Right care, right place, right time

Regional systems of care are the best way to ensure patients with emergent conditions have the best outcomes.

BY JOHN L. HICK, MD

A bystander calls 911 after witnessing an auto accident in rural Minnesota in which a passenger has been seriously injured. The dispatcher provides the caller with instructions on how to care for the person until the ambulance arrives. When emergency medical services personnel get to the scene, they find that the patient meets the criteria for trauma and activate a “trauma code” at the local hospital. Upon receiving that radio notification, the hospital calls in additional staff and also calls for a helicopter to transfer the patient to a tertiary trauma center. Staff at the receiving hospital do an initial assessment and stabilize the patient. Helicopter personnel provide additional medications and interventions en route to the trauma center, where a specialty team is ready to deliver definitive care.

This story illustrates how seamlessly emergency care can be delivered when a regional system is in place. In this case, the patient received the best care possible in the shortest amount of time because all members of the medical team—from the first responders to the local hospital staff to the regional trauma center staff—knew what to do and when. In Minnesota, 95 percent of hospitals participate in our statewide trauma system, with Regional Trauma Advisory Councils providing educational and quality assurance support (and in some cases research) in their areas, and the Minnesota Department of Health providing the regulatory and data support to the system.

Although we have developed regional systems of care for trauma across Minnesota, we are only part way toward having coordinated regional systems of care for other medical emergencies. Change the story above—substituting a stroke, myocardial infarction, burn, pediatric or Ebola patient for the trauma victim—and you can see the benefit of regional systems for these time-critical emergency conditions as well. To some extent, regional systems are in place, but they are only in parts of the state and some are more refined than others.

The trend toward regionalization

It is clear that we need to move toward regionalization of care for an increasing number of conditions, so that each facility involved delivers appropriate and timely care in order to ensure the best patient outcomes. The 2010 Institute of Medicine report “Regionalizing Emergency Care” emphasized the need to expand regionalization of emergency care to diagnoses other than trauma. That report called for high-functioning systems that are “regionialized, coordinated and accountable.” That means facilities can manage patients locally when it is safe to do so or refer them to a specialty center when appropriate. It also means we have formal programs and oversight of them to assure access, promote quality and control cost (as opposed to an uncoordinated system that is at the whim of market forces). And it means we share data to improve quality of care and ensure that there are consequences for not meeting performance standards.

We know that taking a systematic approach to emergency care—one that assures optimal assessment and interventions at each level within a system—saves lives. The American Heart Association’s “chain of survival” concept for cardiac arrest care, which has been around for years, is an example. More recently, the military has proven that its Joint Theatre Trauma System, which calls for aggressive care beginning at the point of injury and progressing step-wise and rapidly through to definitive care, clearly saves lives as well.

Minnesota has been on the leading edge of the movement to regionalize emergency care for some time. Some of the earliest research on the safe transfer of patients with ST-elevation myocardial infarction (STEMI) from outlying facilities to cardiac centers took place in the state. Prehospital activation of catheterization laboratories by EMS units with transport to select STEMI facilities is now the norm in the metro area, and protocol-driven initial care and referral of these patients for intervention occurs in many other areas of the state.

Sixty-seven Minnesota hospitals have earned the American Heart Association’s “Stroke Ready” designation, assuring that 81 percent of Minnesota’s population is within 30 minutes of a stroke center; additional facilities have applied for the designation. In urban areas, acute stroke patients are directed to designated primary or comprehensive centers for initial care. In nonurban areas, initial assessment and treatment of strokes occurs at hospitals that are designated “Acute Stroke Ready,” which means staff can perform initial diagnostics and administer thrombolytic therapy if indicated. Patients are then referred to a primary or comprehensive stroke center. With effective interventions that can be initiated in outlying hospitals and augmented with endovascular interventions at the receiving stroke center, we are better meeting the needs of patients with acute stroke.
More work to do
Although we have made a great deal of progress, our regional emergency systems differ greatly in how well they are organized and used. The Minnesota Department of Health is just now establishing coordination of the stroke care system, despite the fact that we have many verified stroke centers.

Over time, with consistent standards and data-sharing, our systems should improve. We will hone our triage and referral protocols and continue to monitor our referral patterns. Even our trauma system will continue to evolve and improve.

Minnesota’s rural-urban referral pattern is relatively typical. More than 50 percent of major trauma patients present to Level 3 and Level 4 trauma centers, which are often smaller hospitals in nonmetro areas.10 These centers must quickly recognize major trauma, provide stabilization and arrange for transfer to a higher level of care. Staff also must identify which patients can be safely managed locally (including those who require immediate surgery, in the case of Level 3 centers). Reducing over-referral is important not only to the patient and their family but also to the hospital, as every transfer is lost revenue for facilities that often operate on very thin margins.

In urban areas, we must balance having enough facilities to provide capacity with having enough cases to maintain excellence. Having five Level 1 trauma centers in downtown Boston may have seemed excessive—until bombs were detonated at the Boston Marathon.11,12 Minnesota has eight health and medical preparedness regions, each of which has coalitions, hospital compacts and organizations that can provide coordination should a disaster occur. As we plan for disasters, we will need to use these regional structures to assure distribution of casualties as well as coordination of EMS, hospital, public health and emergency management responses.13

Under the same regional disaster-planning structures, we continue to advance regional planning for mass burn care and have developed resources for pediatric mass casualty care in conjunction with Minnesota’s Emergency Medical Services for Children and other programs.14 Our state trauma program also includes pediatric preparedness as a component of its mission. There are many opportunities for crossover between our regional systems, and we should leverage them to make communication and coordination more seamless and participation by facilities easier.

As our systems and technologies mature, information sharing will become easier, speeding consultations and transfer and treatment decisions. In many cases, the sharing of images for interpretation at larger centers will allow patients to stay at an outlying hospital safely or enable a receiving facility to be better prepared to intervene when the patient arrives. Virtual reality technologies including wearable “point of view” cameras and receivers will enhance emergency telemedicine capabilities.

As research further defines categories of patients that can be safely managed with minimal specialist input (eg, those with small brain contusions), we will continue to change our recommendations about who can be managed where. Also, the advent of new CPR and resuscitation techniques and technologies will have an effect on how we design our emergency response systems. Such changes likely make cardiac arrest the next focus for regional emergency care.

Thirty-five years ago, myocardial infarction mortality was 40 percent. Today it is 4 percent. Advances in cardiac care have been profound, thanks to the systematic and regionalized emergency care systems we see in most areas today. In another 35 years, will we look back at changes in ventricular fibrillation survival with the same awe? Reductions in mortality are achieved when we provide the right care in the right place at the right time. Minnesota is ahead of the curve in this regard, but it will take our collective, continued effort to continue to lead. Strong and effective medical leadership will be critical to the success of these regional systems. Physicians need to participate on oversight and site-visit teams, in education and in quality-improvement efforts. They need to be committed to and advocate for the planning, policies, data-sharing, analysis and quality improvement these systems require to be effective. MM

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REFERENCES