitals to allow admitting privileges to any physician who does not agree to serve time as needed in the ED.

Regarding disaster preparedness, Representative Stark said that he thinks terrorism receives too much attention, in part to keep Republicans in power. He noted that California has fires and earthquakes and floods. It struggles with personnel shortages and communications problems, but the state makes do. One solution, which he acknowledged might not be popu-

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lar, is to rely more heavily on the National Guard. Conceivably, surgeons could be required serve time in the National Guard if needed to staff field hospitals. If medical help was needed in New Orleans, the National Guard from Texas or Alabama could respond. He argued that this may be more effective than having every hospital across the country focus on terrorism.

He was also dismissive of concerns over hospital closings. The hospital industry has for years warned that hospitals are closing, but, according to Representative Stark, "Hospitals don't close in this country." There may be mergers and reconstruction, but hospitals rarely close.

Finally, the congressman discussed three principles for reforming health care in the United States. First, everyone in the country should have a right to medical care. Second, all providers should be reasonably compensated for their services. And third, patients should contribute based on their ability to pay. He expressed his strong support for universal health care.

Open Discussion

Judd Hollander, president-elect of the Society for Academic Emergency Medicine, clarified that the problem of ED overcrowding is due not only to uninsured patients seeking care; overcrowding is also caused by insured patients being referred to the ED by their primary care physicians. Representative Stark responded by saying that he believes primary care physicians are underpaid and addressing reimbursement issues might alleviate some of the problem.

Kenneth Gummerson from Anne Arundel Medical Center made a similar point to that of Dr. Hollander: the problem of ED crowding and boarding described in the IOM reports is not a result of uncompensated care.

Michael Williams, District of Columbia Fire and EMS, raised a similar issue, emphasizing the need to improve the infrastructure for primary care, particularly for the poor. Representative Stark replied that his hometown has learned how to accommodate residents by expanding clinic hours and suggested that a similar strategy may work elsewhere.

Edward Cornwell, a surgeon who takes ED call, speaking for the Committee on Trauma of the American College of Surgeons, said that physicians who have $100,000 of debt and have malpractice premiums that exceed their mortgages are not going to be moved by those who suggest they have a duty to provide ED call at night for patients who are disproportionately uninsured. He asked if Representative Stark would be open to supporting tax incentives for specialists who provide uncompensated care on their own time. Representative Stark said that the debt physicians carry from medical school will prove a great return for them, and providing care in the ED is part of the duty of specialists with hospital admitting privileges. He also added that he does not support tort reform.

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Response from Consumer and Purchaser Groups

Jane Knapp, professor of pediatrics at Children's Mercy Hospital at the University of Missouri at Kansas City School of Medicine and moderator of the panel, opened the session by summarizing the findings from a 2004 Harris poll on trauma care. Among them: (a) 1 in 3 Americans believes the nearest hospital is a trauma center; in reality, fewer than 8 percent of hospitals have trauma centers; (b) nearly 9 in 10 think it is extremely or very important for an ambulance to take them to a trauma center in case of a life-threatening injury, even if it is not the closest hospital; (c) the majority of Americans feel that having a trauma center nearby is at least as important as having a fire department or a police department; and (d) Americans are willing to spend their own money to have trauma centers and systems in place in their state.

Panelists included Helen Darling, president of the National Business Group on Health; Joyce Dubow, senior adviser in policy and strategy for American Association of Retired Persons; Bruce Lesley, president of First Focus; Brian Lindberg, executive director of the Consumer Coalition for Quality Health Care; and Bill Vaughan, senior policy analyst at Consumers Union.

Ms. Darling presented the employer's perspective. Employers, particularly large organizations, are well aware that the use of hospital EDs has increased dramatically and is straining capacity to a breaking point in some places. Employers know that many visits to the ED are made by people who may not have access to primary care or lack health care coverage. The cost of health care in this country (averaging $8,400 per active employee—the highest in the world) leads some employers, mostly small firms, to stop providing health insurance. Cost increases have made employee cost-sharing high enough to cause some employees, especially low-wage workers, to not cover their children or to not even take the coverage offered to them.

These problems can be fully resolved, Ms. Darling said, only when all residents have health care coverage or access to health centers or other ways to obtain primary and urgent care. There are many reasons to provide coverage for the uninsured; the ED crisis is one more argument for universal coverage.

The problems of ED use should be addressed with a strong public information campaign, careful design of financial disincentives for inappropriate use of EDs, improved access to primary care and urgent care, and payment reforms that increase access to primary care and useful alternatives (e.g., e-visits, tele-help lines, and urgent care centers). Solutions, Ms. Darling added, cannot be enacted without political leadership. To gain public support and change individual behavior, we have to answer the question "What's in it for me?" and disseminate the answers broadly and repeatedly.

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We also have to demonstrate that the funds to pay for correcting the faults of the system lie in the waste and productivity losses we already pay for.

Ms. Darling maintained that the quality of life of patients, families, health professionals, and the entire population is already being seriously compromised, and we must act on the IOM recommendations without delay. Large employers, she said, have reason to support reforms that reward more efficient, effective, and evidence-based health care and cost-effective coverage for all residents.

Ms. Dubow spoke about emergency care issues for older Americans. She said that the changing demographics, notably the doubling of the population over 65 by 2030, will affect emergency care and disaster planning. It will result in far more visits to EDs by older people, who already are almost five times more likely use the ED than younger people. They are also much more likely to be transported to the ED by ambulance.

Older people spend more time in the ED than younger groups. The work-up is more complicated, their disorders and diagnoses are different, and they use more medications. The opportunities for mistakes are greater. Complicating these challenges are issues of comprehension, Ms. Dubow said. Older people have less health literacy than younger people, a fact that complicates communication and exacerbates problems of understanding and following directions. One-quarter of nursing home residents are transported to an ED at least once a year, and two-thirds who present have cognitive impairments.

With regard to disaster planning, Ms. Dubow said that the vulnerabilities and special risks older people present challenge the system. They are more likely to have chronic illnesses, disabilities, and functional limitations. As people age, they lose their confidence in their ability to evacuate. Disaster planning requires registries, access to medical records, medication lists, and special needs lists. Tracking systems are needed to locate and identify older people during disasters and to coordinate emergency responses, she said. The current systems are just not prepared to deal with the challenges that older adults present. Emergency care staff are not sufficiently trained in geriatrics, which is not a problem restricted to the ED. There is clearly a shortage of geriatricians in the United States.

Ms. Dubow described a recent article by the Society for Academic Emergency Medicine (SAEM) that points out that the challenges of and recommendations for the pediatric population also apply to the geriatric population. For both groups, standards are needed for triage and transport of patients, and emergency care workers, including EMTs, need more geriatric training. The article called for improved care in EDs by applying the same accountability agenda to them as to the rest of the health care system—performance assessment and measurement, public reporting, quality improvement, health information technology, and financial incentives

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for improvement. SAEM also recommends broad reforms—coordination, addressing fragmentation, and uniform standards—and the development of an information infrastructure.

To conclude, Ms. Dubow said that special skills and unique resources are necessary for the geriatric population. Care coordination is critical and information is key to effective care for older people.

Mr. Lesley spoke on emergency care for children, and he praised the IOM committee's focus on pediatric-specific issues. He described the pitfalls and failures of the emergency medical system for children. For example, parents do not know whether they should take their children to the closest hospital or to the children's hospital. There are misperceptions about the neighborhood hospital, and there is no standard designation of EDs, particularly for pediatric care. Parents have no idea that 6 percent of EDs lack the supplies needed to treat children. Futhermore, it appears that in many cases, the EMS system does not transport patients to the most appropriate ED; the geographic boundaries of EMS catchment areas often limit where ambulances take patients.

Mr. Lesley said that he wished some of the recommendations in the IOM report on pediatric care—particularly those that call for expert panels to develop strategies to address pediatric needs—were stronger. He also had hoped the IOM would issue a clarion call announcing that, for the first time since 1997, the uninsured rate for children has risen. Nowhere is this felt more urgently than in the EMS system. Lack of insurance results in 18,000 deaths per year, according to a previous IOM study.

Mr. Lesley said that he was committed to working to implement a variety of the recommendations in the report, including the call for increased funding for the EMS-C program. He said he would also raise the attention of Congress to the need for DHHS to conduct studies on the efficacy, safety, and health outcomes of medications used for children in the emergency care setting.

He expressed concern about the impact of the Deficit Reduction Act on Medicaid patients, which allows for additional cost-sharing for ED use. He noted that some families covered by Medicaid have no other way to get to a doctor than to use an ambulance to reach the ED. More research may be required to examine the impact of copayments on the use of emergency services and health outcomes.

He closed by urging two changes to Medicare. First, although only a small fraction of children are covered under Medicare, a critical reimbursement problem is that the payment rates do not reflect the considerable work effort involved in providing emergency services to children. In addition, certain neonatal or pediatric critical care services, preventive care, some vascular care, immunizations, and sedations are not reimbursed. Since Medicare payment serves as a model for other payers, this issue must be

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addressed. He urged Congress to hold hearings on this matter. Second, he noted that the current Medicare disproportionate share hospital (DSH) formula serves as a deterrent to hospitals to provide uncompensated care, because doing so results in reduced payments. MEDPAC issued a series of recommendations for revising the formula to add uncompensated care as a factor in the formula for DSH, and Mr. Lesley said that Congress should consider those recommendations.

Mr. Lindberg spoke about consumers' awareness of the problems in the emergency care system. He said that even with all the publicity given to the IOM reports, he doubts that consumers realize the dismal state of emergency care. If the previous IOM studies on medical errors and quality are indicators of the public's outcry for change and congressional action, he said, "we have our work cut out for us." He also added that those reports received more coverage than the reports on emergency care.

He highlighted the recent Harris poll on trauma care as an example of the lack of consumer awareness. The public does not recognize how many people die of injuries, and they do not realize how important emergency care is. There is also a public misconception about the accessibility of trauma centers. Mr. Lindberg argued that if the public was educated on the issue, they would understand the urgency of the problem and would be willing to help address it.

Mr. Lindberg also addressed how to engender public support for the IOM committee's recommendations. Many of them—for example, expanding reimbursement for clinical decision units—are not easily marketed to consumers. Consumers have not actively pushed for higher DSH payments or better use of information technology. Therefore, many of the recommendations need to be packaged together in a bill under the guise of something more urgent to consumers, "The Emergency Medicine Improvement Act of 2007" or the "Save a Million Lives Bill."

Mr. Lindberg noted that consumers and Congress may relate more to the findings and recommendations on disaster preparedness, and it should be the cornerstone of any public awareness effort. The shortages of emergency and trauma physicians in rural areas may also be used to gain congressional support, since many members of Congress represent rural districts. Consumer groups would be more likely to be engaged in advancing the IOM committee's recommendations if the issues were explained in terms of lives saved and if they were paired with a strategy for moving the recommendations forward.

Like Ms. Darling, Mr. Lindberg called for more public education for consumers about how to use emergency services. Consumers should have access to brochures, websites, and other easily understood information.

He concluded by saying that inappropriate use of the ED could be addressed with a system that provided universal coverage and ensured access

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to care in the proper setting. He also noted the need to measure quality and consumer satisfaction in ED settings and report the information back to providers and consumers in a comparable, publicly available way.

Mr. Vaughan emphasized that health care reform will never advance until middle America sees it in their self-interest to do so. He encouraged future research efforts to investigate how many people die as a result of poor emergency care services and what type of individuals have increased morbidity because of boarding and diversion in order to increase public attention to the issues.

He noted that Consumers Union readers tend to be insured, but fear that insurance is becoming unaffordable. American consumers get a terrible deal for their health care dollars, and consumers ought to be angrier than they are. He said that he hopes that Consumers Union can build on the IOM's recommendation to identify tougher solutions to the emergency care problems without asking for more funding.

A key unaddressed issue in the IOM reports, Mr. Vaughan said, is specialty hospitals. He suggested creating a surcharge on any hospital participating in Medicare or Medicaid that is licensed to do surgery but does not operate an ED. The funds would then go to a pool for uncompensated ED care. The surcharge would be an amount that would make hospitals think twice before opening without an ED.

He also suggested revising Medicare's conditions of participation to require that by a certain date—5 or 10 years from now—hospitals must adopt the IOM committee's recommendations. He also suggested that hospitals receive no more Medicare prospective capital payments in a year or two from now, unless they comply with the IOM committee's recommendations for negative-pressure rooms and health information technology. To improve EMS quality, he advised that requirements for Medicare's 2 percent update should include reporting of emergency care quality measures.

Mr. Vaughan agreed with Representative Stark with regard to the on-call issue. Taxpayers spend billions on direct and indirect medical education subsidies, and some specialists go on to make 10 times the median income in the United States. If specialists are not willing to be on call to repay the funding they received from taxpayers, then taxpayers should find a way to recoup that investment.

Open Discussion

Dr. Keaton raised two points. First, the problems facing EDs, namely crowding and boarding, will not be addressed by removing the patients who "don't need to be there." The people in ED beds awaiting placement in the hospital are very sick. But there is a shortage of inpatient hospital beds and a growing physician and nurse shortage. Second, he expressed concern

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about calls for financial disincentives to deter patients from seeking care in the ED. A hospital is not going to be able to collect $100 copays from ED patients. If payers decide that they want to create a financial disincentive to ED use, then the copay should be deducted from a person's pay. The incentive structure should not punish hospitals. EDs are obligated by law to provide services to patients, and hospitals will not deny care to patients.

Marian Smithey of the National Association of School Nurses spoke about how school nurses are often overlooked when community and national planning is conducted. School nurses care for vulnerable populations every day and serve as first responders, providing some prehospital care. They conduct disease surveillance and can draft emergency care plans for schools. She encouraged attendees to include school nurses in disaster planning.

Brenda Staffan, a board member of the American Ambulance Association, asked for elaboration on the notion of scaring people through public education in order to raise attention to the issues. It is difficult for providers to use scare tactics when they have made a promise to their communities to serve as a safety-net provider. Ms. Darling said the message should come from public officials who will make the facts known to the public. She also expressed confidence that when most people learn about emergency care and see it as a public good, they will behave in a responsible way and use it appropriately.

Dr. Moises paid tribute to the Public Health Service's response to Hurricane Katrina. Additionally, he said that the state of Louisiana is going to identify hospitals that meet standards for taking care of pediatric emergencies. He asked if any of the panelists were doing anything to raise public awareness that not all EDs are the same, and some are better staffed and equipped for pediatric care. Mr. Vaughan said he could not commit Consumers Union to that yet; however, he noted that the IOM reports caused some ferment within the organization for emergency care scorecards. Consumers Union created scorecards for hospital infections, which he believes contributes to hospitals putting energy into addressing the problem.

CHALLENGES AND OPPORTUNITIES IN EMERGENCY CARE RESEARCH

The final sessions of the afternoon focused on emergency care research issues. The moderator, Art Kellermann of the Emory University School of Medicine, opened the panel with a brief story of a recent patient encounter one night at Grady Memorial Hospital, a level 1 trauma center in Atlanta. On this particular night, not an unusual one, there were over 100 patients in the waiting room, and many patients lay on stretchers awaiting transfer to an inpatient bed. One of the patients in the waiting room came to the

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ED seeking a medication refill for her antihypertensives because she had severe accelerated hypertension. She had been waiting in the ED for 11 or 12 hours. She said that she had gone to six clinics before coming to the ED. Staff at the last two clinics told her that if she wanted to get her medication she had to go to the ED. Dr. Kellermann emphasized that efforts to educate the public on how to use the emergency care system will not work in the absence of an accessible primary care system.

Emergency Care Researchers

Three emergency care researchers were invited to speak about the challenges and opportunities involved in emergency care research. Panelists included William Barsan, professor and chair of the Department of Emergency Medicine, University of Michigan; Nathan Kuppermann, professor in the departments of Emergency Medicine and Pediatrics and chair and director of research of the Department of Emergency Medicine, University of California, Davis, School of Medicine; and Daniel Patterson, research associate at the Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill. They addressed hospital-based research, pediatric emergency care research, and EMS research, respectively.

Dr. Barsan described several opportunities in hospital-based emergency care research. EDs treat high-impact conditions that are leading causes of death and disability, including trauma, cardiovascular disorders, sepsis, and stroke. The outcomes of these illnesses and injuries are often determined by the care received in the very earliest stages. With stroke, "time is brain," with myocardial infarction, "time is muscle." Also, EDs offer access to large and very diverse patient populations; everyone tends uses an ED at some point in their lives.

Dr. Barsan noted that ED physicians are an underutilized resource for research. They have demonstrated academic interest and have a unique perspective on certain conditions. For example, ED physicians have a different perspective on stroke than many neurologists, and there are things that the two disciplines can learn from each other. They also have the ability to collect very meaningful surveillance data in the ED, none of which are currently being used to any great degree.

As for challenges to hospital-based emergency care research, there are many. Dr. Barsan noted that the infrastructure for training researchers in emergency medicine is very limited. There are few research fellowship training positions and few trained researchers. He noted that there has never been a K-12 award to a department of emergency medicine, adding that the NIH does not fund such research because of a mission mismatch. Emergency medicine covers a broad spectrum of conditions, while the NIH institutes are more narrowly focused. A search of the NIH Roadmap

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Initiative found no mention of emergency care, and emergency care is not mentioned in the description of the new clinical and translational science awards (CTSAs).

Other important deterrents to ED research include ED overcrowding and the unscheduled nature of the research encounter. Investigators are needed 24/7, which is different from other fields. Lack of standard electronic medical records and limited manpower and space are also problems.

Consent issues are another important barrier. The barriers to conducting research on such conditions as cardiac arrest without informed consent seem to be growing. There has been a lack of federal leadership in the area of public and institutional review board (IRB) education. Federalwide assurance is focused on institutions rather than investigators and impairs community access.

Until recently there has been a lack of clinical research networks, and most have been developed at the grassroots level. He cited one research network, the Neurological Emergencies Treatment Trials, funded by the National Institute of Neurological Disorders and Stroke (NINDS). It seeks to achieve economies of scale to do acute studies with interdisciplinary trials on patients with all types of neurological emergencies.

According to Dr. Kuppermann, compared with adults, much less is known about the treatment of life-threatening pediatric injuries and illnesses, such as cardiac arrest, shock, and drowning. Broadly speaking, more information is needed to assess pediatric emergency care on the IOM's six aims of quality: how safe, effective, patient centered, timely, efficient, and equitable is pediatric emergency care?

To address these gaps, several barriers must be overcome besides inadequate funding for research: (1) the limited data on pediatric cases in registries, especially prehospital and trauma registries; (2) the lack of trained investigators in pediatric emergency care; (3) the pressure to achieve clinical productivity in the ED and its chaotic environment; (4) the unique epidemiology of pediatric emergency events—adverse outcomes are rare, making research difficult. Investigators need to pool data to get sufficient diversity to generate generalizable findings; (5) the complexity of obtaining informed consent in the ED; and (6) a lack of an appropriate infrastructure prevents research collaboration between prehospital, ED, hospital, and rehabilitation settings.

Dr. Kuppermann emphasized the need to expand multicenter research, where data from a number of hospitals are pooled to improve sample size. Infrastructures are needed to test the efficacy of treatment, to test the efficacy of transport and prehospital care, and to promote collaboration, and a mechanism is needed to study the transfer of research results to treatment settings. One multicenter research network is the Pediatric Emergency Care

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Applied Research Network (PECARN), a 21-hospital network that sees 900,000 children.

One challenge for multicenter research, Dr. Kuppermann said, is funding; such studies are expensive. Investigators need to advocate for congressional funding and a dedicated institute in NIH. Another challenge is that the sharing of information in multicenter research networks is complicated by the IRB process. Each institution has its own IRB with different guidelines. He observed that sometimes you need 25 IRBs to agree on a protocol.

Making findings from multicenter networks generalizable is another challenge. Most research is conducted at pediatric centers, but more than 90 percent of pediatric emergency care is provided at general hospitals. More hospitals need to be incorporated into research. Community practitioners should be trained in basic research principles and hospitals given incentives to participate in multicenter research.

Turning to research goals, Dr. Kuppermann noted the variations in emergency care among the community hospitals that see the great majority of children. He emphasized the need to identify factors associated with inequities and solutions to them. A key solution is finding better ways to maintain skills in providers who do not see children frequently.

Dr. Patterson spoke on prehospital EMS research and began by describing a list of challenges to research identified by his peers: a paucity and lack of uniformity of data, obtaining consent, few funding opportunities, no real home for EMS research, limited NIH knowledge and awareness of EMS, and few trained EMS researchers. This list is very similar to the challenges identified in the National EMS Research Agenda.

Unlike researchers who can rely on the many public use datasets already available in the health care field, EMS investigators have to create their data from various sources or conduct primary data collection. Dr. Patterson illustrated this challenge with his dissertation, in which he sought to identify the prevalence of medically unnecessary EMS transports of children by collecting ED and EMS data. He ran into so many challenges that it took him 12 months to create a dataset. By comparison, a student colleague obtained and analyzed a public-use dataset and wrote the results section of his dissertation—all in three months.

Dr. Patterson described two opportunities for improving EMS data for research. The National Registry of Emergency Medical Technicians has a strong history of collecting workforce data on EMTs and paramedics. If the registry had the capacity to collect data on nonnationally registered EMTs, it would allow researchers to conduct more meaningful studies on the EMS workforce. Also, the NEMSIS project is a central repository for state EMS databases, and one day its data will be used to answer questions about response times and model designs.

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Regarding informed consent, he noted that the blood substitute Polyheme has sparked a good deal of public controversy. The Food and Drug Administration (FDA) decided to hold hearings to determine if the current informed consent framework, known as the final rule, is adequate or needs modification. Those who have written on the issue appear to believe the final rule is too broad and better guidance is needed. The consensus reached by the Resuscitation Outcomes Consortium may help the FDA refine that language. This presents an opportunity to improve the ability of emergency physicians or those in prehospital care to do research in emergency situations.

Other key challenges, including lack of appreciation for research among EMS professionals, the lack of skilled researchers, and inadequate funding for research should be discussed in terms of creating a viable EMS research career path for clinicians and doctorally trained researchers. Unlike researchers who focus on major diseases, EMS investigators have few opportunities for postdoctoral training or even dissertation-supported research and even fewer opportunities to find an academic home doing EMS research.

Still, Dr. Patterson said, there are a few funding opportunities for EMS research. One place to look is the NIH Roadmap Initiative, which focuses on training researchers to be multidisciplinary and encourages involvement in community-based research. If NIH and the academic institutions that support emergency medicine research would recognize EMS as a vehicle for improving and increasing community-based research, it would help a great deal. As for systems-level research, many federal agencies have the capacity to support a competitive grant program and demonstration projects focused on EMS systems and workforce research. The question, Dr. Patterson concluded, is who at the national level (i.e., federal agencies and associations) will take the lead and promote opportunities for EMS research.

Open Discussion

Lisa Myer of Cornerstone Government Affairs, which represents Advocates for EMS, said that NEMSIS funding is a top agenda issue for the group. She urged attendees to write letters to members of Congress in support of funding for NEMSIS.

Robert Neumar, chair of the ACEP Research Committee, asked if the panelists had ideas on how advocates could work with the government to build a research training infrastructure for emergency care, aside from the NIH Roadmap Initiative. Dr. Patterson responded, noting that the National Registry of Emergency Medical Technicians, perhaps with support from NHTSA, provides funding for two research fellows at Ohio State University, and the fellows are housed at the National Registry. That is one example,

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and it could be applied to other organizations. Dr. Barsan added that the ACEP Research Committee has developed many solid recommendations in this area. He also noted that there has been some talk about an initiative to create a home for emergency medicine that spans multiple institutes at NIH rather than creating a specific institute for emergency medicine research.

Response from Federal Agencies Involved in Emergency Care Research

Representatives from several federal agencies were invited to discuss their reactions to the research findings and recommendations in the IOM reports as well as from earlier panels. Panelists included Chris DeGraw, deputy director of the Division of Research, Training and Education at the Maternal and Child Health Bureau (MCHB) of HRSA; Irene Fraser, director of the Center for Delivery, Organization and Markets at the Agency for Healthcare Research and Quality (AHRQ); Richard Hunt, director of the Division of Injury Response at the Centers for Disease Control and Prevention's (CDC's) National Center for Injury Prevention and Control; Major Chetan Kharod, an Air Force major, emergency physician, and assistant professor in the Department of Military and Emergency Medicine, Uniformed Services University of the Health Sciences (USU); and John Marler, associate director for clinical trials at the NINDS.

Dr. DeGraw described how the MCHB's research program funds extramural, investigator-initiated research that covers a number of topics and issues and different types of research; its annual budget is $10 million. It reviews 90-100 applications annually, makes 8-10 new awards a year, and has a portfolio of 40-50 active projects at any one time. Currently, two projects are related to pediatric emergency care. The bureau also provides some core funding for three research networks, including PECARN.

The bureau is also part of the Interagency Committee on EMSC Research. It began in the mid-1990s to raise the quality and quantity of research on EMS for children by integrating the topic into federal research agendas. One way the committee has sought to do this is through joint research announcements. Collaborating agencies include the MCHB, CDC, AHRQ, and several of the institutes at NIH.

PECARN is the first federally funded research network focused on pediatric emergency care. Its purpose is to develop an infrastructure capable of overcoming barriers to pediatric EMS research. Its mission is to conduct high-priority, multi-institutional research on the prevention and management of acute illnesses and injuries in children and youth of all ages. It represents a collaboration at the MCHB between the EMS-C program and the research program. PECARN promotes multicenter research (investigators still must find their own research funding), supports collaboration among investigators, and encourages informational exchanges.

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PECARN is operationalized through five cooperative agreements with the EMS-C program that support a centralized data management coordinating center at the University of Utah and four research nodes at academic centers across the country, each of which hosts a regional network of hospital EDs, creating 21 research sites in all. A steering committee reviews and approves PECARN research proposals.

Dr. DeGraw added that future plans for PECARN include finalizing and implementing a formal agenda to guide future research proposal development, designing a plan to encourage the transfer of network findings to practice, and improving collaboration with practitioners and researchers to enhance the two-way education and the exchange of ideas and information between the treatment and research communities.

Dr. Fraser said improving emergency care is going to require systemwide solutions, so research must focus on systems, too. That will require strong, linked data on robust measures, evidence of how to improve the care systems themselves, and systematic collection and implementation of the evidence.

A DHHS study recently found 91 data sources with information on emergency care and preparedness, including two highlighted extensively in the IOM reports: CDC's National Hospital Ambulatory Medical Care Survey and AHRQ's Healthcare Cost and Utilization Project (HCUP). However, the study also found that better linkages and coordination across data systems, much better data capacity, and strong quality measures are needed. These are the areas of interest for AHRQ, which is not focused on any specific diseases, but rather on health systems research.

HCUP now has 37 state partners through whom it collects and standardizes all hospital discharges in those states. HCUP contains 90 percent of all discharges in the country, which amounts to a detailed census of inpatient hospital care. It also includes ambulatory surgery and ED services from a growing number of states.

Using inpatient data from HCUP, researchers have information on patients who enter the hospital through the ED. The data allow analysis of the clinical conditions that lead to admission, and one of the findings of an AHRQ research study is that half of uninsured inpatients are admitted through the hospital from the ED; one-fourth of privately insured patients are admitted through the ED. The inpatient data have been used with an array of quality indicators that the agency has developed. The measures are now used for public reporting in nine states.

A new emphasis for AHRQ is on the HCUP ED data. Currently 22 HCUP partners provide ED data in their states, and several more states plan to participate in the future. Going forward, Dr. Fraser said that AHRQ is working to expand the ED data to create a national ED dataset, and in the next few years will start production of ED quality indicators.

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Dr. Fraser also highlighted research in practice-based organizations that AHRQ is supporting. Accelerating Change and Transformation in Organizations and Networks (ACTION) consists of 15 very large provider-based consortia that conduct applied practical research through task orders with AHRQ. ACTION includes most hospitals and physician practices in the country. There is considerable volume and diversity in these settings, and, most importantly, they enjoy considerable buy-in from their operational leadership. Dr. Fraser added that if a group of EDs from around the country wanted to collaborate, they would probably find that they are already in the network.

Finally, Dr. Fraser mentioned two opportunities for research support from AHRQ. The agency recently posted a special emphasis notice on research to improve health care systems, and ED care is specifically mentioned. Also, the agency recently posted new grant opportunities focused on health information technology and safety in the ambulatory care arena, and ambulatory care is specifically defined to include ED care.

Dr. Hunt addressed acute injury care research. The IOM committee called for the secretary of DHHS to undertake a study to examine gaps and opportunities in emergency care and trauma research, and CDC recently undertook a similar effort to revise its injury research agenda. A multidisciplinary process was used to examine gaps and create an agenda for acute injury care. The process involved representatives of other federal agencies and the corporate sector to make sure that the effort was complementary and not redundant with other efforts.

The resulting research agenda priorities identified were translation of research into practice; treatment; disasters; on-site interventions; outcome measures; and individual, cross-cultural, and community outcomes. Dr. Hunt described several efforts to begin work on the research agenda. First, intramural research is under way, for example, to examine bomb injuries and international lessons learned from explosion injuries. CDC is also conducting a cost-benefit analysis of the traumatic brain injury treatment guidelines.

Second, CDC is awarding grants for research on the care of the acutely injured. It received 38 grant proposals that were equally distributed among the priority areas. Four proposals were funded on the following topics: pediatric injury–posttraumatic stress disorder, trauma outcomes improvement, children and blunt abdominal trauma, and the mechanism of injury in field triage. These awards were developed collaboratively with other federal agencies.

Dr. Hunt emphasized that CDC is also addressing other recommendations from the IOM committee. With regard to the committee's call for emergency and trauma care research for prehospital EMS with an emphasis on systems and outcome research, Dr. Hunt said that CDC is looking at

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the entire system, not just operating rooms, trauma surgery, and EDs; their work is inclusive of EMS, and they have worked hard to be complementary to the initiatives developed in the National EMS Research Agenda. Also, as called for in the IOM reports, the CDC is placing a growing focus on high-probability disaster events.

Dr. Hunt concluded by noting that CDC is working to address acute injury research with its federal colleagues from the Department of Defense (DoD), the Department of Transportation, and DHHS.

Major Kharod spoke about the unique issues in military emergency care research. He began by distinguishing medicine in the military (for troops at home) from military medicine, which is practiced during military operations. While medicine in the military is similar to the civilian practice of emergency medicine, military medicine is a very different discipline, one that involves austere environments, resource limitations, and a lack of physical security.

He noted that the role of military medicine is expanding from the provision of compassionate and competent care to also include public health and preventive medicine, humanitarian disaster response, and field research. There are opportunities for the military to contribute to advances in civilian practice. The golden hour and the use of blood substitutes are examples of developments from military research. Major Kharod discussed the barriers to military research, which include strategic, operational, and tactical barriers. Strategic barriers refer to the mind set about research. While research is part of DoD's mission and a number of military institutes are involved in research, its value to different groups varies. It is highly valued by combat commanders who want to ensure that their troops return home safely. Academic centers have a moderate interest in research, but military medical treatment facilities have less interest in conducting research.

Operational barriers to conducting research include the multidisciplinary nature of emergency medicine research, enrolling research subjects, and obtaining informed consent waivers. Informed consent waivers require approval from the secretary of defense. Tactical barriers include the high operations tempo, lack of physical security, and staffing issues, all of which make it difficult to conduct research.

However, USU is good at developing multicenter research teams that involve its staff and its teaching hospitals, military medical centers, DoD research facilities, and civilian facilities. It is also good at improving research collaboration between civilian and military researchers, various medical specialties, the military services, and among the medical corps. Looking forward, USU can potentially serve as an interagency hub for research, providing protected time and funding and training for researchers. It could also be a conduit of military research and operational education. It could also

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expand the presence of emergency medicine in the university by developing a core faculty and research base.

Dr. Marler described two major projects that demonstrate how emergency medicine can help in the development of clinical treatments. The Special Program of Translational Research in Acute Stroke (SPOTRIAS) began five years ago when the NINDS noticed a lack of new treatments for stroke under development. SPOTRIAS involves seven national centers that take promising treatments and develop them in pilot studies. The centers are required to work in close cooperation with EDs. Of the 12 fellowships at the centers, 2 are held by emergency physicians.

While the SPOTRIAS is focused on pilot programs, a second effort is under way to conduct phase III studies. NINDS developed the Neurological Emergencies Treatment Trials (NETT) to conduct multiple trials in multiple diseases. NETT involves several hub centers and has a coordinating center at the University of Michigan. NINDS requires that emergency physicians participate in the leadership at the hub sites. An emergency physician is the principal investigator at the majority of sites, and the principal investigator at the coordinating center it is Dr. Barsan. Going forward, the vision for NETT is to engage clinicians and providers at the front lines of emergency care to conduct large multicenter clinical trials to answer research questions of neurological importance. The NETT structure will be utilized to achieve economies of scale enabling cost-effective, high-quality research. NINDS has evolved to realize that if they are going to get patients that they need in their trials at a time when the patients can respond to treatment, they need not only to work with emergency physicians, but also to have them participate in the design and leadership of the studies.

Dr. Marler concluded by describing some of the special challenges associated with research for neurological emergencies. One is urgency: patients must be recruited into studies in minutes, not hours. Another is the need for multidisciplinary involvement throughout the medical care system from EMS to rehabilitation. And third, conditions in the ED complicate informed consent.

Open Discussion

Dr. Kellermann pointed out that while emergency care accounts for some 43 percent of all hospital admissions and 11 percent of all outpatient encounters, only one-half of 1 percent of health care research dollars are targeted to emergency care research, according to one study. How, he asked the panelists, might the issues involved in emergency care research be more effectively constituted to obtain a bigger share of research dollars? Dr. Marler said one key message he heard during the meeting was that any shift in funding is a zero-sum game, so efficiencies have to be identified to have

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additional funding. NIH is trying to focus its research on practical and important issues that will lead to savings in lives and money. Dr. Hunt added that strong numbers, such as the ones that Dr. Kellermann provided, help make the case for more research funding. In addition, cost-benefit analyses of treatment may be able to demonstrate improved health outcomes and monetary savings, which could lead policy makers to support emergency care research. Dr. Fraser added that research should be coordinated—in other words, a study on health information technology can also provide useful findings on emergency care.

Ms. Bonalumi said the Emergency Nurses Association Foundation has collaborated with ACEP to cosponsor research, and it has proved to be a very valuable partnership. Physicians and nurses collaborate every day at the patient's bedside to deliver care, she reminded attendees, and emergency nurses can and should participate in developing research agendas. Dr. Kellermann concurred, noting that a brain injury study at Emory University could not have been possible without the help of both emergency and intensive care unit nurses.

Tammy Estrada, a senior nurse at Memorial Health University Medical Center in Savannah, said that senior leadership from her hospital believed in the IOM reports so much that they sent a delegation to the workshop with the hope that they would return with a plan to support ED improvement efforts. She said during the course of the day she learned that CMS is unlikely to make many changes to Medicare reimbursement, Congress wants more specific recommendations to act on, outside agencies may need to be employed to raise public awareness, and more research in emergency care is needed. What, she asked, should she tell her hospital's senior leadership about the next steps to support the IOM's agenda?

Dr. Kellermann agreed that those were messages heard during the day, but there were many other positive developments. Many of the key health staffers in Congress were present and engaged in conversation, and one of the most powerful legislators in Congress participated in a discussion of emergency care issues after most other members had left town for recess. He also said that in 20 years he has never seen a similar collection of individuals in the same room to discuss emergency care issues. He encouraged attendees to build on the momentum, working collaboratively to pressure Congress for action. Mr. Sanddal added that the concepts of coordination, regionalization, and accountability can start at home. Providers can look for opportunities in their own health care delivery system to figure out how to better serve patients in their catchment area by working collaboratively with other organizations and other disciplines.

Dr. Neumar said that, in the current fiscal climate, an emergency care institute or center at NIH seems impossible. He asked for panelists' reactions to the potential short-term solution of an office in the Office of

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the Director at NIH that would be responsible for coordinating efforts in emergency care and improving research in NIH. Dr. Marler said that such an office might be useful, but he added that the crux of the problem is really a data collection issue. Most of the research dollars that NINDS provides goes into paying people to collect data that have already been collected, sometimes three or four times, and there are incredible translational problems. Each center in the NINDS network uses different data collection methods. Just as the federal agencies cannot talk to each other, in terms of data, individual emergency physicians working in different departments or academic centers cannot communicate, either. If emergency physicians from different departments or centers would organize to improve data transmission and communication, they would be ahead of the rest of medicine.

Dr. Kellermann asked about the possibility of a FICEMS-like committee for emergency care research across agencies and institutes, in which agencies could pool resources and ideas. Major Kharod responded in full support of the idea, noting that waiting for the "100 percent solution" would take too long. He suggested undertaking the 75 percent solution and improving it as it moves forward.

Dr. Williams said that a stronger case for federal funding could be made if the resulting research outcomes could be used to prevent traumatic brain injury, thereby resulting in monetary savings. Dr. Hunt agreed that prevention is an important component of the patient encounter in the ED and noted that two divisions in CDC's injury center are prevention oriented. Dr. Kellermann added that emergency care providers are some of the most effective advocates for prevention, because they see what happens when prevention fails. Dr. Fraser noted that prevention is more than individual preventive care. It also includes public policies, for example, helmet laws. Research from AHRQ has found that there are high costs associated with the absence of helmet laws, and much of those costs are borne by the states.

Aisha Liferidge, president of the Emergency Medicine Residents' Association, said that many of its members have expressed interest in practicing in rural areas if a loan repayment program would be offered. The association proposed a resolution to ACEP petitioning that emergency medicine be included in the national health corps scholarships.

Charles Cairns, one of the authors of the ACEP report on research, said that the ACEP report recommended specific training awards for emergency physicians within each institute. He asked Dr. Marler whether the success of the efforts at the NINDS in terms of incorporating emergency medicine research could be leveraged to incorporate similar efforts at other institutes. Dr. Marler said yes. NINDS developed their initiatives because they realized the potential that emergency physicians had to offer to NINDS research. However, he noted that it is not possible to have dedicated awards for every

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specialty. NIH is moving toward CTSAs, which are nonspecialized training programs. He noted that many people at NIH would be enthusiastic to see CTSA applications from emergency care researchers.

Dr. Smithey said that as collaborations between communities and organizations move forward, there is a lot of confusion over the Health Insurance Portability and Accountability Act and the Family Educational Rights and Privacy Act laws in terms of what information people are allowed to share. The confusion over these laws impedes the ability of providers to treat patients.

Dr. Hollander noted that in response to the recent request for information of the NIH Roadmap Initiative, both SAEM and ACEP submitted independent proposals that were similar. Both proposals called for a trans-NIH research network using the NINDS model to promote emergency care and emergency medicine research. He urged the workshop attendees to go to the roadmap website, look at the proposals, and post a public comment, noting that this is an opportunity for NIH to hear from emergency care stakeholders.

Finally, Dr. Degutis raised the suggestion that when research applications are submitted to federal agencies, someone who understands emergency care should be involved in the review process. She speculated that one of the reasons that emergency care researchers do not submit applications or why their applications receive low scores is because the reviewers do not understand emergency care.

CLOSING

Mr. Sanddal closed the meeting, expressing thanks to the panelists, IOM staff, and sponsors of the IOM study and the dissemination workshops. He noted that a strong message from the four dissemination workshops is that it will take collaboration and leadership to continue to move the agenda forward. While there are many "islands of excellence" in emergency care across the country, they are surrounded by "seas of mediocrity." A national agenda, national focus, and national leadership are needed to bridge the gap between the islands of excellence, so that one day a patient's genetic code will be at least equally important to his or her zip code in determining outcomes.

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Appendix A

Workshop Agendas

FUTURE OF EMERGENCY CARE SERIES

REGIONAL DISSEMINATION WORKSHOP

PRIMARY CHILDREN'S MEDICAL CENTER
MULTIPURPOSE ROOM—3RD FLOOR
SALT LAKE CITY, UTAH

September 7, 2006
Workshop Agenda

OBJECTIVE: TO DISSEMINATE FINDINGS FROM THE THREE INSTITUTE OF MEDICINE (IOM) REPORTS ON THE FUTURE OF EMERGENCY CARE (*EMERGENCY MEDICAL SERVICES AT THE CROSSROADS, HOSPITAL-BASED EMERGENCY CARE: AT THE BREAKING POINT,* AND *EMERGENCY CARE FOR CHILDREN: GROWING PAINS*); ENGAGE STAKEHOLDERS IN A DISCUSSION OF THE ISSUES RAISED IN THE REPORTS; AND CONSIDER IMPLEMENTATION ISSUES AT THE NATIONAL, STATE, AND LOCAL LEVELS.

9:00 AM WELCOME AND WORKSHOP INTRODUCTION

Edward B. Clark, University of Utah Health Sciences Center and Primary Children's Medical Center
Nels D. Sanddal, Critical Illness and Trauma Foundation

9:20 OVERVIEW OF THE IOM REPORTS ON THE FUTURE OF EMERGENCY CARE

A. Brent Eastman, ScrippsHealth
Nels D. Sanddal, Critical Illness and Trauma Foundation
Marianne Gausche-Hill, Harbor-UCLA Medical Center

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10:00 BREAK

10:15 PREPAREDNESS FOR PUBLIC HEALTH EMERGENCIES

David N. Sundwall, Utah Department of Health
Admiral John O. Agwunobi, Assistant Secretary for Health, U.S. Department of Health and Human Services

10:45 STATE AND LOCAL RESPONSE PANEL

MODERATOR: **A. Brent Eastman**
Members of the panel will engage in a conversation, led by the moderator, about the IOM reports based on a series of questions set in advance:
(1) What do you think are the key messages of the reports?
(2) Are there any important issues that the reports missed?
(3) What are the top priority areas for action?
(4) What are some of the barriers to implementation?

Jim Antinori, Emergency Physicians' Integrated Care
Joseph Hansen, Critical Illness and Trauma Foundation
Janet Griffith Kastl, Washington State Department of Health Office of EMS and Trauma
Denise King, Emergency Nurses Association
Paul R. Patrick, Utah Emergency Medical Services, Department of Health

11:45 OPEN DISCUSSION

MODERATOR: **A. Brent Eastman**
Attendees are given an opportunity to make a brief comment or ask a question. Members of the IOM committee will respond.

12:30-1:30 PM LUNCHEON PRESENTATION

Brent James, Intermountain Health Care Institute for Health Care Delivery Research
Boxed lunches will be provided.

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1:30 ADVANCING PEDIATRIC EMERGENCY CARE

MODERATOR: **Marianne Gausche-Hill**
10 Minute Presentations Followed by an Open Discussion Session.

Kathleen Brown, Children's National Medical Center
Karen Frush, Duke University Health System
Nathan Kuppermann, University of California, Davis School of Medicine
Jeff E. Schunk, University of Utah School of Medicine and Primary Children's Medical Center

2:45 ADVANCING EMERGENCY CARE IN RURAL AREAS

MODERATOR: **Nels D. Sanddal**
10 Minute Presentations Followed by an Open Discussion Session.

Frederick C. Blum, American College of Emergency Physicians
Richard G. Ellenbogen, University of Washington School of Medicine
Dia Gainor, Idaho Emergency Medical Services Bureau
Chris Tilden, Kansas Department of Health and Environment

4:00 FINAL SUMMATION

Nels D. Sanddal, Critical Illness and Trauma Foundation

SPECIAL OPPORTUNITY:
FOLLOWING THE WORKSHOP, PARTICIPANTS WILL BE ABLE TO VISIT PRIMARY CHILDREN'S MEDICAL CENTER'S PEDIATRIC PATIENT SIMULATOR, WHICH IS ADJACENT TO THE AREA WHERE THE WORKSHOP WILL BE HELD. MORE INFORMATION WILL BE MADE AVAILABLE AT THE WORKSHOP.

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Future of Emergency Care Series

Regional Dissemination Workshop

Northwestern Memorial Hospital
251 E. Huron
Third Floor; Pritzker Auditorium
Chicago, Illinois

October 27, 2006
Workshop Agenda

Objective: To disseminate findings from the three Institute of Medicine (IOM) reports on the future of emergency care (*Emergency Medical Services at the Crossroads, Hospital-Based Emergency Care: At the Breaking Point,* and *Emergency Care for Children: Growing Pains*); engage stakeholders in a discussion of the issues raised in the reports; and consider implementation issues at the national, state and local levels.

8:30 AM Registration

9:00 Welcome and Workshop Introduction

Nels D. Sanddal, Critical Illness and Trauma Foundation
Eric E. Whitaker, Illinois Department of Public Health

9:20 Overview of the IOM Reports on the Future of Emergency Care

A. Brent Eastman, Scripps Memorial Hospital
Brent Asplin, Regions Hospital
Nels D. Sanddal, Critical Illness and Trauma Foundation
Joseph Wright, Children's National Medical Center

10:00 Break

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10:15 STATE AND LOCAL RESPONSE PANEL

MODERATOR: **A. Brent Eastman**
Members of the panel will engage in a conversation, led by the moderator, about the IOM reports based on a series of questions set in advance:
(1) What do you think are the key messages of the reports?
(2) Are there any important issues that the reports missed?
(3) What are the top priority areas for action?
(4) What are some of the barriers to implementation?

Peter Butler, Rush University Medical Center
Thomas Esposito, Loyola University Burn & Shock Trauma Institute
Stephen Hargarten, Medical College of Wisconsin
Bill Jermyn, Missouri Department of Health and Senior Services
Leslee Stein-Spencer, National Association of State EMS Officials

11:15 OPEN DISCUSSION

MODERATOR: **A. Brent Eastman**
Attendees are given an opportunity to make a brief comment or ask a question. Members of the IOM committee will respond.

12:00 PM LUNCHEON PRESENTATION

Cortez Trotter, Chief Emergency Officer, City of Chicago
Boxed lunches will be provided in the atrium.

1:00 THE EMERGENCY CARE WORKFORCE

MODERATOR: **Nels Sanddal**
10 Minute Presentations Followed by an Open Discussion Session.

Bruce Browner, University of Connecticut School of Medicine
Steven E. Krug, Children's Memorial Hospital
Patricia Kunz Howard, University of Kentucky Hospital
Ronald G. Pirrallo, Medical College of Wisconsin

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2:15 HOSPITAL EFFICIENCY (INFORMATION TECHNOLOGY AND PATIENT FLOW)

MODERATOR: **Brent Asplin**
10 Minute Presentations Followed by an Open Discussion Session.

Peter Angood, Joint Commission on Accreditation of Healthcare Organizations
John T. Finnell, Indiana University School of Medicine
Linda Kosnik, Overlook Hospital
Susan Nedza, Centers for Medicare and Medicaid Services

3:30 LESSONS LEARNED FROM TRAUMA SYSTEM DEVELOPMENT

J. Wayne Meredith, Wake Forest University School of Medicine

4:00 CLOSING

Nels D. Sanddal, Critical Illness and Trauma Foundation

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FUTURE OF EMERGENCY CARE SERIES

REGIONAL DISSEMINATION WORKSHOP

TULANE UNIVERSITY SCHOOL OF PUBLIC HEALTH AND TROPICAL MEDICINE
1440 CANAL STREET, TIDEWATER BUILDING
COLLINS C. DIBOLL AUDITORIUM, FIRST FLOOR
NEW ORLEANS, LOUISIANA

November 2, 2006
Revised Workshop Agenda

OBJECTIVE: TO DISSEMINATE FINDINGS FROM THE THREE INSTITUTE OF MEDICINE (IOM) REPORTS ON THE FUTURE OF EMERGENCY CARE (***EMERGENCY MEDICAL SERVICES AT THE CROSSROADS, HOSPITAL-BASED EMERGENCY CARE: AT THE BREAKING POINT,*** AND ***EMERGENCY CARE FOR CHILDREN: GROWING PAINS***); ENGAGE STAKEHOLDERS IN A DISCUSSION OF THE ISSUES RAISED IN THE REPORTS; AND CONSIDER IMPLEMENTATION ISSUES AT THE NATIONAL, STATE AND LOCAL LEVELS.

8:30 AM REGISTRATION

9:00 WELCOME AND WORKSHOP INTRODUCTION

Nels D. Sanddal, Critical Illness and Trauma Foundation
Alan M. Miller, Tulane University Health Sciences Center

9:10 OVERVIEW OF THE IOM REPORTS ON THE FUTURE OF EMERGENCY CARE

A. Brent Eastman, ScrippsHealth
Nels D. Sanddal, Critical Illness and Trauma Foundation
Tommy Loyacono, East Baton Rouge Parish Department of EMS

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9:40 CONGRESSIONAL RESPONSE

U.S. Senator David Vitter
10 Minutes of Remarks Followed by Q & A.

10:00 REGIONAL RESPONSE PANEL

MODERATOR: A. Brent Eastman
Members of the panel will engage in a conversation, led by the moderator, about the IOM reports based on a series of questions set in advance:
(1) What do you think are the key messages of the reports?
(2) Are there any important issues that the reports missed?
(3) What are the top priority areas for action?
(4) What are some of the barriers to implementation?

Bill Brown, National Registry of EMTs
James Moises, Tulane University Health Sciences Center
Sandra Robinson, New Orleans Health Department
Suzanne Stone-Griffith, HCA

11:00 OPEN DISCUSSION

MODERATOR: A. Brent Eastman
Attendees are given an opportunity to make a brief comment or ask a question. Members of the IOM committee will respond.

12:00 PM KEYNOTE ADDRESS

Jeffrey W. Runge, Chief Medical Officer, U.S. Department of Homeland Security

12:30-1:15 LUNCH

Boxed lunches will be provided in the atrium.

1:15 STATE LEVEL PERSPECTIVE

Jimmy Guidry, State Health Officer and Medical Director, Louisiana Department of Health and Hospitals

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1:30 Advancing EMS

MODERATOR: **Ray Bias, Acadian Ambulance Service**
10 Minute Presentations Followed by an Open Discussion Session.

Tom Judge, LifeFlight of Maine
Kurt Krumperman, Rural/Metro
Drexdal Pratt, North Carolina Office of Emergency Medical Services
Arthur H. Yancey II, Fulton County Department of Health & Wellness

2:45 DISASTER PREPAREDNESS

MODERATOR: **Ricardo Martinez, The Schumacher Group**
10 Minute Presentations Followed by an Open Discussion Session.

Albert W. Morris, Jr., National Medical Association
Randy Pilgrim, The Schumacher Group
Paul Sirbaugh, Texas Children's Hospital

4:00 CLOSING

Nels D. Sanddal, Critical Illness and Trauma Foundation

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FUTURE OF EMERGENCY CARE SERIES

CAPSTONE DISSEMINATION WORKSHOP

THE NATIONAL ACADEMIES
2100 C STREET, NW
WASHINGTON, D.C.

AUDITORIUM

December 11, 2006
Agenda

8:30 AM REGISTRATION

9:00 OPENING AND WELCOME

Susanne Stoiber, IOM Executive Director
Nels Sanddal, Critical Illness and Trauma Foundation

9:10 SUMMARY OF DISCUSSIONS AT REGIONAL WORKSHOPS

A. Brent Eastman, ScrippsHealth

9:30 RESPONSE TO IOM REPORTS—FEDERAL AGENCIES

MODERATOR: **Nels Sanddal,** Critical Illness and Trauma Foundation
15-Minute presentations followed by open discussion. Speakers were asked to discuss how their agency/office can assist in promoting the development of a coordinated, regionalized, and accountable emergency care system.

Marilena Amoni, Associate Administrator, National Highway Traffic Safety Administration
Glenn Cannon, Director, Response Division, Federal Emergency Management Agency
Thomas Gustafson, Deputy Director, Centers for Medicare and Medicaid Services

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Jeffrey W. Runge, Chief Medical Officer, Department of Homeland Security
W. Craig Vanderwagen, Assistant Secretary, Office of Public Health Emergency Preparedness

11:00 RESPONSE TO IOM REPORTS—CONGRESSIONAL STAFF

MODERATOR: **Robert Bass,** Maryland Institute for EMS Systems
Brief remarks from panelists followed by open discussion.

Jennifer Bryning, Senate Health, Education, Labor & Pensions (HELP) Committee
Lisa Raimondo, Office of Senator Inouye (D-HI)
Debbie Curtis, Office of Congressman Stark (D-CA)
Billy Wynne, Senate Finance Committee

12:00 PM LUNCH

Boxed lunches will be provided in the Great Hall.

12:45 KEYNOTE ADDRESS

Pete Stark (D-CA), U.S. House of Representatives

1:15 RESPONSE TO IOM REPORTS—CONSUMER AND PURCHASER GROUPS

MODERATOR: **Jane Knapp,** Children's Mercy Hospital
10-Minute presentations followed by open discussion.
Speakers were asked to discuss their reaction to the reports, describe the public/constituents' awareness of problems in the emergency care system, and suggest ways to stimulate public support to address deficiencies in the emergency care system.

Helen Darling, National Business Group on Health
Bruce Lesley, First Focus
Brian Lindberg, Consumer Coalition for Quality Health Care
Joyce Dubow, AARP
Bill Vaughan, Consumers Union

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2:30 CHALLENGES AND OPPORTUNITIES IN EMERGENCY CARE RESEARCH

MODERATOR: **Arthur Kellermann,** Emory University School of Medicine
10-Minute presentations on challenges and opportunities in emergency care research.

William Barsan, University of Michigan Medical School
Nathan Kuppermann, University of California, Davis School of Medicine
Daniel Patterson, University of North Carolina, Chapel Hill

3:00 RESPONSE FROM FEDERAL AGENCIES INVOLVED IN EMERGENCY CARE RESEARCH

MODERATOR: **Arthur Kellermann,** Emory University School of Medicine
10-Minute presentations followed by open discussion.
Speakers were asked to discuss strategies for overcoming barriers and challenges to emergency care research identified in the IOM reports.

Chris DeGraw, Health Resource and Services Administration
Irene Fraser, Agency for Healthcare Research and Quality
Richard Hunt, Centers for Disease Control and Prevention
Chetan Kharod, Uniformed Services University of the Health Sciences
John Marler, National Institutes of Health

4:30 CLOSING

Nels Sanddal, Critical Illness and Trauma Foundation

4:30-5:30 RECEPTION IN THE GREAT HALL

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Appendix B

Workshop Attendees

Salt Lake City Registrants
September 7, 2006

Admiral John O. Agwunobi
U.S. Department of Health and Human Services

John Allen
EmCare Physician Services, Inc.

Ken Allen
EMSC National Resource Center

James Antinori
Emergency Physicians' Integrated Care

Marc Babitz
Utah Department of Health and University of Utah School of Medicine

Mindy Baker
Am. College of Surgeons

Val Bateman
Utah Medical Association

Frederick Blum
WVU School of Medicine

Robert Bolte
University of Utah School of Medicine

Kathleen Brown
Children's National Medical Center

Jan Buttrey
Utah Hospital Association

Ruth Caldwell
American Fork Hospital Emergency Department

Edward Clark
Primary Children's Medical Center

Ronda Clarke
McKay-Dee Hospital

Kathy Colton
Local Trauma Center

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Janet Cortez
University of Utah Hospital & Clinics

Suzanne Day
LDS Hospital

Peter Dayan
PECARN

J. Michael Dean
Intermountain Injury Control Research Center

Nanette Dudley
University of Utah/Primary Children's Medical Center

A. Brent Eastman
ScrippsHealth

Richard Ellenbogen
University of Washington

Michael Ely
Intermountain Injury Control Research Center

Roger Evans
Kootenai Medical Center

Susan Fanelli
California Department of Health Services

Joe Ferrell
Iowa Department of Public Health

Lynnette Fisk
St. Mark's Hospital

Thomas Foley
Chair, Ad Hoc Rural Trauma Committee

Kathryn Friddle
Primary Children's Medical Center

Karen Frush
Duke University Hospital

Dia Gainor
Idaho EMS

Neil Garner
McKay-Dee Hospital

Marianne Gausche-Hill
Harbor-UCLA Medical Center

Erika Geffre
Primary Children's Medical Center

Carrie Grant
Primary Children's Medical Center

Rich Greenberg
University of Utah, Primary Children's

Amy B. Gregory
Critical Illness and Trauma Foundation

Janet Griffith Kastl
Washington State Office of EMS and Trauma Systems

Kristin Gurley
Emergency Medical Services for Children

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Joseph Hansen
Critical Illness and Trauma Foundation

Kris Hansen
Local Trauma Center

Shauna Hatton-Ward
Consumer Representative

Bob Heath
Nevada State EMS

Jerris Hedges
SAEM/Oregon Health and Science University

Mark Holder
Ivinson Memorial Hospital

Scott Horne
UHA

Daryl Huggard
Primary Children's Medical Center

Lisa Hyde
Intermountain Injury Control Research Center

Brent James
Intermountain Healthcare

Bill Jermyn
Missouri Department of Health and Senior Services

Robert Jex
Utah Department of Health

Jerry Johnston
National Association of EMTs

Spencer Jones
University of Utah

Trisha Keller
Violence and Injury Prevention Program

Carolyn Kesler
Primary Children's Medical Center

Joy Khader
Primary Children's Medical Center

Emily Kim
PECARN

Denise King
Parkview Community Hospital

Kathy Kopka
Kopka Associates and Abaris Group

Julie Krueger
Office of Emergency Medical Services

Jennifer Kuo
The Lewin Group

Nathan Kuppermann
UC-Davis School of Medicine

Fergus Laughridge
Nevada EMS and Trauma

Joshua Legler
Utah Department of Health

Tarsis Lopez
Fleishman-Hillard/Emergency Nurses Association

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Denise Love
NAHDO

Tommy Loyacono
NAEMSE

Ron Maio
PECARN

Clay Mann
Intermountain Injury Control Research Center

Angela Marr
Centers for Disease Control and Prevention

Susan McHenry
Office of Emergency Medical Services

Linda McKibben
The Lewin Group

Nancy Mecham
Primary Children's Medical Center

Shalini Mehta
The Lewin Group

Kathleen Merkley
Primary Children's Medical Center

Christine Modena
Banner Health

Michael Moffitt
Gold Cross Services, Inc.

Lyle Moore, Jr.
Colorado Department of Public Health and Environment

Pamela Moore
Intermountain Life Flight

Lee Murdock
Wasatch County Ambulance

Jonell Murray
Primary Children's Medical Center

Douglas Nelson
Primary Children's Medical Center

Launa Nielson
Wasatch County EMS

Lenora Olson
Intermountain Injury Control Research Center

Andy Ostler
Emergency Medical Services for Children

Adele Pagnani
US Army Health Clinic, Dugway Proving Ground

Robert Pagnani
US Army Health Clinic, Dugway Proving Ground

Paul Patrick
Utah Bureau of EMS

Kayleen Paul
McKay-Dee Hospital Center

LeeAnn Phillips
Region II EMS

Gina Pola-Money
Utah Family Voices

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Deborah Pope
Ogden Regional Medical Center

Raymond Price
Intermountain Healthcare

Ramona Randolph
Primary Children's Medical Center

Carolyn Reynolds
Intermountation Healthcare

Helena Rincon
PECARN

Breck Rushton
Logan Regional Hospital

Cindy Sadler
Pioneer Valley Hospital

Nels Sanddal
Critical Illness and Trauma Foundation

Teri L. Sanddal
Critical Illness and Trauma Foundation

Kirk Schmitt
Iowa Department of Public Health

Patricia Schmuhl
Intermountain Injury Control Research Center

Jeff Schunk
Primary Children's Medical Center

Tasmeen Singh
PECARN

Trace Skeen
American Medical Response

Jane Smith
Divsion of Health

Maggie Smith
San Juan Regional Medical Center

Jackie Solon
Primary Children's Medical Center

Joyce Soprano
Primary Children's Medical Center

Heather A. Soucy
Critical Illness and Trauma Foundation

Brenda Staffan
Rural/Metro Corporation

David Sundwall
Utah Department of Health

Donna Thomas
Primary Children's Medical Center

Chris Tilden
Kansas Department of Health and Environment

Becckie Trautman
Primary Children's Medical Center

Tina Turgel
HRSA/EMSC

Amanda Valenzuela
Bureau of EMS

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Heather Van Duker
Intermountain Injury Control Research Center

Jolene Whitney
Utah Bureau of Emergency Medical Services

Angela Wickham
Health Preparedness Program

Lucinda Wilmshrust
LDS Hospital

Martin Wilson
Emery County Ambulance

Marty Wilson
Carbon County Ambulance

Richard Wilson
South Davis Community Hospital

Steve Wilstead
Delta Community Medical Center

Harry “Tripp” Wingate
EmCare—EPS Division

Deanna Wolfe
Ogden Regional Medical Center

Don Wood
Utah Department of Health

Debra Wynkoop
UHA, Utah Hospitals & Health Systems Assn.

Debbie Young
DRMC

Sally Jo Zuspan
Intermountain Injury Control Research Center

Chicago, Illinois
October 27, 2006

Joyce Adelberg
Manager, Northwestern Memorial Hospital

Carl Adrianopoli
U.S. Department of Homeland Security

Crystal Allen
McKesson Corp

Todd L. Allen
LDS Hospital

Sameera Ali
American College Surgeons

Scott Altman
Northwestern University

Linda Angarol
Southern Illinois Healthcare

Peter Angood
Joint Commission on Accreditation of Healthcare Organizations

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Brent Asplin
Regions Hospital

Cindy Aten
Methodist Medical Center of Illinois

James Augustine
EMP

Jeff Bates
Texas Medical Association

Hunt Batjer
Northwestern University Feinberg School of Medicine

Christopher Beach
Northwestern Memorial Hospital

Pamela Block
Emergency Nurses Association

Frederick Blum
ACEP

Bruce Browner
University of Connecticut School of Medicine

Karin Buchanan
St Alexius Medical Center

Brad Bunney
ICEP

Bundi Burke
NMH EMS Staff Educator

Peter Butler
Rush University Medical Center

Christine Chaput
Loyola University Medical Center

Carey Chisholm
Society for Academic Medicine

Mark Cichon
Loyola University Medical Center

Jamie Collings
Northwestern

Patrick Connor
Northwestern University

Brian Cote
Ottawa Medical Control Board Authority

Mark Courtney
Northwestern University

David Culp
Division of Disaster Planning and Readiness, Illinois Department of Public Health

Shaunessye Curry
GAO

Joy Davis
Northwestern Memorial Hospital

James DiGiorgio
Team Health

Kim Dixon
Reuters

Cathie Donahue
Sherman Hospital

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Amy Durtschi
Abbott Point-of-Care

A. Brent Eastman
ScrippsHealth

Jim Enders
Centers for Disease Control and Prevention

Thomas Esposito
Loyola University Burn & Shock Trauma Institute

Larry Faines
NMH

Richard Feldman
Advocate Illinois Masonic Medical Center

John Finnell
Indiana University

Thomas Fisher
University of Chicago

Sam Gaines
Illinois Dept. of Public Health

Andrea Genovesi
University of Utah

Keesha Gibbs
Lake Forest Hospital

Al Gooding
Gladys Tracy Halstead Foundation

Rick Gower
EMS

Cathy Grossi
IL Hospital Association

Kendall Hall
Northwestern University

Michael Hansen
Illinois Fire Chiefs Association

Stephen Hargarten
Medical College of Wisconsin

Dan Hermes
Illinois/International Fire Chiefs

Elizabeth Holst
St Alexius Medical Center

Shirin Hormozi
U.S. Government Accountability Office

Russ Horowitz
Children's Memorial Hospital

Edwin Huellstrounk
Delnor Community College

Kathryn Janies
Illinois EMSC

Bill Jermyn
Missouri Department of Health and Senior Services

Jerry Johnston
National Association of EMTs

Nancy Jorgensen
Healthy Community Access Project (HCAP)

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Nick Jouriles
American College of Emergency Physicians

Daniel Kavanaugh
Federal EMSC Program

Rahul Khare
Northwestern Memorial Hospital

Meredith Klein
ENA

Linda Kosnik
Overlook Hospital

Steven Krug
Children's Memorial Hospital

Patricia Kunz Howard
University of Kentucky Hospital

Jennifer Kuo
The Lewin Group, Inc.

Thelma Kuska
National Highway Traffic Safety Administration

Demetrios Kyriacou
Northwestern University

Raj Lal
Westlake Hospital

Moses Lee
Community Care

Melinar Ligon
Christian Hospital

Patricia Lindeman
Northwestern Memorial Hospital

Debra Livingston
Northwestern University

Barbara Lowery
Amer Association Oral & Maxillofacial Surg

Brian Lucid
Xigma Engineering Services

Evelyn Lyons
Illinois Department of Public Health

Jim Lyznicki
American Medical Association

Brian Macaulay
University of Illinois at Chicago

Mack Mackey

Kate McDonough
Illinois College of Emergency Physicians

Megan McHugh
Institute of Medicine

Linda McKibben
The Lewin Group

Bruce McNulty
Swedish Covenant Hospital

J. Wayne Meredith
Wake Forest University School of Medicine

Cheryl Miles
Illinois Dept. of Public Health

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Amy Misener
SIH

Annie Moy
Northwestern Memorial Hospital

Jean Mullally
Louis Stokes Cleveland VA Medical Center

Ann Murray
NMH

Mark Mycyk
Northwestern University, Feinberg School of Medicine

Toby Myers
Galesburg Hospitals Ambulance Service

Melanie Neal
American College of Surgeons

Susan Nedza
Centers for Medicare and Medicaid Services

Janet Odom
DHS

Lenora Olson
University of Utah

Mary Otting
Children's Memorial Hospital

Peter Pang
Northwestern Memorial Hospital

Beth Passarelli
Alexian Brothers Medical Center

Francis Peed
Peach Regional Medical Center

Bart Phillips
American College Surgeons

Ronald Pirrallo
Medical College of Wisconsin

Margie Porcella
Transcription Professionals

Cynthia Pribble
Southern Illinois Healthcare

Leslie Reed
Missouri Foundation for Health

Sally Reynolds
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Appendix C

Acronyms

AAP	American Academy of Pediatrics
ACEP	American College of Emergency Physicians
ACTION	Accelerating Change and Transformation in Organizations and Networks
AHRQ	Agency for Healthcare Research and Quality
ANCC	Advice nurse call center
CDC	Centers for Disease Control and Prevention
CEN	Certified emergency nurse
CMS	Centers for Medicare and Medicaid Services
DHHS	U.S. Department of Health and Human Services
DHS	U.S. Department of Homeland Security
DMAT	Disaster management assistant team
DoD	U.S. Department of Defense
DOT	U.S. Department of Transportation
ED	Emergency department
EDAP	Emergency department approved for pediatrics
EMAC	Emergency Management Assistance Compact
EMRA	Emergency Medicine Residents' Association
EMS	Emergency medical services
EMS-C	The federal Emergency Medical Services for Children program

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EMT	Emergency medical technician
EMTALA	Emergency Medical Treatment and Active Labor Act
ENA	Emergency Nurses Association
FDA	U.S. Food and Drug Administration
FEMA	Federal Emergency Management Agency
FICEMS	Federal Interagency Committee on EMS
HCUP	Healthcare Cost and Utilization Project
HRSA	Health Resources and Services Administration
INPC	Indiana Network for Patient Care
IRB	Institutional review board
JCAHO	Joint Commission on Accreditation of Healthcare Organizations
LERN	Louisiana Emergency Response Network
LVN	Licensed vocational nurse
MCHB	Maternal and Child Health Bureau
MRC	Medical Reserve Corps
NEMSIS	National EMS information system
NETT	Neurological Emergencies Treatment Trials
NHTSA	National Highway Traffic Safety Administration
NIH	National Institutes of Health
NINDS	National Institute of Neurological Disorders and Stroke
PALS	Pediatric advance life support
PCCC	Pediatric critical care center
PECARN	Pediatric Emergency Care Applied Research
PHESS	Public Health Emergency Surveillance System
PICU	Pediatric intensive care unit
PSO	Patient safety organization
SAEM	Society for Academic Emergency Medicine
SPOTRIAS	Special Program of Translational Research in Acute Stroke
USU	Uniformed Services University of the Health Sciences

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