

**Erika Lynn-Green; Arjun Venkatesh, MD, MBA, MHS; Howard P. Forman, MD, MBA, Yale University**

Contact: Howard P. Forman, [howard.forman@yale.edu](mailto:howard.forman@yale.edu)

## **What is the message?**

Emergency departments no longer just simply sew up wounds or triage patients for more acute care. Screening, diagnostic, and therapeutic services occur in and around the ED, resulting in faster care and major improvements in patient outcomes. Yet, operationally, hospitals are struggling to provide emergency and trauma care effectively. Strategies need to improve admissions, discharges, and patient throughput. In parallel, insurance and other payment policies need to reinforce the new service strategies.

## **What is the evidence?**

Relevant literature, together with experience in high-level emergency department care.

Submitted: June 1, 2017; Accepted after review: June 29, 2017.

Cite as: Erika Lynn-Green, Arjun Venkatesh, and Howard P. Forman 2017. Strategies to Improve Care in the Emergency Department—the De Facto Multispecialty Clinic of the 21st Century. *Health Management Policy and Innovation*, Volume 2, Issue 2.

## **The Rise of the Modern Emergency Department**

After World War II, a series of major pieces of legislation facilitated the rapid growth of community hospitals in the United States (1). At their peak in 1975, hospitals across the country contained 1.5 million beds (2). The most recent estimates, by contrast, show fewer than 900,000 hospital beds, even though the nation's population has grown by 120 percent since the 1940s (3, 4). Better care delivery and changing financial incentives have driven much of this decrease. Hospitals continue to downsize their staff and operations, and even as demand increases, the total number of U.S. Emergency Departments (EDs) continues to fall (5).

The ED has become the de facto multispecialty clinic of this century. The modern ED no longer just serves as the place to sew up wounds or triage and admit patients for more acute care. Sophisticated screening, diagnostic, and therapeutic services occur in and around the ED, resulting in major improvements in stroke, cardiac, and trauma outcomes (6-8). Care that previously would take weeks to deliver can be accomplished within the ED in mere hours. Emergency physicians, clinicians trained in a specialty that is relatively new to medicine, can provide immediate attention to a multitude of traumatic, surgical, medical, and mental health emergencies (9).

In addition to the expansion of services, the ED has become the medical provider of last resort in most communities, serving patients either uninsured or underinsured, as well as insured patients when their personal physicians are unavailable. These patterns of usage have led to a significant increase in demand for ED space, exemplified by the proliferation of "free-standing" Emergency Departments (FSEDs), which are not attached to hospitals (10). The vast majority of FSED patients walk in, rather than arriving by ambulance, and fewer than 5 percent require admission to a hospital, whereas hospital-based EDs admit between 15 and 35 percent of patients (10). The growing popularity of the FSED model indicates a demand not just for emergent care but also for 24/7 availability of many acute and urgent hospital services at the level of an ED.

## **Overcrowding and Boarding**

Even as acute care techniques improve and the expertise of Emergency Medicine providers advances, the modern ED faces persistent operational challenges. Over 90 percent of Emergency Departments report overcrowding at some point during the day, and wait times and lengths of stay are now the preferred, patient-centered metric to evaluate ED care (1).

Rather than arising from an insurmountable increase in patients presenting with non-emergent complaints, solvable workflow and structural issues at the hospital level cause most ED overcrowding (1).

The trend toward downsizing hospital staff and operations has led to less effective and often inefficient bed management, which in turn creates logistical complications that can harm patients. Boarding, for example, occurs when a patient lingers on a stretcher in the ED, often in the hallway, despite having been admitted to the hospital (a confirmation of true emergencies) (11). Often a patient is boarded due to a lack of available beds or to processing delays even if a bed is available. Patients who are boarded have longer overall lengths of stay compared with comparable admitted inpatients and, unsurprisingly, report lower overall satisfaction (12, 13).

The health of boarded patients also suffers. In addition to the discomfort of lying on a stretcher for long periods, boarding results in worse patient outcomes, since inpatient nurses and staff often miss these patients even though they have been determined by a physician to need hospital care (1). Studies show that mortality increases along with the duration of ED boarding (14). Moreover, boarding increases the length of stay for all patients, even those in inpatient beds (1). Stroke patients, in particular, have poorer management and outcomes when EDs are crowded, even though overall stroke care and outcomes have improved through the expansion of ED services (15). Without operational and logistical solutions, the biomedical and technological improvements of the 21st century cannot achieve their full potential, and Emergency Medicine providers cannot practice at the height of their training.

In many other industries, such experiences would lead to rapid operational redesign and surge management to minimize harm. Airlines know how to move hundreds of thousands of travelers after major storms; utility companies, too, know how to manage disasters due to weather events (16, 17). In each of these cases, there is a short-term impairment of services that effective leaders resolve. In healthcare, however, boarding and overcrowding are as bad as ever, becoming part of the day-to-day functioning of EDs and the patients that need their services. This phenomenon is treated as just another inconvenience of being sick, rather than a problem to be solved. That is the puzzle we need to solve in Emergency Department care.

## **Emergencies, Non-Emergencies, and the Link to Primary Care**

ED operational challenges require systemic hospital-level solutions, including the effective parsing of emergencies from non-emergencies to improve the experience of patients and providers, and to reduce cost. In particular, expanded primary care access and the proliferation of alternative unscheduled care settings such as urgent care are potential solutions for excess ED usage and crowding. Quite simply, we need to divert non-emergent complaints to an outpatient provider.

As the ED has grown in response to the acute care needs of the population, outpatient medicine often has become less accessible. Because of the immense range of care available at the ED, primary care and specialty physicians feel more comfortable curtailing their after-hours clinical availability and allowing unscheduled and partially worked-up patients to go to the ED (18, 19). One study found that fewer than half of people with a regular source of care reported that their primary care provider (PCP) offered extended hours at night or on weekends. In contrast, people report significantly fewer ED visits and lower unmet medical need rates when they have access to extended PCP hours (20).

A significant amount of non-emergent and less urgent care is provided in the modern Emergency Department (21). The shift from outpatient care to ED care costs more money, distracts highly valued resources to less critical needs, and disrupts the coordination of care that is better delivered by primary care physicians. The current system, however, frequently pushes patients to the ED or expects them to wait days or weeks for an appointment with their PCP.

This mix of non-emergent care in emergent settings is a long recognized problem. For decades, insurance companies have tried demand-side strategies to reduce unnecessary Emergency Department visits. ED copays are common, though in many cases the copay is waived if the patient is admitted to the hospital (22). Most recently, Blue Cross Blue Shield of Georgia announced that it would stop paying for non-emergent ED care, assessed after the fact by the insurance plan (23).

To the casual eye, this strategy makes sense: if the complaint is not an emergency, the patient should wait to seek outpatient care, typically at a lower cost. It seems logical to align member incentives of lower cost to the patient with the desired behavior of avoiding the ED and obtaining care on an outpatient basis from your PCP or specialist. The problem is that patients cannot always be expected to assess their own state of emergency at home.

This is not any easy problem to solve. In many cases, patients evaluated in the ED and triaged to “primary care” treatable diagnoses were later found to have required emergency management (24). For instance, at an initial stage, physicians often struggle to tell the difference between gastrointestinal tract discomfort and more serious and even fatal conditions. If physicians cannot presciently tell who will and will not require life-saving interventions from the complaint, patients should not be expected to evaluate themselves. Financially punishing patients after the fact for not having a heart attack, stroke, or appendicitis only encourages other patients to avoid emergent care until too late.

## **Operational Solutions and Workflow Interventions**

### **Operational innovations**

Despite the challenges, real solutions are possible. Supply-side strategies on the part of the health system can drive improvements to Emergency Department effectiveness and cost reduction. ED workflow solutions break into three potential categories: decreased patient intake, increased patient dismissal, and improved throughput (1).

In strict terms, hospitals could reduce lucrative elective admissions until they achieve a more manageable equilibrium. However, this strategy would have enormous financial consequences for hospitals, which already operate on low single-digit margins and often depend on ED revenue to break even. Hospitals need a financially viable approach.

Decreasing admissions or increasing discharges per se will also not improve crowding. EDs show considerable variation in their rates of admission and lengths of stay, as patients have a wide variety of needs (25, 26). However, increased efforts to reduce hospital crowding by increasing ED discharges may have a paradoxical effect and exacerbate ED crowding. With reduced admissions, patients require more intensive testing and treatments in the ED itself, which results in longer ED stays and worsened ED throughput (25-28). Hospitals need well-designed systems to streamline care and direct patients appropriately, rather than just treating patients who should be admitted in the ED or rushing patients out of inpatient beds.

Insurance innovations are beginning to recognize this potential. For frail or elderly people at the end of their acute-care hospital stay, a “flipped discharge” where therapists in an active recovery team assessed the patient at home saved 40,000 bed days in a year and reduced readmissions via the ED at a UK hospital system (29). The flipped discharge also

frees inpatient beds and relieves ED overcrowding while improving patient satisfaction. Health plans are evolving to recognize this opportunity, and integrated delivery systems such as Kaiser Permanente are reliably lower-cost due to their attention to patient-centered care delivery.

The third strategy, improved throughput, offers the greatest opportunities. For an immediate and financially viable change, *inpatient* boarding, where admitted patients wait for beds in inpatient hallways instead of the ED, presents a safer alternative to ED boarding (30). Patients overwhelmingly prefer inpatient boarding, which increases overall patient satisfaction scores and thus potentially a hospital's ranking and reimbursement (31, 32). The primary obstacle to throughput innovations such as this comes from the lack of alignment between ED quality measures and overall hospital quality measures. Just as EDs measure left-without-being-seen rates and prolonged wait room times as safety risks and failures in care, inpatient hospital units should measure ED boarding or delays in patients arriving on floor as latent safety risks created by poor inpatient flow (28, 33).

The more challenging long-term solutions involve streamlining care delivery in the ED (27). Posted wait times and ED appointments could reduce stress for patients with less-emergent complaints and facilitate their arrival at lower-demand times. Front-end redesign in the ED, including bedside registration, centralized patient tracking, "zone nursing," where nurses control a defined area, and non-emergent "fast tracks," has contributed to operational and patient outcome improvements in EDs that have implemented these strategies (34). Better bed management strategies at the inpatient hospital level, such as hiring a dedicated bed czar, also help alleviate the bottleneck effect that translates to ED crowding, as a crowded hospital cannot help to absorb ED traffic (35).

Other throughput innovations are possible. Providing telephone consultation services, more accessible primary care services (including extended and urgent care hours), and integrated delivery of health care can also reduce the demand for emergency care while meeting the immediate needs of the population (36). Early evidence suggests that telemedicine can decrease costs, including by reducing ED visits (37). For the truly non-emergent patient, the reassurance from knowing that there is an available consultant may be enough peace of mind (38).

## **Payment innovations**

Throughput innovations such as these will require changes in payment procedures. Current

primary care reimbursement schemes do not incentivize these supply-side innovations. ED solutions must include re-crafting the way we pay for primary care, rather than asking physicians and their staff to perform unpaid labor for the good of the system. Public and private insurance plans are beginning to change their models of reimbursement to physicians and hospitals to incentivize higher value care.

These new reimbursement schemes, in turn, are changing practice patterns and care delivery strategies. Emergency clinicians did not go into this field to take care of non-urgent patients—it distracts from their mission to provide immediate attention to acute emergencies. They, too, would prefer that integrated care delivery models are in place to best care for every patient in a timely, high-quality and accessible way. Punitive demand-side strategies could delay life-saving care and harm patients. Instead, supply-side innovation must lead the charge for better and more responsive care delivery, coupled with demand-side strategies that create payment incentives for the operational improvements.

## References

1. American College of Emergency Physicians. Emergency department crowding: high impact solutions. <https://www.acep.org/content.aspx?id=32050>. Published May 2016. Accessed May 7, 2017.
2. Earl E. 5 statistics about hospital capacity over time. *Becker's Hospital Review*. March 2015.
3. American Hospital Association. Fast facts on US hospitals. <http://www.aha.org/research/rc/stat-studies/fast-facts.shtml>. Published Online Jan 2017.
4. Kish JN. US population 1776 to present. Google Fusion Tables. <https://fusiontables.google.com/DataSource?docid=1GIFBG2ZIBrFrqEW19A1a1RywzNdVvW6RJaK7c9vL#rows:id=1>. Published August 2010.
5. American Hospital Association. Trendwatch chartbook 2016: utilization and volume. <http://www.aha.org/research/reports/tw/chartbook/2016/2016chartbook.pdf>. 2016.
6. Vuong S, Carroll CP, Tackla RD, et al. Application of emerging technologies to improve access to ischemic stroke care. *Neuro Focus*. 2017;42(4):E8.
7. American Heart Association. Coordinated, faster emergency response associated with improved heart attack survival. Late-Breaking Research Meeting Report Abstract 20751. <http://newsroom.heart.org/news/coordinated-faster-emergency-response-associated-with-improved-heart-attack-survival>. Published Online November 19, 2014.
8. Hemmila MR, Jakubus JL. Trauma quality improvement. *Critical Care Clinics*.

2017;33(1):93-212.

9. Zink BJ. A brief history of emergency medicine residency training. EM Resident. <https://www.emra.org/resources/emra-history/a-brief-history-of-emergency-medicine-residency-training/>. Published Online February/March 2005.
10. Harish N, Wiler J, Zane R. How the freestanding emergency department boom can help patients. *New England Journal of Medicine Catalyst*. 2016.
11. American College of Emergency Physicians. Definition of a boarded patient. ACEP Policy Statements. <https://www.acep.org/Clinical—Practice-Management/Definition-of-Boarded-Patient-2147469010/>. Published Online January 2011.
12. White BA, Biddinger PD, Chang Y, et al. Boarding inpatients in the emergency department increases discharged patient length of stay. *Journal of Emergency Medicine*. 2013;44(1):230-5.
13. Pines JM, Iyer S, Disbot M, et al. The effect of emergency department crowding on patient satisfaction for admitted patients. *Academic Emergency Medicine*. 2008;15(9):825-831.
14. Singer AJ, Thode HC, Viccellio P, et al. The association between length of emergency department boarding and mortality. *Academic Emergency Medicine*. 2011;18(12):1324-1329.
15. Reznek MA, Murray E, Youngren M, et al. Door-to-imaging time for acute stroke patients is adversely affected by emergency department crowding. *Stroke*. 2017;48:49-54.
16. Weed, J. Airlines, now more proactive on weather, allow fliers to shift own travel plans. NY Times. <https://www.nytimes.com/2017/01/02/business/flight-weather-delay-change-itinerary.html>. Published Online January 2, 2017.
17. Morrow JH. Storm management: managing the aftermath of a storm doesn't have to be a disaster itself. *Sbusiness*. <http://www.s4growth.com/publications/citations/16.cfm>. Published Online September/October 2004.
18. Staiger DO, Auerbach DI, Buerhaus PI. Trends in the work hours of physicians in the United States. *Journal of the American Medical Association*. Feb 2010; 303(8): 747-753.
19. Gindi RM, Cohen RA, Kirzinger WK, et al; CDC. Emergency room use among adults aged 18-64: early release of estimates from the National Health Interview Survey, January-June 2011. [https://www.cdc.gov/nchs/data/nhis/earlyrelease/emergency\\_room\\_use\\_january-june\\_2011.pdf](https://www.cdc.gov/nchs/data/nhis/earlyrelease/emergency_room_use_january-june_2011.pdf). Published May 2012. Accessed May 7, 2017.
20. O'Malley AS. After-hours access to primary care practices linked with lower

- emergency department use and less unmet medical needs. *Health Affairs*. 2013; 32(1):1-9.
21. Uscher-Pines L, Pines J, Kellermann A, et al. Emergency department visits for nonurgent conditions: systematic literature review. *The American Journal of Managed Care*. 2013; 19(1):47-59.
  22. Galewitz P. Hospitals demand payment upfront from ER patients with routine problems. *Kaiser Health News*.  
<http://khn.org/news/hospitals-demand-payment-upfront-from-er-patients/>. Published February 20, 2012.
  23. Bandlamudi A. Blue Cross Blue Shield of Georgia to launch Emergency Room policy. WABE 90.1.  
<http://news.wabe.org/post/blue-cross-blue-shield-georgia-launch-emergency-room-policy>. Published May 2017.
  24. Raven MC, Lowe RA, Maselli J, et al. Comparison of presenting complaint vs discharge diagnosis for identifying “nonemergency” Emergency Department visits. *Journal of the American Medical Association*. 2013;309(11):1145-1153.
  25. Venkatesh AK, Dai Y, Ross JS, et al. Variation in US hospital emergency department admission rates by clinical condition. *Med Care*. Mar 2015; 53(3):237-44.
  26. Carrier E, Khaldun J, Hsia RY. Association Between Emergency Department Length of Stay and Rates of Admission to Inpatient and Observation Services. *Journal of the American Medical Association Internal Medicine*. 2014; 174(11):1843-1846.
  27. Kocher KE, Meurer WJ, Desmond JS, et al. Effect of Testing and Treatment on Emergency Department Length of Stay Using a National Database. *Academic Emergency Medicine*. 2012;19: 525-534.
  28. Powell ES, Khare RK, Venkatesh AK, et al. The relationship between inpatient discharge timing and emergency department boarding. *Journal of Emergency Medicine*. 2012;42(2):186-96.
  29. Institute for Healthcare Improvement. What if we flipped the patient discharge process?: Video. <https://www.youtube.com/watch?v=KJEyZ1Y5O0w>. Published Online April 11, 2017.
  30. American College of Emergency Physicians. Inpatient hallways a “safe” option for stable patients. *ACEP News*.  
<https://www.acep.org/Clinical—Practice-Management/Inpatient-Hallways-A-Safe-Option-for-Stable-Patients/>. Published Jan 2009.
  31. Viccellio P, Zito JA, Sayage V, et al. Patients overwhelmingly prefer inpatient boarding to Emergency Department boarding. *Journal of Emergency Medicine*. 2013; 45(6):942-946.
  32. Hospital Consumer Assessment of Healthcare Providers and Services. Centers for

Medicare & Medicaid Services, Baltimore, MD.

<https://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-sheets/2017-Fact-Sheet-items/2017-08-01.html>. Published Online August 1, 2017.

33. Patel PB, Combs MA, Vinson D. Reduction of Admit Wait Times: The Effect of a Leadership-based Program. *Academic Emergency Medicine*. 2014;21(3):266-273.
34. Honigman Warner, LS, Pines JM, Gibson Chambers J, et al. The most crowded US hospital Emergency Departments did not adopt effective interventions to improve flow, 2007-10. *Health Affairs*. 2015; 34(12):2151-2159.
35. The Chartis Group. Patient throughput: a critical strategy for success. [http://www.chartis.com/resources/files/whitepapers/pre-2013/chartis\\_group\\_patient-throughput-critical-strategy-for-success.pdf](http://www.chartis.com/resources/files/whitepapers/pre-2013/chartis_group_patient-throughput-critical-strategy-for-success.pdf). Published Fall 2007.
36. New England Healthcare Institute. A matter of urgency: reducing Emergency Department overuse. <http://www.nehi.net/publications/6-a-matter-of-urgency-reducing-emergency-department-overuse/view>. Published March 30, 2010.
37. Uscher-Pines L, Mehrotra A. Analysis of Teladoc use seems to indicate expanded access to care for patients without prior connection to a provider. *Health Affairs*. 2014; 33(2):258-264.
38. Rising KL, Hudgins A, Reigle M, et al. "I'm Just a Patient": Fear and Uncertainty as Drivers of Emergency Department Use in Patients With Chronic Disease. *Annals of Emergency Medicine*. 2016 Nov;68(5):536-543.