Regionalization of Emergency Care Future Directions and Research: Workforce Issues

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Abstract

The provision of emergency care in the United States, regionalized or not, depends on an adequate workforce. Adequate must be defined both qualitatively and quantitatively. There is currently a shortage of emergency care providers, one that will exist for the foreseeable future. This article discusses what is known about the current emergency medicine (EM) and non-EM workforce, future trends, and research opportunities.

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A well-trained, efficiently distributed workforce is critical to provide for the nations' emergency care needs. This includes any regionalized system of emergency care. The cognitive and technical skills of emergency care providers are vital resources in ensuring delivery of timely, high-quality emergency care to all Americans. Currently, 120 million patients go to our nation's emergency departments (EDs) each year. Historic trends have shown that the demand for emergency care continues to rise,[1] even with health care reform and a push toward universal insurance coverage.[2] This reflects a growing, aging population with many chronic diseases. This rising demand is likely to increase the need for emergency care providers. There is currently a shortage and mal-distribution of emergency medicine (EM) residency-trained and board-certified physicians (emergency physicians [EPs]).[3–7]

The 2010 *Academic Emergency Medicine* consensus conference on regionalization of emergency care focused on getting the right care to the right patient at the right time. We describe the current state of the emergency care workforce, potential solutions, and a vision for the future. Our discussion looks at EPs, non–EM-trained physician providers, and nonphysician providers. We identify gaps in knowledge that form the basis of an emergency care workforce research agenda. Our discussion focuses on the goal of improved access to high-quality emergency care for all acutely ill or injured patients across the entire United States. Under any regionalization plan, an efficiently distributed, qualified workforce will ensure a sufficient number of providers with appropriate training for their practice environments and will be distributed according to patient need throughout the system.

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THE EP WORKFORCE

Current State of Knowledge

Several recent studies of the physician workforce have confirmed that there are not enough EPs to cover our nation's EDs. The 2007 American College of Emergency Physicians (ACEP) Workforce Study found that 65% of the estimated 42,100 practicing physicians in EDs were American Board of Emergency Medicine (ABEM) or American Osteopathic Board of Emergency Medicine (AOBEM) certified.[3] Similarly, in an analysis of the 2008 American Medical Association Physician Masterfile, 69% of the 39,061 clinically active physicians working in EDs were EM residency trained or EM board certified.[4] Further, this EP shortage will likely persist for at least several decades, given current EP productivity, the limited number of EM residency training slots, and the loss of emergency care providers through attrition from active practice.[5]

The 2006 Institute of Medicine (IOM) report on hospital-based emergency care recognized that: ''Although ideally all EDs would be staffed by residency-trained, board-certified emergency physicians, this is highly unlikely to occur in the near to mid-term, if ever. Therefore, alternative staffing models must be developed.''[6] Largely in response to the IOM report, representatives of all major EM organizations accepted an invitation from ACEP and met in July 2009 to discuss the future of EM, with a major emphasis on workforce. After reviewing the literature, there was broad consensus that an insufficient EP workforce represents a potential threat to patient safety and that it is likely that EM board certified EPs will not be able to completely fill the workforce demand for several decades, if ever.[7] The report emphasized the importance of timely access to adequately trained emergency care providers as an important public health goal.

Potential Solutions

Potential solutions to increasing the total number of clinically active EPs are aimed at increasing the supply of physicians, while decreasing the attrition. As of 2009, there were 149 allopathic and 43 osteopathic EM residency programs with approximately 1,500 graduates per year.[7] Given that nearly all existing EM residency slots are filled, one potential solution to increase the supply of EPs would be to increase the number of EM residency positions. This can be accomplished by either increasing the number of programs or increasing the number of residents per program. This would require an increase in Graduate Medical Education funding. With shortages in most medical specialties, it is unlikely that EM will be given more training slots unless the entire pool is increased for all specialties.

Emergency medicine as a specialty has high physical and emotional demands leading to legitimate concerns about attrition from active EM clinical practice. A recent report estimated the overall annual attrition rate from EM clinical practice at 1.7%,[8] which was lower than the average 2% to 3% rate for all physicians.[9] While leaving EM clinical practice for another specialty or nonclinical activities and early retirement should be monitored, it appears that attrition is not a primary reason for the workforce shortage.

Increasing physician efficiency, in terms of patients per hour and overall number of clinical work hours, would help to alleviate the current shortage of EPs. A common assumption is that a minimum of approximately four to five full-time equivalent (FTE) physicians is needed for each ED: 168 hours per week divided by 40 hours per week per physician, rounding up to account for nonclinical and vacation time and the fact that patients in the ED have emergent conditions, are new to the practice, arrive unscheduled, and have high acuity including life-threatening conditions that must be treated in a time-limited fashion. There are two distinct paths to increase efficiency: 1) for larger volume EDs that can support >5 FTEs, exploring methods to improve patients per hour; and 2) for smaller volume EDs that are limited by person-hours of coverage time rather than volume, exploring alternate models for fewer FTEs.

Physicians working in EDs on average spend one-third of their work hours on administrative activities.[10] Increasing the proportion of time spent on patient care would improve efficiency. Electronic medical record systems, initially thought to improve efficiency, have largely increased the administrative burden of physicians.[11] The increasing burden of regulation has decreased physician productivity by requiring more documentation and administrative work to accomplish the same patient care task.[10] Time is spent fixing the paperwork and not the patient. The same argument could be made for the constant threat of litigation. Tests and procedures are added to protect against a potential lawsuit, which decreases physician productivity. Preliminary retrospective studies of scribes, or staff who shadow physicians and help with the clerical aspects of patient care, have been associated with increased productivity, patients per hour, and patient flow.[12] Another potential solution to improve physician efficiency is to increase utilization of physician assistants (PAs) and nurse practitioners (NPs). Indeed, these providers are now involved in the care of 13% of all U.S. ED visits.[13] Under direct physician supervision, PAs and NPs can increase the patients per hour of physicians, and studies show that patients are satisfied with PA and NP care for lower-acuity presentations.[14–16] Because there are a very limited number of PAs and NPs with specialty training in emergency care, the effect of such training is not yet known.

In lower-volume EDs where person-hours of coverage rather than efficiency is the determinant of FTE needs, increased clinical work hours or off-site supervision of non–EM-trained providers by EPs could be explored.[7] Emerging technologies may help extend the EM workforce. For example, telemedicine may be used to connect patients and local providers with EPs and other specialists.[17] Alternative schedules, such as 24-hour shifts, have been implemented in lower-volume EDs, but the extent of this practice and acceptability to physicians is unknown. Additionally, the feasibility and effects of ensuring at least one EP in every ED has not been explored, but aligns with the concept of regionalization.

Research Questions

- What are the prevalence and effects of physician attrition to non-EM clinical practice, including urgent care?
- What is the feasibility of fewer physician FTEs for 24/7 coverage of lower-volume EDs (e.g., would physicians tolerate longer hours when patient volume is lower)?
- What are the feasibility and effects of at least one EP in every ED?
- How does placement of EPs in smaller, rural EDs affect the overall quality of emergency care in that ED?
- How would an EP as ED medical director affect quality of emergency care? Is this changed if the director also works clinically?
- What is the effect of physician-supervised PAs and NPs on quality, cost, and value of ED care?
- In a prospective and ideally experimental design, what is the effect of scribes on physician efficiency?
- What are novel and effective solutions to improve physician efficiency?
- What is the effect of electronic medical record systems on ED efficiency?

TRAINING AND SKILLS

Current State of Knowledge

We fully support EM residency training and agree with the consensus of the ''Future of EM'' summit that EPs are the criterion standard providers of ED care.[7] However, due largely to the workforce shortage, more than 12,000 non–emergency-trained physicians provide care for ED patients across the country today.[4] The majority of these providers are primary care trained (family medicine, internal medicine, pediatrics), but physicians with other specialty training—or no training—also staff our nation's EDs. There are limited data on the skills, training, and patient outcomes of this diverse group. A single-center study reported that the introduction of an EM residency program in 1989 improved the proxy measures of chart documentation and decreased test ordering.[18] Other studies suggested that the presence of EM faculty and residents improved success of intubation, although airway protocols were simultaneously developed.[19,20] Another study looked at closed malpractice claims from a single insurer and revealed that the cost per physician-year of malpractice coverage for EPs was half that of non–residency-trained physicians staffing EDs.[21] However, these studies are older, single-institution studies with pre/post designs that were subject to confounding by case mix and other environmental influences. Further comparative studies about the ED care provided by EPs and non-EP providers, in both urban and rural settings, will help clarify capabilities and limitations by provider type.

In addition to non-EPs, the number of PAs and NPs practicing without onsite physician supervision has increased. These providers usually do not have formal, accredited EM training. Five percent of U.S. ED visits in 2005 were seen by a PA or NP without direct physician supervision, up from 1% in 1993.[13] While PAs and NPs may fill a workforce gap at a lower cost to hospitals than physicians, the quality of patient care should also be considered. One recent study found that PAs and NPs practicing without direct supervision provided lower-quality care for acute asthma than when supervised directly by physicians or when compared to physicians working alone.[22]

Potential Solutions

Non–EM-trained providers, both physicians and nonphysicians, will likely provide patient care in EDs for the foreseeable future. Both the IOM and ''Future of EM'' reports recognized this.[6,7] EM residency training will remain the criterion standard for providers of emergency care, especially when linked to board certification, which requires ongoing activities to maintain certification. Defining the cognitive and procedural needs of emergency care and providing education outreach could help to improve the quality of ED care for other providers, although doing so would not replace EM residency training.

While the EM Residency Review Committee and board certification entities broadly define the competencies for EPs, there is no such definition for providers who are not EPs. One key area for improvement would be to define conditions and procedures that are most likely to improve patient outcomes and focus on these for educational outreach. These identified minimally necessary knowledge and skills should encompass time-sensitive capabilities that are likely to affect acute patient outcomes. Our consensus conference has defined several potential emergency care, time-sensitive conditions, including trauma, cardiac arrest, ST-elevation myocardial infarction, stroke, sepsis/critical care, and toxicology. The minimum critical procedural skills should also be defined for any clinician who will be staffing EDs. Also of importance would be to define conditions and associated procedures that are potentially less sensitive to EM training or less critical for all autonomous ED providers. We clearly realize that this approach is fraught with danger for the patient because triage acuity and presenting complaints are estimates, and minor and straightforward presentations are often more serious than initially thought.[23]

With limited time and resources, these definitions will help focus education efforts on areas of highest yield. Many non-EPs would benefit from additional continuing medical education, geared toward specific areas of emergency care.[24,25] Programs such as Comprehensive Advanced Life Support (CALS) teach critical information and skills for emergency care providers.[26] While limited time emergency care fellowships would not—and should not—lead to EM board certification, they could enhance the skills and experience of primary care trained providers who are currently providing emergency care. Such programs may help improve emergency care in a global sense, especially if proposed ED categorization systems clearly and publicly identify provider training and facility capabilities.

Several emergency care training programs exist for PAs and NPs. These are typically 12–18 months in length. Further development of these postgraduate

training programs and progression toward standardized curricula, program accreditation, and certification of graduates may help.

In a system of regionalized emergency care, providers in smaller and rural EDs may require a different level of content expertise and scope of practice than those in urban, tertiary care centers. In this light, we should also evaluate EM residency training, which is primarily based in urban, tertiary care centers, to ensure that graduates have the necessary skills and knowledge to practice in rural, remote settings with limited resources, limited subspecialty back-up, and a potentially different patient mix. An important issue for smaller and rural EDs, especially in the era of regionalization, is who, when, and how to transfer patients to larger centers. Because residency training typically occurs in those larger referral EDs, hands-on training and experience through rotations in smaller, referring EDs would be one potential solution.

Although some states require close physician supervision of new PA and NP graduates, not all do. No state requires supervision of physicians. For most nonphysician providers and non-EPs, learning occurs through on-the-job experience. There is no guarantee that such a practice will lead to the provider becoming proficient in the EM core competencies. Self-learning of EM may place the patient being treated at high risk while the provider is gaining experience. The patient may not even be aware of the qualifications of his or her provider. This issue requires further evaluation.

Overall, the goal is not to replace EPs, a temptation that might arise from the generally lower wages of non–EM-trained providers. The goal is to provide patient access to a competent provider in areas where EPs are not available. An underrecognized fact is that 86% of patients seen by PAs or NPs without direct physician supervision do so in urban EDs.[13] In this setting, where access to EPs should be much easier to achieve, hospital and ED administrators may be driven by practical and financial considerations to hire less expensive providers instead of EPs. Motivations for hiring non–EM-trained providers should be evaluated to ensure that the focus is on patient safety and providing patient access to high quality emergency care, not merely cost savings.

Research Questions

- What are the minimum expectations of patients presenting for emergency care to any U.S. ED?
- What are the differences in the quality of ED care between EPs and non-EP providers?
- What are the cognitive and procedural training needs of non-EM trained providers?
- How well do ED patients accept non–EM-trained physicians? PAs? NPs?
- What conditions among ED patients are sensitive to specialized emergency care training that could be targeted by educational outreach programs for non-EM trained providers that would demonstrate improved patient outcomes?
- What conditions among ED patients are less sensitive to EM training and thus may not yield outcome differences between provider types?
- How well are EM residents trained to provide emergency care in smaller and more remote EDs (i.e., with limited back-up)?
- What is the effect on knowledge and patient outcomes of targeted programs for emergency care providers (e.g., CALS)?
- What is the effect on knowledge and patient outcomes of postgraduate EM training programs for PAs and NPs?
- What is the motivation for hiring non-EM trained providers to provide emergency care?
- What is the motivation of non-EM trained providers to practice in EDs?
- How effective is simulation-based education for evaluating and training the cognitive and procedural needs of all emergency care providers, both EM and non–EM trained?
- How do non-EP providers affect the workforce needs of their native specialties?

GEOGRAPHIC DISTRIBUTION

Current State of Knowledge

The geographic mal-distribution of EPs is one of the most challenging aspects facing the EM workforce. This is true for all medical specialties. Fewer physicians staffing EDs are located in rural areas.[27] This is particularly true for EPs. National data from 2008 show that there were 10.3 EPs per 100,000 population in urban areas versus 5.3 in large rural areas and 2.3 for small rural areas.[4] There is also a geographic disparity among all physicians staffing EDs with 14.5 physicians per 100,000 population in urban areas versus 10.4 in large rural areas and 10.1 in small rural areas. Even more concerning is that rural physicians tend to be older. Rural physicians working in EDs are more likely to retire than they are to be replaced by new EPs (Figure 1), who as a group favor practicing in urban areas.[4] Thus, once there are an adequate number of EPs to staff all of the nation's EDs, there will still be an issue of distribution. Recruitment and retention of any physicians, and ideally EPs, to rural areas is a high priority.

There are several factors involved in the ability to hire EM residency graduates in rural areas. First, there needs to be interest generated among EPs to staff rural EDs. Second, and probably of equal importance, there need to be means to support EP salaries in low-volume, rural EDs. With one-third of U.S. EDs having a visit volume that averages less than one patient per hour (<8,760 annual visit volume),[28] this is not a trivial problem. If physicians are unable to generate sufficient revenue for the hospital, their costs become more difficult to justify (even with a higher level of qualifications compared to non–EM-trained providers). Third, this small volume may not allow EPs to maintain their specialty skill set. For small hospitals, it may be useful to hire physicians who can provide competent care in multiple units—i.e., not only in the ED but also in the intensive care unit (ICU), wards, and outpatient clinics.

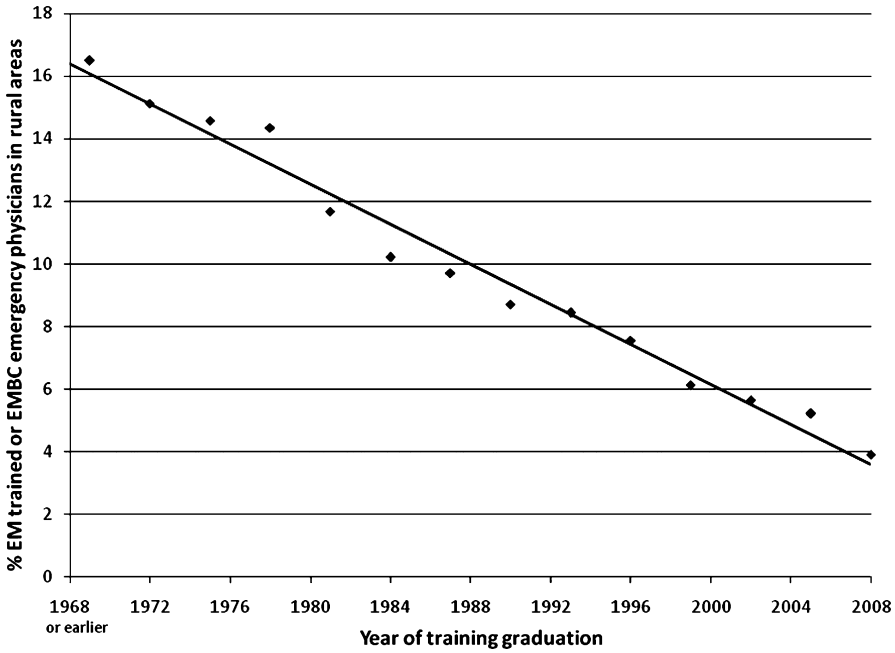

Figure 1. Proportion of EM-trained or EM board-certified (EMBC) physicians currently practicing in rural EDs by time since training graduation. Adapted from Ginde AA, Sullivan AF, Camargo CA Jr. National study of the emergency physician workforce, 2008. Ann Emerg Med. 2009; 54:349–59. With permission from the American College of Emergency Physicians.

Potential Solutions

Similar problems face EM and other specialties in recruitment and retention to rural areas. The solutions for EM parallel those of other specialties.[29] From the recruitment perspective, increasing EM resident exposure to rural EDs, either through required or through elective rotations, may create greater interest in rural practice.[30] Given that rural upbringing or family ties draws physicians back to rural environments,[31,32] targeted recruitment of these medical students to EM residency programs may increase the number of EPs who choose to work in rural EDs. Some medical schools have developed rural tracks. These students could also be targeted for recruitment to EM residency programs. Currently, few state or federal loan repayment programs for practice in rural and other underserved communities include EM as an eligible specialty. Increasing access to these programs will help recruit and retain EPs to rural EDs. Currently, international medical graduates completing residency in the United States must return to their home country for 2 years before applying for a permanent U.S. visa. However, the J1 visa waiver program, designed to recruit international medical graduates to rural and other underserved areas, waives this requirement. Applying this program to the 4% of EM trainees who are international medical graduates may enhance recruitment to rural EDs.

From the hospital perspective, solutions are needed for smaller, rural hospitals to generate revenue to support competitive EP salaries. Critical Access Hospital status increases Medicare reimbursement and allows for resources to support providers who would otherwise be difficult to support. Another way to increase value for lower volume EDs is to increase the revenue-producing activities of EPs, such as increasing the value and reimbursement for emergency care. Development and enhancement of joint EM–primary care training programs (e.g., EM–internal medicine, EM–family medicine, and EM–pediatrics), or otherwise enhancing the inpatient skills of EM residency graduates, would increase the flexibility and opportunities of EPs in rural facilities. Another potential solution is to develop a sharing program where EPs in urban areas provide some coverage or supervision in rural EDs through collaborative agreements.

Finally, because 24/7 coverage of all EDs with EPs appears unachievable for the foreseeable future, rational utilization of this limited resource is important. Categorization and regionalization of EDs may be a method to distribute EPs. This would also increase the public's knowledge of specific ED capabilities and the qualifications of the emergency care provider. One potential drawback of a regionalized system would be recruiting EPs to EDs where the sicker patients have been regionalized away. It is difficult for an EP to maintain specialty specific skills and expertise in a low-volume, low-acuity environment. This is particularly important for EPs in critical access and other more remote hospitals where the need for expertise in disaster planning and surge capacity are issues vital to our public health and our national security.

Research Questions

- What are the motivations of EM residency graduates who choose rural or urban practice locations and which of these are or are not amenable to intervention?
- What is the effect of interventions (increased rural rotations, loan repayment opportunities, J1 visa

waiver program) on recruitment and retention of EPs to rural areas?
- What are the feasibility and training needed to expand EP roles in smaller, rural hospitals to the ICU, ward, or clinic setting?
- What is the effect of primary care trained providers staffing EDs on the rural primary care workforce?
- Are there novel, sustainable ways to financially support EPs in rural EDs?
- How do we efficiently distribute EPs in a regionalized, categorized system of emergency care?
- What is the effect of regionalization on the ability to recruit new EPs to rural EDs? What is their ability to maintain skills and expertise?

NON-EM WORKFORCE

The 2006 IOM report ''Hospital-based Emergency Care: At the Breaking Point'' reported that physician non-EM specialists are often unavailable to provide emergency and trauma care.[6] The ability to consult a non-EM specialist is critical to the quality of care provided in our EDs. Federal law further requires that if a hospital can provide specialist care to its inpatients, it must also provide access to specialist care for its ED.

The 2003 update of the Emergency Medical Treatment and Active Labor Act (EMTALA) marked a distinct change in the way that hospitals are required to provide on-call coverage. Prior to 2003, common practice patterns upheld an informal rule that hospitals had to ensure 24-hour on-call coverage for specialties that had three or more physicians practicing at the institution. According to the 2003 update, 24-hour coverage is not required for underrepresented specialties for which such provisions are deemed unfeasible. The change to the regulations has allowed hospitals greater flexibility in deciding if and when they provide on-call coverage.[33] The new rules state that there would be no minimum requirement for frequency of on-call coverage and that it would be up to each hospital to adopt its own coverage standards. This also allowed for non-EM specialists to have simultaneous on-call duties at multiple institutions and to schedule elective procedures and surgeries while on-call.[34]

After this 2003 update, the root problem for the nation's emergency care system has been getting non-EM specialists to take call. By 2004, two-thirds of ED medical directors reported an inadequacy of on-call coverage.[35,36] In the years prior to 2003, emergency call was considered a responsibility of all physicians. Traditionally, on-call coverage was accepted as a requirement for having hospital medical staff privileges. This professional norm has changed for several reasons. Anecdotal reports suggest that all emergency care providers, EP or on-call, often do not get paid for emergency care due to the high numbers of under- or uninsured patients, which account for more than 16% of ED visits.[37] Factors such as the lack of an established relationship between the physician and patient, the higher acuity, and the chance for a bad outcome mean that all emergency care providers are subject to higher liability.[6,37] These issues are further compounded by the current emphasis young physicians place on work-life balance. Duty hour limitations learned while in training continue after. The newer generation of physicians often believes that on-call demands are disruptive to family life and private practice.[6]

The 2006 IOM report indicated that almost three-quarters of hospitals nationally report a shortage of physicians willing to take call.[6] Hospitals are required by EMTALA to develop protocols for meeting the needs of patients who require non-EM specialists when none are on-call.[38] Hospitals now offer stipend payments to entice physicians to take call. Hospitals that cannot afford stipends are forced to do without call coverage and to transfer ED patients for whom they cannot provide care. ED patients, particularly in smaller and rural hospitals, are waiting longer for non-EM specialist care and are often forced to be transferred significant distances for care.[37] Quality of care and patient outcomes are also negatively affected by this shortage of non-EM specialists on-call. Twenty-one percent of patient deaths or permanent injury can be attributed to ED delays in treatment linked to shortages of on-call specialist physicians.[39]

Although much of the focus on non-EM specialist physician shortages is directed toward surgical and trauma specialists (who address time-sensitive emergency issues), deficiencies in on-call coverage can certainly extend to nonsurgical specialists who provide time-sensitive care, such as cardiologists and neurologists. Little is known regarding the shortages of nonsurgical specialty care, and this remains an aspect of the current emergency care system that needs further study.

Current State of Knowledge

Prior studies have shown that hospitals are increasingly losing their ability to provide on-call coverage and have examined which specialties represent the greatest unmet need for coverage.[34–36,40,41] These studies were done before new hospital strategies for providing coverage were implemented. They did not evaluate how the lack of coverage has affected the ED's ability to provide emergency care. Research opportunities include potential future solutions to improving on-call care, as well as identifying the roadblocks to change that exist within the current system.

Three studies have examined on-call shortages at the state level. The first study was a cross-sectional survey of CEOs from all hospitals with EDs in Oregon ($n = 56$).[34] The survey asked about stipends for on-call non-EM specialists and examined changes in the hospitals' trauma designation, as well as their ability to provide continuous coverage for certain specialties. Forty-three percent of hospitals paid a stipend, and 31% guaranteed pay for treating uninsured patients while on call. Thirteen percent of hospitals had their trauma designation affected due to on-call coverage problems, and 48% lost their ability to provide continuous coverage for at least one specialty. In the follow-up study, hospitals surveyed in 2005 and again in 2006 showed an increase in annual stipend of 84% between the 2 years. The average total cost of maintaining call coverage for hospitals with more than 100 beds in Oregon in 2006 was $1.8 million.[41]

The practice of paying stipends plus a guaranteed rate of pay for uninsured patients occurred in the majority of urban hospitals and hospitals with more than 100 beds in 2006. The same study indicated that orthopedics represented the specialty with the most frequent difficulty in maintaining call coverage, with 65% of hospitals reporting at least some difficulty.

The second state-level study surveyed all members of the California chapter of the ACEP (n = 1,876). It asked for patient, physician, and ED demographics; specialist availability; insurance profile; and the availability of follow-up care.[40] Thirty-two percent of the survey participants responded, representing about 90% of the EDs in California. The greatest troubles reported were with plastic surgery, ear/nose/throat, dentistry, psychiatry, neurosurgery, ophthalmology, and orthopedics. Seventy-two percent reported rules requiring staff to take ED call. On-call problems were worst at night and on weekends. Lack of patient insurance affected the willingness of almost 70% of physicians to take patients, and almost all respondents reported some trouble getting follow-up. According to this study, in 2006 California hospitals paid 35% of their medical specialties to take call.

The third study surveyed access to on-call hand surgeons in three major cities known to have a significant number of qualified hand surgeons in the area.[42] It found that 8 of 13 hospitals contacted stated either they had no access to any hand surgeon or they did not have access to an on-call hand surgeon every day. The reasons for this shortage were multifold. Many of the hand surgeons in the area chose not to take call for the local hospitals. Other hand surgeons actively chose to work exclusively in outpatient surgery centers to avoid ED call. EDs that reported having either no hand coverage or partial hand coverage were forced to call other facilities in the region to try to locate a surgeon who would accept the patient. The burden of calling other facilities, which typically is the responsibility of the EP, can decrease productivity and limit the EP's ability to care for other critically ill patients. The burden of having to make multiple phone calls to find an accepting physician can be cumbersome and contribute to delays in care. When these patients are uninsured, finding an accepting physician is even more challenging. Concern over liability has led many physicians to decrease their exposure to high-risk cases by no longer taking call.[43]

The first national-level studies of this issue were done by ACEP in 2004[35] and reattempted in 2006.[36] The cross-sectional 2004 study showed that 29% of ED directors reported an unmet need for neurosurgery coverage, 26% for hand surgery, and 21% for orthopedic surgery. Regression analysis revealed a significant relationship between the proportion of safety net patients in the ED and the unmet need for coverage. The follow-up 2006 study surveyed those who responded to the initial survey with results that were not nationally representative.

NURSING WORKFORCE

In addition to the shortage of physicians in the United States, there is also a shortage of nurses. This nursing shortage directly affects the ED and contributes to overcrowding. A national survey of nurses found that 70% reported the shortage had delayed nurses' responses to pages and telephone calls, interrupted staff communications, increased the number of complaints about nursing care, reduced the number of available hospital beds, increased patient wait times for surgery and tests, and delayed patient discharges.[44] Another survey of nurses and chief nursing operators reported that the majority of both groups believed that time for collaboration, teamwork, and early detection of patient complications; the ability of nurses to maintain patient safety; and the amount of time they had to spend with patients were negatively affected by the nursing shortage.[45] Fixing the nursing shortage will require increasing the number of nursing education programs, increasing nursing faculty, increasing the number of new nurses, retaining nurses, increasing racial and ethnic diversity, and working with researchers to shed light on the many factors that affect the problem.[46] Many of the patient care delays related to the shortage of both ED nurses and nurses in the rest of the hospital contribute to ED overcrowding. These should be researched and addressed. Research that specifically looks at ED nursing shortages and its effects on care is needed.

Issue: Are On-call Coverage Shortages Affecting Quality of Care?

The study conducted on Oregon hospitals indicated that in 2006, two-thirds of hospitals had lost the ability to provide 24/7 coverage for at least one specialty. This loss of coverage was especially pronounced in urban and large hospitals. About 49% of hospitals managed the lack of on-call coverage by transferring patients to other hospitals on a case-by-case, ad-hoc basis.[41] The quality of care given to other patients in the ED may be less if an EP is tied up making multiple phone calls in an attempt to transfer a patient due to lack of on-call coverage.

The quality of ED patient care is potentially affected by an increased number of transferred patients that go through the ED before being admitted. This may reflect a hardship for the patient and the family. Arranging a transfer is time-consuming, and hours of delay can accrue before the patient actually arrives at the receiving facility. Transferring a patient often requires an ambulance or helicopter service to provide transport, and this is a costly endeavor that also adds risk. When patients are transferred out of areas that have qualified physicians who are capable, but are refusing to provide on-call care, this could affect the overall quality of health care in that community. It also could cause significant strain for the patient's family, who may have to travel far distances to reach the receiving hospital. The burden is often placed on larger tertiary care and trauma centers to care for both routine and complex cases. With many hospitals anecdotally downgrading their trauma designation due to lack of on-call specialists, this could place a large clinical and fiscal responsibility on the hospitals that do provide on-call care. It may also contribute to hospital overcrowding at those facilities.

Academic centers that have on-call specialists providing care are thought to be seeing an increased number of transfer requests coming from hospitals that do not have appropriate on-call coverage. One way to decrease the greater financial burden this places on academic centers is to use back-transfers. This is where the larger hospital agrees to provide the necessary specialized care, but then transfers the patient back to the referring hospital for the remainder of the hospital stay.[41]

Research Questions

- Are patients experiencing increased wait times and travel distance for non-EM specialty care?
- Are on-call shortages contributing to ED or hospital overcrowding in both the referring and accepting institutions?
- Are there unnecessary transfers that are overburdening existing resources, both financial and workforce?
- Do increased patient transfers lead to delays in care that affect quality?
- How many ED patients do not receive adequate follow-up because of lack of non-EM specialist availability?
- Does the patient's insurance status affect ED follow-up? Might this change if all patients had insurance?
- How does transfer of care affect patient satisfaction and their perception of care?

Issue: What Are the Root Causes of the Lack of On-call Specialty Coverage?

Lack of adequate reimbursement, particularly with uninsured patients, contributes to the lack of on-call specialists.[47] Universal coverage may help provide incentives for on-call care through increased reimbursement, but it will not fix the problem. Lifestyle issues will still need to be addressed. Until the reimbursement for universal health care has been evaluated, we will not know if some or all of these patients will be considered underinsured.

Legal disincentives are also of significant concern, as all physicians providing emergency care, on-call or not, face higher malpractice costs and potential lawsuits from caring for patients with whom they have no established prior relationship. Tort reform protecting all physicians who provide care under EMTALA would be very helpful in improving the nation's emergency care system. This, in turn, would allow for better access to emergency care for the nation and help ensure that care is available to all.

Physician work-life balance is an important consideration. In a study evaluating medical student specialty choice, it was found that career decisions were largely based on lifestyle.[48] The surgical hospitalist model might be another option to help with the on-call shortage. A model used by some hospitals requires the surgical hospitalist to take call for the hospital and evaluate ED consults as well as write admitting orders for surgical patients. If the surgical hospitalists staffed the hospital 24/7, this would limit call for non-hospitalist surgeons, improving their work-life balance.

A study done in an academic California hospital using three surgical hospitalists found that the mean time to consult was decreased to 20 minutes. Physicians in EDs reported that their patients had shorter lengths of stay using the surgical hospitalist, better patient satisfaction, improved professionalism, resident supervision, and better overall quality of care. Revenue also increased in this study, as the number of billable consults rose by 190%.[49]

Research Questions

- Are there different rates for rural specialists taking call versus urban specialists? If found, what are the reasons?
- Would increased/universal health care coverage incentivize non-EM specialists to take call?
- Would liability reform for EMTALA-related care improve access to emergency care?
- Would a surgical-hospitalist model help alleviate on-call surgical coverage shortages?
- Would payment reform incentivize the emergency care system?

Potential Solutions

Stipends The long-term feasibility of stipends for on-call coverage will vary by hospital. An Oregon study found that eight of the hospitals surveyed were paying stipends in excess of 0.5% of their previous year's operating expenditures. The median operating margin for hospitals in Oregon in 2004 was 2.3%, which shows that stipends can present a significant financial burden.[34]

Determining what amount is fair will be based on each hospital's resources and needs. A study looking at the amount paid to each major specialty across the country may serve as a guide for hospitals when determining what fair compensation is for on-call providers. Hospitals can also look to other hospitals in their region as a basis for determining stipends.

Such payment systems by hospitals attempts to offset revenue lost by physicians not performing more lucrative procedures. Hospitals that compare the marginal revenue from emergency patients to that of elective admissions find that our current payment system financially penalizes those that provide emergency care. A comprehensive reform of payments for hospital and physician services must assure adequate payment for emergency care.

Transfer Arrangements Transfer arrangements between hospitals would make the transfer process more efficient for both physicians and patients and would decrease the amount of time spent finding an accepting physician. This increased efficiency could improve patient outcomes and patient satisfaction associated with the transfer process. Transfer arrangements could also give the receiving hospital the possibility of negotiating a monetary contract to cover the costs associated with providing on-call specialist services and an opportunity for back-transfer.

Transferring patients to tertiary care centers can increase the burden on those hospitals, especially if the patients are uninsured or underinsured. The Oklahoma

legislature in 2004 enacted a ''pay or play'' statute that was geared toward spreading the responsibility of call coverage. The statute required hospitals that do not maintain specialist on-call panels to contribute financially to the plan.[50] This seems a reasonable way for hospitals that do not maintain on-call specialists to relieve the financial burden that is placed on hospitals that do. This resource structure could also help alleviate some of the financial burden incurred by physicians who provide care to the uninsured and underinsured.

Transfer Call Centers Regional or state-based transfer call centers could be one solution to assist patient transfers to hospitals with on-call specialists. The call center could allocate the transfer of care among available hospitals and take the burden off of the referring physician. Ideally, this would allow one phone call to handle the transfer. However, any time regional or state call centers are established, there has to be funding to support them. Where the funding would come from is a difficult question to answer and would likely require support from either local or state government.

Liability Reform Providing liability protection for all emergency care providers who perform EMTALA-mandated emergency care will help decrease the liability insurance burden on physicians and hospitals. This could allow for better access to care for patients by decreasing the fear of litigation for high-risk cases. It would also decrease the overhead cost of providing emergency care. This may increase the number of specialists willing to take call, increase the resources available to provide stipends, and increase resources for the ED.

Regionalized/Coordinated Specialty Coverage If we consider specialty on-call coverage as a limited resource for the health care system, the next logical step would be to maximize the coordination of specialty coverage. Through regionalization of specialty coverage, coordinated efforts by hospitals within a region could ensure appropriate coverage without overlapping care. The cost of on-call care could be better supported through the distribution of costs across the region's participating institutions. Such an approach may more efficiently utilize scarce resources.

Telemedicine Provision of specialty care through telemedicine or other technology could be the next step in ensuring coverage for on-call care. While this solution is only now being piloted at institutions across the United States, the possibilities for improving care are significant. Telemedicine may be helpful in extending the area in which physicians, whether EP or on-call non-EM specialists, can help provide care. This may be a significant benefit to patients who cannot or should not travel to where these physicians practice.

Acute Care Surgery There is movement in the surgery community to have acute care surgeons available, especially in high-volume tertiary care hospitals. These acute care surgeons are immediately available to treat any patient who needs an operation. There includes expansion of the role of the general surgeon to provide other procedures, such as acute neurosurgical and orthopedic care. This is a potential solution for surgical workforce shortages.[41,51–53] Current research has shown that more than half of practicing trauma surgeons favor such a change of practice, and support for change exists within the current surgical workforce.[53] This leads to yet another ''specialty''-trained surgeon, and there is no guarantee that this new specialty will be any more available to provide on-call ED coverage than the current workforce, especially in rural areas.

Research Questions

- What is the average time-to-transfer for ED patients?
- Do transfer arrangements decrease the time it takes a patient to get to the definitive care provider?
- Are transfers creating an increasing burden for tertiary care centers?
- Are transfer call centers a feasible means of providing regional coverage?
- Are transfer call centers feasible on a state/multistate level?
- Would liability reform help incentivize providers to take call?
- Will emergency surgeons be willing to provide coverage for at-need/rural regions currently lacking specialty care?
- Would regionalized specialty care be accepted by private hospital systems?
- What is the effect of regionalization on the ability of smaller, rural hospitals to maintain on-call specialists?

CONCLUSIONS

The provision of emergency care in the United States, regionalized or not, depends on an adequate workforce. ''Adequate'' must be defined in both quality and quantity. The goal is to have enough emergency medicine residency-trained, board-certified physicians, nurses, and non–emergency medicine specialist back-up for every patient in his or her time of need. For the foreseeable future, there will be a shortage of such providers. There is opportunity to define how to get to an adequate number, as well as to identify the most important steps needed to achieve this lofty goal.

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