



## Future of Emergency Medicine – Patients

Emergency physicians are experts at providing acute, unscheduled care ranging from critical, time-sensitive interventions to urgent, patient-centered care 24 hours a day. As America’s health-care safety net, Emergency Departments (EDs) also provide a wide range of needed primary care, often to the most socioeconomically challenged members of our society. Simply put, Emergency Medicine has become society’s healthcare provider of both first and last resort, providing care no one else can or is willing to provide.

The current COVID-19 pandemic is a unique opportunity to reassess our healthcare system, identify weaknesses, enhance strengths, and promote new alternatives to care delivery, to improve the overall health of our communities. As we consider the future of America’s healthcare system, especially related to emergency care, we should leverage our past experiences in combination with current realities to focus on a future state that efficiently, cost-effectively, and safely provides quality care in fulfillment of public needs.

In the early months of the pandemic, EDs across the county experienced an unexpected and unanticipated impact to the emergency care delivery system in the United States. ED patient volumes **dropped 30-50%** during March and April of the COVID-19 pandemic.<sup>1</sup> Volume declines appeared to occur in men and women equally with the largest volume drops occurring in the pediatric population.<sup>1</sup> Patients stayed away from EDs irrespective of their chronic conditions, diagnostic groupings (e.g., emergency and ambulatory care sensitive conditions), and prior dispositions (admissions, ICU admissions, and transfers).<sup>2</sup>

The cause of these declines was surely multifactorial. Shelter in place orders decreased the number of people venturing out into their communities. This likely reduced motor vehicle crashes and infectious illnesses. Transportation limitations and possibly fears about mass transit may have decreased patients’ access to EDs. Telehealth may have provided alternatives to in-person medical care. Public service announcements such as “*We stayed at work for you. You stay home for us*” may have been misinterpreted by patients thinking healthcare systems were advising patients to stay away from the ED, irrespective of their clinical condition. Finally, in the early stages of the pandemic, hospital systems did little to assuage patient fears of contacting COVID-19 if they chose to come to the hospital or ED.

Volumes in many areas have increased, however, ED volumes remain 10-30% lower in some areas compared to similar timeframes in 2019. Recovery in those areas is not keeping pace with other hospital-based service lines.<sup>3</sup>

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Patient care-seeking patterns during the COVID-19 pandemic suggest that patients’ sensitivity to emotional forces and perceptions may override traditional motivations for obtaining care in the ED, and that these forces are more ubiquitous and powerful than were previously appreciated.<sup>4</sup> Patients showed us that the universal human need to feel safe and their need to understand the health care environment should be central factors in our approach to engaging patients. EM training programs and continuous improvement processes must focus on these fundamental drivers of patient care for the successful evolution of emergency care, even under normal conditions. Actively accounting for these human factors is essential for coordinated responses to future pandemics and other large-scale disruptions, and to the routine provision of clinical care in the future. Now is an opportune time to reevaluate and strategically redesign the impacts of technology, data collection, data analysis, and care coordination between various levels and locations of care, and delineate the influences of emotional and social determinants of health on emergency medicine for our patients.

Emergency medicine’s experience in COVID-19 offers unique learnings, not all of which will be directly applicable to the future of the specialty. However, some experiences have been unusually stark, and have illuminated opportunities to address fundamental issues currently affecting our practices. One such issue is protecting patients and clinicians from infectious diseases in the course of providing even routine emergency care. The insufficiency of personal protective equipment (PPE), PPE supply chains, PPE



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design, and inefficiency of PPE utilization are serious deficiencies unmasked by the COVID-19 pandemic. We must innovate more effective methods of PPE supply and usage, so PPE systems are more reliable, scalable in times of escalating need, have less impact on the physician-patient interaction, and reduce hazardous waste. There may be a future where patients experience innovations such as a sunscreen-like spray for exposed surfaces to neutralize infectious agents on contact;<sup>5</sup> or goggles that emit disinfectant over the face to neutralize infectious particles before they contact mucous membranes; or an inhaled substance that neutralizes virions upon inhalation.<sup>6</sup> Humans are remarkably creative beings. Only time will tell if these or other innovations come to fruition in the patient care spaces. Until that time, traditional PPE remains a critical safety feature of pandemics.

With that said, we must appreciate the human impact of full PPE and facemasks. The face is a significant part of the physical exam. Patient facial expressions provide clinical clues and physician facial expressions are critical to establishing trust and a therapeutic connection. The emergency medicine practices of the future must thoughtfully consider, acknowledge, and accommodate both the diagnostic and empathetic implications of full facial exposure for both clinicians and patients.

The future for emergency physicians and the patients they serve may not be linked to brick and mortar hospitals, but rather linked to new ways of offering emergency medical skills. One opportunity created by the pandemic is the expansion of telehealth. Virtual primary care visits have become routine and at times even preferred. Emergency care has also benefitted from this technology, although unevenly and inconsistently, with tele-triage (a.k.a. remote “physician-in-triage”) and online virtual unscheduled acute care visits. In the future, the patient’s home may become a common site of care. An entirely new industry is emerging, employing emergency physicians to provide this virtual care.<sup>7</sup>

In all probability, patients will more directly engage with technology as we move to the future. One could envision scenarios with physicians, with other providers or possibly even without engaging with a clinician, at lower cost or maybe for free. Patient-computer interactions substituting for patient-clinician interactions could become a reality in certain care situations. Could this type of tele-technology make healthcare less personal? Perhaps, but the same was said of ATM banking machines in the 1970’s. Now, people visit bank locations far less frequently and may prefer a virtual experience instead.

In general, EDs have offered patients the convenience of comprehensive service, unscheduled, on demand, 24 hours a day and

within the context of a single visit. Despite this efficiency, EDs do not provide uniformly seamless or reliable systems for follow-up care, particularly for patients with chronic disease. Telemedicine could address some of these shortcomings and help expand emergency medicine’s influence post-visit further reducing cost. Though telehealth is being used more extensively by primary care, these clinicians are not often unavailable after hours. While large healthcare systems may be able to build integrated systems of care, smaller systems frequently cannot. Coordination across sites and level of care could be enhanced with improved telecommunications to increase access, support consistency, and improve rural and lower levels of care. This is a significant opportunity for emergency physicians seeking to expand access to their services while simultaneously promoting access to care, efficiency, and quality.

Technology, especially communication technology, will play a much larger role in healthcare, including emergency medicine. For example, several EDs have already created online urgent care screening programs evaluating patients in their homes.<sup>8</sup> In some applications, machines do things better, faster, and cheaper than humans. Already, pathology images such as PAP smears and mammograms are screened by computers. With artificial intelligence (AI), computers can improve functionality as they “learn” over time. AI systems will likely expand in scope, initially taking over routine tasks, but eventually more complex tasks. Initial shortcomings of current technologies will probably be overcome in time. Both patients and clinicians will undoubtedly rely more and more on technology in the normal course of providing care. Emergency medicine practices are well-advised to be thoughtful, future-oriented, and solution-oriented when proposing and adopting technology-empowered patient care solutions.

In our clinical future, AI systems could assist clinicians by analyzing information we already utilize and assist with decision support tools, often arriving at a diagnosis and recommended treatment for clinicians to review, verify, and implement. Our practices could benefit from virtual functions that limit risk and infectious exposure, such as “automated ED triage,” from home or a kiosk in the ED. Benefits could include speed, efficiency, thoroughness, consistency, and cost. These processes are already used in highly specialized healthcare. For example, cancer treatment protocols are designed by computers based on research available from around the world.<sup>9</sup> Technology makes these tasks possible for humans. Many other clinical disciplines, including EM, are likely to adopt similar solutions in the years ahead.

Advances in technology and AI will support increased use of patient biomedical health tracking in the home. Coordinated



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technology could be pivotal to remote communication as well as containment systems to reduce spread of disease. It is likely these technologies could assist in the development of cleaning systems and masks with advanced filtration systems that will be more functional for the ED environment.

The entire emergency care team will need new skills and training. Medical student and resident education will be more virtual, employing virtual reality and artificial\augmented intelligent systems. Technology will enhance the ability to conduct the physical examination remotely and supervision of residents in training from a distant site as well.

COVID-19 has cast a light on health and care disparities in the US. Reasons for these disparities are many and are not unique to the current crisis but may have been amplified by it. True solutions will require unprecedented cooperation, which are highly challenging and additionally charged by social and political considerations. Nevertheless, emergency medicine tends to be at the forefront of the many ways this issue presents itself in our communities. As a result, we have both an incredible opportunity, and an earnest obligation to embrace these challenges, and bring solutions. We highly suggest that we commit to additional exploration of our pivotal role in bringing solutions to even these longstanding and expansive issues.

In addition to providing high-quality care for acute and unscheduled conditions, future EM practices will increasingly be oriented toward public and population health considerations. For example, EDs could be an efficient site for vaccinations, assuming reimbursement barriers can be removed. Syndromic surveillance is also a critical need for future pandemics as EDs are a frequent and focal site for identification of a contagion is identified, and often serves as the epicenter of care for the communities they serve.

The wide spectrum of information currently in the electronic health record (EHR) and the potential for additional, easy to access patient-specific determinates of health could be powerful data tools to identify impactful social determinants of health in patient populations. These tools could provide physicians, emergency department staff and care-coordinators with the information they need to care for the whole patient. Currently there are ways to find sources of less expensive medications. Similar systems should be developed for other issues such as housing and food security. With the appropriate tools and data embedded into the EHR, emergency departments can play key roles in improving the care and care equity our patients receive.

Patient expectations will continue to increase. Many businesses have taken extraordinary lengths to assure the public it is safe to utilize their services, and health care should be no exception. Visitor limitation due to COVID-19 needs to be balanced with family and patient advocate needs. More robust video conferencing with the family and enhancements within the patient communication portals in the EHR could extend acute and follow up care outside of the four walls of the hospital.

It is also likely that federal and state patient safety accreditation requirements will increase particularly around infection control in the ED, employee safety and testing, and patient safe environments including patient PPE. Additional PPE will likely be necessary as our understanding of the role of droplet, short term airborne and asymptomatic spread of diseases has grown. At the same time, multistate licensing and unnecessary regulatory barriers for telehealth need to be addressed in to optimize the role of the future ED in population health.

Many things have changed for patients and emergency physicians with the COVID-19 pandemic. Many things will continue to change. One thing that will not change is the undeniable fact that physicians are now, and will continue to be, the safety net for the health care system. Patients come to the ED for our skills and for our service. They come because the “light is always on” and we are open at all times.

In our future, patients will have many options for their care. Right now, we have the opportunity to be part of the innovations and solutions to help our patients choose a future of high-quality emergency care across a spectrum of venues. Our specialty will be well-served if we dedicate time, effort, and resources to our patients’ experience in the ED when they choose to access emergency care. This will require early emphasis in professional training, effective team-based strategies, clear communications with our patients, continued expansion of technologies, and a new focus on patient-centered population health approaches in the hospital and in the ED. We feel confident that emergency physicians will leverage past experiences, the wisdom gained during the pandemic and novel care-expansion innovations to create the best possible future for our patients. ■



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