

Patient Safety Tip of the Week

February 8, 2022

ED to Inpatient Delays Increase Mortality

A study from England has revealed a disturbing finding regarding the relationship between long stays in emergency departments before admission to the hospital and mortality rates. Jones et al. ([Jones 2022](#)) found that delays to hospital inpatient admission for patients in excess of 5 hours from time of arrival at the ED are associated with an increase in all-cause 30-day mortality. In fact, there was a predictable dose–response effect for delays between 5 and 12 hours (accurate data were not available beyond 12 hours). For every 82 admitted patients whose time to inpatient bed transfer is delayed beyond 6 to 8 hours from time of arrival at the ED, there is one extra death.

There was a 10% increase in the SMR (standardized mortality rate) within 30 days for admitted patients remaining in the ED between 8 and 12 hours in comparison with those who leave the ED within 6 hours

Below are the adjusted absolute mortality rates as a function of time spent in the ED:

up to 4 hours	8.2%
4-6 hours	9.2%
6-8 hours	9.9%
8-12 hours	10.1%

We’ve long recognized the impact posed by delays in moving patients from the ED to inpatient beds. In our January 29, 2013 Patient Safety Tip of the Week “[A Flurry of Activity on Handoffs](#)” we noted that back in the 1990’s we realized that patients with community-acquired pneumonia at some renowned organizations were not getting their first dose of antibiotics for up to 18 hours. That, of course, was related to bottlenecks in moving patients from the ED to the floor and problems with handoffs (relating to both information transfer and transfer of responsibility for managing the patients). Fortunately, we had performance improvement projects that focused on ensuring timely administration of the antibiotics regardless of physical location of the patient.

The authors of the Jones study pose several potential explanations for their findings:

- Long lengths of stay in the ED are associated with exit block and crowding, which has been shown to increase time to analgesia, time to antibiotics and time to other vital treatments

- Lack of ED space leads to mitigation processes with patients accommodated in suboptimal areas that make it more difficult for close observation and for the delivery of good care
- Long periods in the ED usually reduce temporospatial clues (eg, patient unable to see the external environment) with consequent increases in disorientation and precipitation or exacerbation of delirium, especially in elderly patients
- Long waits in the ED, especially for elderly patients, are correlated with an increase in subsequent hospital length of stay. This, in turn, increases the risk of hospital-acquired infection, iatrogenic harm and physiological and psychological deconditioning
- Delayed admission (exit block) from the ED is usually related to bed occupancy levels, which are highest in the late afternoon and usually lower around midnight. Thus, a disproportionate number of delayed patients are moved to a ward during night hours when staffing levels are at their lowest

We'll add several of our own potential explanations. Several things happen when there are long delays before patients are admitted from the ED to the inpatient services, each of which may contribute to worse patient outcomes:

- **Overcrowding, less attention**
When the bottleneck of inpatient beds occurs, the census in the ED increases. As that ED gets busier, the physician and nursing staffs in the ED have less time to spend with each patient and often prioritize new patients over those that have been in the ED for longer periods of time.
- **Dispersion of responsibility**
In cases where the decision is made to admit the patient to a specific service, it must be crystal clear who is assuming responsibility for care of the patient while that patient is awaiting a formal bed on the inpatient service. All too often we see examples where the inpatient team thinks the ED team is providing care and vice versa.
- **Delay in orders being carried out**
This is a biggie! Often admission orders are written/input once the decision to admit is made. But those are often expected to be carried out once the patient arrives on the inpatient floor. In several of our columns on sepsis, it's been noted that the first dose of antibiotics is timely but the delay in formal movement of the patient to an inpatient bed often results in a delay in the second dose of antibiotics. And we already mentioned the historical observation that patients with community-acquired pneumonia (CAP) often had long delays in receiving antibiotics because of the delays in formal transfer to the inpatient units. So, just as there must be clarification of physician responsibility for the patient, there must be clarification nursing responsibility for the patient once admission orders have been made but the patient has not yet been moved.
- **Change of shift/Handoffs**
If a patient is in the ED for such long periods of time, there is a good chance there may be at least one change of shift for both nurses and physicians. With each change of shift there are handoffs, which present opportunities for vulnerability. Good handoffs require an environment that is quiet, insulated from distractions

and interruptions, and provides sufficient time for two-way conversations where the recipient has opportunities to ask questions and get clarifications. The often hectic ED environment may not be optimal for smooth handoffs.

- **Monitoring issues may occur**

Many of the patients awaiting transfer to an inpatient bed still require physiological monitoring. When the ED gets overcrowded, there may not be enough monitoring equipment for all patients. Patients moved from an ED room to a gurney in the hallway sometimes lose their monitoring capabilities. And consider how the increased total number of monitors in the ED increases the likelihood of alarm fatigue.

Focusing on the bottleneck(s) elsewhere in the hospital is of utmost importance. Having a nursing “**bed coordinator**” may be useful. That individual works with the clinical teams to identify patients ready for discharge today or “likely to be ready for discharge tomorrow”. During periods of high inpatient occupancy, a “**discharge lounge**”, where patients simply waiting for transportation home, may make sense. Sometimes, even the simplest of problems can delay freeing up inpatient beds. We’ve seen cases where hospitals are unaware of where all their wheelchairs are located, leading to delays in moving patients out (good opportunity for some of the tracking technologies we discussed in our June 16, 2020 Patient Safety Tip of the Week “[Tracking Technologies](#)”). And we also often see cases where a patient has physically left their inpatient room but there is a delay in notification of the staff to clean the room for the next occupant.

And, in teaching hospitals, we often see teams deferring discharge orders and arrangements until completion of **rounds** rather than addressing those early, taking a break to do the discharge work, then reconvening for complete rounds.

One critical bottleneck we see is in **opening up ICU beds**. Many of the patients with long waits in the ED are awaiting ICU beds. As a hospital medical director, we’d often round with our Director of Nursing in the ICU’s in the morning. We’d routinely find patients who no longer required “intensive care”. Physicians often equate “severity” of a condition with the need for intensive care without consideration of what actual nursing care is needed. For example, a neurologist or neurosurgeon may consider a patient with a subarachnoid hemorrhage to be “critical” because of the potential for deterioration rather than recognizing that the nursing care needs for a stable patient may not be so great.

Similarly, the bottleneck may be in **telemetry units**. In our numerous columns on alarm fatigue, we often recommend hospitals first focus on use of telemetry. Hospitals should have policies that spell out the evidence-based indications for telemetry and make sure that the criteria for stay on a telemetry unit are complied with (both for admission to such units and continued stay on such units).

In addition to focusing on removing the bottlenecks, the most critical element needed is clear-cut **transfer of responsibility and accountability** to the clinical teams (both physician and nursing). While such transfer to the inpatient physician team takes some burden off the ED physician team, there may also be downsides. It is difficult to care for

multiple patients when they are not all clustered or cohorted on one unit, but we've all had to deal from time to time with some of our patients being "boarded" in other sites. Perhaps more important is delineation of nursing responsibility and accountability. Obviously, some of the monitoring of the patient needs to be done by the nurse on location (i.e. the ED nurse). But the ED nurse and the inpatient nurse need to review any admission orders and ensure that there is clarification of who will administer medications, etc.

ED staffing patterns may occasionally contribute to the problem. Most ED's already plan their ER staffing according to expected use, increasing staffing during the times of day when they historically see more patients. But an unexpected surge of patients in the ED may stress the system and lead to longer patient stays in the ED. Trauma centers usually have mechanisms in place to deal with the surge you might see with a multi-casualty event. But a small rural hospital may only have one ED physician working at any time.

And note that long ED wait times may have an impact not just on patients admitted to the hospital but also on patients discharged from the ED. A Canadian study ([Guttman 2011](#)) found that presenting to an emergency department during shifts with longer waiting times, reflected in longer mean length of stay, was associated with a greater risk in the short term of death and admission to hospital in patients who are well enough to leave the department. Patients who leave without being seen were not at higher risk of short-term adverse events. Those authors felt that delays in treatment alone were not likely the cause of the adverse outcomes. Examples they gave of potential contributing factors included reluctance to order time consuming tests or consultations and shortened observation periods (both of which could increase missed diagnoses), incomplete treatment, or inadequate planning and communication of care after discharge. An increased risk of adverse events for low acuity patients in their study suggested that processes might be more likely to break down if patients are thought to be low risk. They point out that patients initially thought to be low acuity can, with careful evaluation, be discovered to have serious illnesses and require hospital admission.

Jones et al. note that several prior studies with limited numbers of patients or hospitals had also shown increased mortality in patients admitted to hospitals after long ED stays. But the Jones study used a database of over 7 million ED visits with matched hospital inpatient admissions. Note that the period of the Jones study was between April 2016 and March 2018, thus prior to the COVID-19 pandemic. It is quite likely that the surge demands on hospitals due to COVID-19 has increased delays in admissions from the ED to an even greater degree. That makes it even more important that hospitals have good systems in place to address the issues raised above.

References:

Jones S, Moulton C, Swift S, et al. Association between delays to patient admission from the emergency department and all-cause 30-day mortality. Emergency Medicine Journal 2022; Published Online First: 18 January 2022

<https://emj.bmj.com/content/early/2022/01/03/ememed-2021-211572>

Guttmann A, Schull MJ, Vermeulen MJ, et al. Association between waiting times and short term mortality and hospital admission after departure from emergency department: population based cohort study from Ontario, Canada. BMJ 2011; 342: d2983

<https://www.bmj.com/content/342/bmj.d2983>



<http://www.patientsafetysolutions.com/>

[Home](#)

[Tip of the Week Archive](#)

[What's New in the Patient Safety World Archive](#)