

## Some Patients Can't Wait: Improving Timeliness of Emergency Department Care

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### Case Objectives

- Define the emergency department triage process
- State the root causes and dangers of emergency department crowding
- Use waiting room patient reassessment to improve emergency department triage
- Apply team-based communication strategies to healthcare scenarios
- Articulate barriers and solutions to effective communication between healthcare providers

### The Case

A 46-year-old woman with a history of a stroke ten months prior, methamphetamine use, and remote endovascular repair of a thoracic aortic dissection, presented to the emergency department (ED) triage nurse at 12:38am with a chief complaint of abdominal pain and vomiting. Her vital signs included: blood pressure 154/113 mmHg, heart rate 75 beats/minute, respiratory rate 16 breaths/minute, room air pulse oximetry 98%, and oral temperature 36.6°C. The triage nurse assigned Emergency Severity Index (ESI) category 2. Because the ED was busy with no available beds, the patient remained in the waiting room. No further nursing assessments or vital signs were recorded until 5:40am when the patient became increasingly tachycardic, tachypneic, and pale, and began to scream in pain on the waiting room floor. She was taken immediately to the resuscitation room and was assessed by the Emergency Medicine attending and resident physicians. The ED care team obtained vascular access, sent a battery of laboratory tests, and ordered imaging studies. The lactic acid value was 10.2 mmol/L (normal 0.9 - 1.7 mmol/L). A contrast-enhanced CT scan of the abdomen and pelvis was performed at 7:00am and revealed a ruptured thoraco-abdominal aortic aneurysm. The emergency physicians immediately consulted the Vascular Surgery team, which evaluated the patient at 7:30am and agreed to take the patient to the operating room (OR). Surgery was scheduled at 7:54am as a 0-2 hour case while surgical staff prepared the specialized vascular OR. The patient's ED nurse called the OR to arrange transport and was told someone would be down to transport the patient to surgery in 30 minutes when the room became available. At 8:57am, while still in the ED waiting for the OR, the patient developed hypotension and agonal respirations. She then became unresponsive and pulseless. The team called a code blue, initiated cardiopulmonary resuscitation, and administered blood products. Unfortunately, she could not be resuscitated and died in the ED.

## The Commentary

By David Barnes, MD, FACEP and Rita Chang, MD

Three key factors contributed to a poor outcome for this patient. First, ED crowding led to a significant delay for a patient with a high-risk presentation. Second, nursing staff did not reassess the patient while she was in the waiting room. Third, ineffective communication between the patient's healthcare teams caused a delay in her transfer from the ED to the OR. Although there is uncertainty as to whether anything could have been done to arrest a process with very high mortality (even with surgical intervention), critical analysis of a severe adverse event can help to identify and close existing gaps and implement processes to reduce the future likelihood of such outcomes.

### Triage and ED Crowding

The Emergency Department (ED) benefits the community by serving as a resource for (possibly critically) ill and injured patients 24 hours a day, 7 days a week. Yet, the universal accessibility of the ED is simultaneously its greatest weakness as patients arrive at all times of day and night, unscheduled, and without knowledge of existing resource availability.

To accommodate the arrival of patients across a continuum of severity and stability, EDs use the process of triage to sort and categorize patients. The purpose of ED triage is to "prioritize incoming patients and to identify those who cannot wait to be seen."<sup>1</sup> It is self-evident that some chief complaints are minor and non-

urgent, while others require immediate intervention to avoid loss of life or limb or serious possibly life-threatening complications. Most fall somewhere between these extremes. When the ED is at or above capacity, staff must determine how to allocate limited resources.

Most U.S. EDs use the ESI triage system to sort patients into priority categories based on presenting complaint, initial vital signs, and a visual assessment. Usually performed by a registered nurse, the ESI is a “five-level triage algorithm that categorizes emergency department patients by evaluating both patient acuity and resource needs.” Patients categorized as ESI-1 comprise <1% of patients but require immediate life-saving interventions such as cardiopulmonary resuscitation, defibrillation, or airway management. Patients categorized as ESI-2 comprise 10-20% of ED patients and present with confusion, disorientation, lethargy, severe pain, severe distress, or with high-risk features. A high-risk patient is one “whose condition could easily deteriorate or who presents with symptoms suggestive of a condition requiring time-sensitive treatment” or “who has a potential threat to life, limb, or organ.” ESI-2 patients are high priority and should be placed into a treatment bed as soon as possible. Patients categorized ESI-3 through ESI-5 are less acute and predicted to require fewer resources.<sup>1-3</sup>

Despite an early morning presentation and high-risk history, this patient encountered a substantial delay to room placement for evaluation and treatment. Moreover, she was not reassessed, nor were her vital signs repeated, during a five-hour period in the waiting room. One must wonder if she would have been diagnosed earlier and her death might have been prevented if she had been roomed sooner or reassessed while in the waiting room.

### Teamwork and Communication

The delivery of healthcare is increasingly team-based. Indeed, the Accreditation Council for Graduate Medical Education (ACGME) requires all residents to work in interprofessional teams as part of the Common Program Requirements.<sup>4</sup> The ED is a prime example of interprofessional healthcare delivery: ED teams are comprised of physicians, nurses, technicians, pharmacists, advanced practice practitioners, phlebotomists, social workers, paramedics, and other allied health professionals. The ED is also the one place in the healthcare system where virtually all specialties convene.

Although team-based care is now routine, communication failures between team members (e.g. physicians and nurses) as well as between teams (e.g. ED and surgery) may contribute to medical error. The Joint Commission (TJC) notes that the “most common root causes of sentinel events are human factors, leadership, and communication” and has identified ineffective communication as the cause of 80% of medical errors.<sup>5,6</sup>

In the present case, the staff moved the patient promptly to the resuscitation bay after she deteriorated. The ED physicians quickly identified an acute, life-threatening aortic syndrome and consulted the appropriate surgical specialist who responded and acted in a timely manner. Despite the initial sense of urgency, there was a substantial delay in OR readiness: although her condition was critical, more than 60 minutes elapsed after the case was scheduled until her cardiac arrest from hemorrhagic shock.

Communication failures are distributed equally among all phases of surgical care. Differences in perceptions between team members in this case may have created opportunity for error. While some delay

related to OR setup may have been unavoidable, it is likely that improved communication between the ED physicians and nurses, vascular surgery team, and OR staff would have expedited OR setup and possibly led to a different outcome.<sup>7</sup>

## **Systems Change Needed/Quality Improvement Approach**

### ED Crowding and Boarding

Unfortunately, most patients who present to an ED in the U.S. wait to be seen. Nationally, only 40% of patients are seen within 15 minutes of arrival, and over 1% of patients leave the ED without being treated by a qualified medical provider (QMP), presumably because of long wait times.<sup>3,8</sup>

The primary cause of delayed care after triage is ED crowding, sometimes referred to as overcrowding. ED crowding occurs when the number of patients waiting to be seen exceeds the number of staffed available beds in which to treat them. A report from the American College of Emergency Physicians (ACEP) subcommittee on ED crowding noted “it impedes efforts of ED personnel to provide care to patients, stretching resources, delaying treatment and leading to poorer patient outcomes. It also causes patients to leave prior to being evaluated by a physician or other provider, and may lead to ambulance diversion.”<sup>9</sup>

Out of necessity, ED staff resort to unconventional practices such as treating patients in hallways. With over 90% of EDs reporting routine crowding, it is a major barrier to timely emergency care as patients “often face long waiting times to be treated and, for those who require admission, even longer waits for an inpatient hospital bed.”<sup>9,10</sup>

Although the nature of ED crowding is complex, a simplified conceptual framework serves as a useful tool for policymakers, researchers, and administrators to contemplate solutions to the problem. Asplin, et.al., describe a model of ED crowding using three interdependent components: input, throughput, and output. *Input* pertains to factors outside of the immediate control of the ED, such as patient disease factors and community attitudes, that create demand for ED services. *Throughput* is most frequently defined and measured by ED patient length of stay and is driven by the time taken for triage, room placement, and the initial physician evaluation (phase 1), as well as by time spent diagnosing and treating patients (phase 2). The third element of the crowding model is *output*, most often determined by the inability to move admitted ED patients to inpatient units.<sup>10</sup> Most crowding experts identify ED boarding, the process of keeping admitted patients in the ED because of lack of inpatient bed availability, as the root cause of crowding in most EDs.

The consequences of ED crowding and boarding are well established and include negative effects on patients (e.g., increased mortality, readmission, and medical errors), staff (e.g., increased stress, violence towards staff), and the healthcare system (e.g., increased ED and inpatient length of stay).<sup>11,12</sup> While operational details of the ED are not available for the period when this patient arrived, we can assume that crowding played some role in her outcome because ED bed placement was delayed. Had the necessary resources been available when she first presented, diagnosis and treatment would have commenced several hours earlier.

Despite high levels of ED crowding, there is mounting pressure to see more patients in less time and often with fewer resources. Numerous interventions and system changes target ED crowding; however, the

problem is worsening and threatens the delivery of timely, safe emergency care.<sup>13</sup> Unfortunately, easy fixes to crowding are elusive.

Some institutions have successfully addressed crowding through bold strategies broadly referred to as full-capacity protocols activated when a predetermined threshold of ED volume, acuity, or boarding is exceeded. The Stony Brook full-capacity protocol, for example, requires admitted ED patients to be moved to inpatient hallway spaces even if inpatient beds are not ready.<sup>14</sup> Other strategies include smoothing operating room schedules,<sup>15</sup> implementing community paramedicine programs to reduce ED utilization,<sup>16</sup> around-the-clock hospital discharges,<sup>17</sup> performance incentivization,<sup>17</sup> and the use of discharge lounges.<sup>18</sup> Because ED crowding is most often due to boarding caused by inpatient bottlenecks, ED medical directors should work closely with hospital administrators and inpatient stakeholders to develop local strategies to reduce boarding. In most cases, more than one strategy is required.

### Triage Process

Delays due to ED crowding and boarding are outside the immediate control of any one individual.

However, staff have many opportunities to affect the care and supervision of waiting room patients. ED staff are obligated to monitor patients in the waiting room, to escalate care when a patient's condition changes, and to advocate for patients' safety. Issues relevant to this case include accuracy of the triage level assignment, time spent in the waiting room, and performance and frequency of patient reassessment.

While there is some evidence that the ESI framework may lead to both over- and under-triage, the nurse appropriately triaged this patient as ESI-2 based on vital signs, appearance, and high-risk past medical history.<sup>2</sup> Criticism of the ESI designation is unwarranted given the absence of ESI-1 criteria, despite an elevated blood pressure and complex past medical history.

Although ESI-2 patients should be roomed as soon as possible, ED crowding presents a substantial barrier to timely care. Unfortunately, the ESI does not specify a timeframe to room placement nor to evaluation by a QMP. Most observers would agree that a 5-hour delay for a patient with high-risk features is unacceptable by any standard, even when the ED is crowded.

It is possible that staff would have identified the patient's condition or deterioration earlier had she been reassessed. Vital signs are not always helpful in the identification of high-risk patients; in fact, vital signs assessment is only required for ESI-3 patients to determine if escalation to ESI-2 is warranted.<sup>1</sup> Nevertheless, measuring vital signs is usually required by local policy and is good clinical practice.

Patient reassessment is important, especially in the waiting room where patients have yet to receive treatment and are unmonitored. Patients with dangerous medical conditions and traumatic injuries may present with normal or near-normal vital signs and may initially appear stable, but then decompensate over time as their true severity becomes apparent. However, regulatory requirements for waiting room patient reassessment do not exist.<sup>19</sup> By not explicitly stipulating minimum reassessment intervals, the ESI workgroup tacitly acknowledged that many EDs would fail to meet a pre-determined time standard exposing them to unnecessary liability, especially those already burdened by high rates of crowding and boarding.<sup>1</sup> Some experts have recommended standards for ED triage reassessment.<sup>19</sup> The hospital in this case had previously adopted a policy that waiting room patients undergo reassessment every two

hours. However, the staff failed to follow the policy and the patient's condition worsened unnoticed.

Ironically, new requirements may worsen this problem. In July 2019, TJC began requiring EDs to screen all patients for suicide risk (National Patient Safety Goal 15.01.01). Those patients identified as high-risk for suicide are designated ESI-2 even if they appear comfortable and have no medical complaints, normal vital signs, and no high-risk historical factors. Prioritizing these patients, who require direct supervision, triages them ahead of many complicated, sick medical and trauma patients.<sup>20</sup>

Several strategies exist to help crowded EDs minimize harm and reduce delays for patients who would otherwise wait for evaluation, treatment, and bed placement:<sup>21</sup>

- Pull until full – Bypass the triage process when beds are available, decreasing door-to-provider time.
- Rapid intake process – A dedicated area used to initiate care, hold patients awaiting diagnostic tests, and discharge patients who do not require a bed. A QMP may initiate and complete the care episode in this area.
- Nursing protocols – Reduce wait times by initiating diagnostic testing and treatment prior to examination by a QMP. Also known as advanced triage, standing orders, standard operating procedures, and nurse-initiated protocols, these protocols usually include phlebotomy and explicit care pathways based on chief complaint.
- Reserving inpatient beds at triage – Some studies suggest that it is possible to reliably predict the need for admission at triage. This process accelerates the bed inpatient assignment process.
- Flow coordinators – Dedicated nursing staff to control flow into, within, and out of the ED, including the waiting room.

Analysis of the present case suggests that more frequent waiting room reassessment could also be considered as a mechanism to improve triage. Providing closer supervision through more frequent reassessment proportional to patient risk is an appealing concept. Unfortunately, utilizing staff for this purpose could divert existing ED resources from providing the direct care those same patients need.

The use of quality indicators can improve the longitudinal effectiveness of the triage process. Random chart audits, evaluating rates of over- and under- triage, analyzing triage provider interrater reliability, critiquing time interval performance (e.g., ED arrival to room placement), and reviewing near misses and adverse events can all improve the effectiveness, efficiency, and accuracy of ED triage.<sup>1</sup>

### **Teamwork and Communication**

Communication is “a process by which information is exchanged between individuals through a common system of symbols, signs, or behaviors.”<sup>22</sup> When that process breaks down in the healthcare setting, medical errors are more likely to occur. Health professions education remains largely discipline-specific, with minimal interaction between healthcare disciplines. Cross training between disciplines, including learning the roles and responsibilities of other team members, and periodically reviewing communication processes, may reduce educational barriers to communication.<sup>23</sup> In the current case, ED and OR staff could collaborate to create specific workflows and clinical pathways to improve the efficiency of care for patients with surgical emergencies, especially targeting handoffs and patient transportation. A designated liaison between the ED and OR could simultaneously address geographical and organizational barriers.

When boundaries defining clinical responsibility blur, communication can fail (organizational). Most communication failures are verbal and occur between a single transmitter and a single receiver.<sup>23</sup> In the current case, the ED nurse spoke with an OR staff person to arrange transportation and was told someone would be down to transport the patient to surgery. However, no team member verbalized a specific transportation plan or time expectation.

Teamwork requires communication, cooperation, coordination, and shared goals. While the patient's destination may have been clear to all team members in this case, improved communication between ED and OR teams could have accelerated OR readiness and established a clear plan for ED-to-OR transit.

Improved communication—including role clarity, strong leadership, and verbalization of goals—can improve patient care. One way to accomplish this is to use a validated toolkit such as Team Strategies and Tools to Enhance Performance and Patient Safety (Team STEPPS). Team STEPPS, developed by the Department of Defense Patient Safety Program and supported by the Agency for Healthcare Research and Quality (AHRQ), is “an evidence-based set of teamwork tools, aimed at optimizing patient outcomes by improving communication and teamwork skills among health care professionals.”<sup>24</sup> Its core competencies—leadership, situational monitoring, mutual support, and communication—serve as the foundation for an instructional framework to develop a shared mental model amongst healthcare team members. Two Team STEPPS tools may have aided the teams in this case: team huddle and closed loop communication.

A huddle is a brief, face-to-face meeting of team members to facilitate the exchange and sharing of information. It is a “team-building tool that increases effective communication among healthcare providers.”<sup>24</sup> During huddles, team leaders verbalize critical details, establish team goals, and foster situational awareness for all team members. Huddles also reduce hierarchies by providing a safe and respectful environment for other healthcare professionals to voice their concerns and opinions.<sup>24</sup>

Closed loop communication is used to confirm task completion. A receiver acknowledges a sent message and cross-checks the accuracy of that message with the sender to ensure the transferred information was received as intended, thus mitigating the risk of miscommunication and misunderstanding. Closed loop communication promotes shared goals, expectations, and execution of care plans.<sup>24</sup>

One way to practice team-based communication, including huddles and closed loop communication, is through the use of simulation, “an artificial representation of a real world process to achieve educational goals through experiential learning” utilizing “aides to replicate clinical scenarios.”<sup>25</sup> A recent focused review of simulation used for acute trauma resuscitation found that simulation-based training improved teamwork, task performance and speed, knowledge, and provider satisfaction.<sup>26</sup> Another found that team-based simulation training improved team performance during emergency resuscitations.<sup>27</sup>

Four separate teams attended to the patient in this case: the emergency physicians, the ED nurses, the vascular surgery consultant, and the perioperative team. Most healthcare providers know the critical actions necessary to care for a critically ill patient but executing those behaviors and skills in real-time is challenging without prior experience. This is even more difficult when coordination between unfamiliar teams is required. Since many providers have little or no experience with rare clinical scenarios, operationalizing team-based resuscitation for high-stakes conditions in real time without practice is

challenging. Regular simulation training can bridge the gap between “knowing” and “doing” and improve teams’ ability to mobilize, communicate, coordinate, and execute the required tasks and behaviors necessary to improve patient outcomes.

## Take Home Points

- ED crowding is a major problem that threatens patient safety. The ED is a public health resource; therefore, policymakers and administrators should prioritize ED crowding as a public health crisis and develop temporary and permanent solutions to remedy it.
- ED staff have a responsibility to keep patients safe and to provide timely care. To improve waiting room safety, hospitals should implement strategies to improve triage accuracy, expedite care, and monitor patients waiting to be seen to reduce the risk of waiting.
- Effective teamwork and communication between healthcare teams and providers is necessary for efficient, high quality health care, especially when treating complex medical or surgical emergencies requiring interdisciplinary and interprofessional coordination.
- Closed loop communication, developing shared goals, and situational awareness developed through huddles are tools to improve teamwork and communication. Healthcare providers should train in teams to support a team-based healthcare delivery paradigm.

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