Improving Patient Flow and Reducing Emergency Department Crowding:

A Guide for Hospitals

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The Need to Address Emergency Department Crowding

Although you, as a hospital or department leader, are responsible for overseeing performance across a number of dimensions, there are several reasons why addressing emergency department (ED) crowding should be at the forefront of your organization's improvement efforts:

1. ED crowding compromises care quality.

2. ED crowding is costly.

3. Hospitals will soon report ED crowding measures to the Centers for Medicare & Medicaid Services (CMS).

4. ED crowding compromises community trust.

5. ED crowding can be mitigated by improving patient flow throughout the hospital.

The purpose of this guide is to present step-by-step instructions for planning and implementing patient flow improvement strategies.

Forming a Patient Flow Team

The importance of creating a patient flow improvement team—and giving careful thought to its composition—cannot be underestimated. Numerous studies have shown the benefits of creating a multidisciplinary team to plan quality improvement interventions. We recommend that, at a minimum, your team include a team leader (i.e., day-to-day leader), senior hospital leader (e.g., chief quality officer), ED physicians and nurses, ED support staff (e.g., clerks, registrars), representatives from inpatient units, and a research/data analyst. It is important to include representatives from all departments that will be affected by your strategy, individuals who will serve as champions for your strategy, and those who may oppose your strategy so that their concerns may be heard.

Measuring ED Performance

Measurement is a fundamental tool to identify and eliminate variation in clinical processes. Data also can be used to show that ED crowding is not just an ED problem, but one that requires hospital-wide solutions. Currently, hospitals are required to report several ED quality measures—for example, the core measures—and new measures are scheduled to start affecting hospital payment in 2013 and beyond (e.g., median time from ED arrival to ED departure). We recommend all hospitals begin collecting data on those measures now.

Identifying Strategies

Selecting the right strategy is paramount for any successful intervention. Hospitals that devote sufficient time up front to careful selection of a strategy often save time in the long run by avoiding having to make major adjustments midstream. We recommend that your team take the following steps before selecting your improvement strategy:

1. Identify the most likely causes of the specific problems you face.

2. Review available materials that describe what other hospitals have done to improve patient flow.

3. Consider your resources.

Preparing to Launch

Once the strategy is selected, we recommend that hospitals create a road map for the implementation process. An implementation plan should be completed by the team and can help:

1. Identify your goals and strategies.

2. Plan your approach.

3. Estimate the time and expenses associated with implementation.

4. Identify performance measures.

Once completed, we recommend that you share your implementation plan with other hospital and department leaders to ensure that they (1) are aware of the efforts underway and (2) understand the timeline, budget, and resources that will be needed.

Facilitating Change, Anticipating Challenges

Facilitating change often involves anticipating common challenges and taking steps to forestall them. We recommend several strategies for addressing those challenges.

Recommended Approaches to Addressing Implementation Challenges

Challenge	Recommended Approach	Rationale
Culture change	Constant reinforcement of the strategy by leaders	Signals to staff that the improvement strategy will become standard procedure
Staff resistance	Staff education	Provides staff with the capabilities and knowledge to carry out the strategy
Staff resistance	Post-implementation adjustments reflecting user recommendations	Signals responsiveness to staff concerns
Staff resistance, culture change, and lack of staffing resources	Use of Lean quality improvement methods	Fosters a team environment
Lack of staffing resources Staff resistance	Robust data collection	Provides concrete evidence of need for action; demonstrates success to hospital leaders and frontline staff; is crucial in securing an executive champion

Sharing Results

Sharing results internally and externally is the key to sustainability and spread. Widely reporting the results of multi-unit and department initiatives helps create a culture of transparency and openness. Units given the opportunity to compare their performance relative to other units will develop a healthy competition to improve. We recommend the use of ED dashboards to provide a snapshot of key process variables of particular interest to internal stakeholders.

Though not all hospitals can participate in a formal collaborative, we recommend that all hospitals build momentum by sharing their results with external stakeholders through community partnerships, written publications, and conference presentations. Some examples of potential outlets for sharing results include: community social service organizations that work with the hospital, other hospitals within a system or in the hospital's metropolitan or State hospital association, local newspapers and blogs, trade publications (e.g., *Hospitals & Health Networks*, *Modern Healthcare*), peer-reviewed journals (e.g., *Joint Commission Journal on Quality and Patient Safety*, *Journal of Emergency Medicine*, *Journal of Emergency Nursing*), and professional societies (e.g., Society for Academic Emergency Medicine, American College of Emergency Physicians, and Emergency Nurses Association).

Section 1. The Need to Address Emergency Department Crowding

Many emergency departments (EDs) across the country are crowded. Nearly half of EDs report operating at or above capacity, and 9 out of 10 hospitals report holding or "boarding" admitted patients in the ED while they await inpatient beds. Because of crowding, approximately 500,000 ambulances are diverted each year away from the closest hospital. ED crowding has been the subject of countless news articles, lawsuits, and research studies.

Although you, the hospital or ED leaders, are responsible for overseeing hospital performance across a number of dimensions, there are several reasons why addressing ED crowding should be at the forefront of your organizations' improvement efforts. These include:

1. ED Crowding Compromises Care Quality

EDs are high-risk, high-stress environments. When capacity is exceeded, there are heightened opportunities for error. The Institute of Medicine's (IOM's) six dimensions of quality (safety, effectiveness, patient-centeredness, efficiency, timeliness, and equity) may all be compromised when patients experience long waits to see a physician, patients are boarded in the ED, or ambulances are diverted away from the hospital closest to the patient. Over the past few years, several studies have presented clear evidence that ED crowding contributes to poor quality care.[1-5]

2. ED Crowding Is Costly

In 2007, the most recent year for which data are available, 1.9 million people—representing 2 percent of all ED visits—left the ED before being seen, typically because of long wait times.[6] These walk-outs represent significant lost revenue for hospitals. The same is true of ambulance diversions. A 2006 study at a large academic medical center (AMC) found that each hour on diversion was associated with $1,086 in foregone hospital revenues.[7] A more recent study conducted at a different AMC showed that a 1-hour reduction in ED boarding time would result in over $9,000 of additional revenue by reducing ambulance diversion and the number of patients who left without being seen.[8] A crowded ED also limits the ability of an institution to accept referrals and increases medicolegal risks.

3. Hospitals Will Soon Report ED Crowding Measures to CMS

The Centers for Medicare & Medicaid Services (CMS) announced the inclusion of five ED crowding-related measures under the Hospital Inpatient Quality Reporting Program[a] initiative:

- Patient median time from ED arrival to ED departure for discharged patients (calendar year [CY] 2013).
- Door-to-diagnostic evaluation by a qualified medical professional (CY 2013).
- Patient left before being seen (CY 2013).
- Median time from ED arrival to ED departure for admitted patients (FY 2014).
- Median time from admit decision time to time of departure for admitted patients (FY 2014).

[a]Hospital Inpatient Quality Reporting Program. Overview available at www.qualitynet.org.
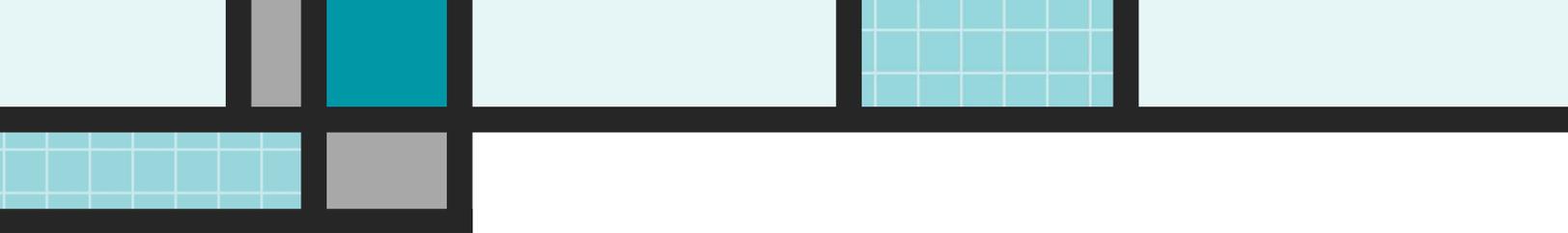
Hospitals will be required to report these measures to CMS in order to receive the full Medicare payment update.[9,10] The measures were endorsed by the National Quality Forum in 2008,[11] and they are commonly used by researchers to assess changes in ED crowding and patient throughput. Eventually, these measures will be reported publicly.

4. ED Crowding Compromises Community Trust

The ED plays a critical role within the community. There is a public expectation that EDs are capable of providing appropriate, timely care 24/7, and that they will have the capacity to protect and care for the public in the event of a disaster or public health emergency. In addition, there is evidence showing that physicians and clinics refer patients to the ED for a variety of reasons,[12] including convenience for after-hours care, reluctance to take on complex cases, liability concerns, and the need for diagnostic testing that cannot be performed in their offices. Because of the high patient volumes that many EDs experience, the ED may be the clinical area that the public is most familiar with, thereby making it the de facto "public face" of the organization. When crowding leads to long wait times and a decreased ability to protect patient privacy and provide patient-centered care, the community's trust and confidence in the organization may be compromised.
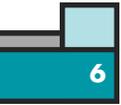
5. ED Crowding Can Be Mitigated by Improving Patient Flow

Over the past several years, much effort has been devoted to investigating the sources of ED crowding and developing potential solutions. Based on that effort, there is widespread agreement that improving the flow of patients in the ED and throughout the hospital holds promise for addressing ED crowding. A number of hospitals have implemented patient flow improvement strategies that have resulted in reductions in measures of ED crowding. As a result, numerous organizations—including the Institute for Healthcare Improvement, the Joint Commission, and the Institute of Medicine—have encouraged hospital leaders to adopt patient flow improvements.[12-14]

The purpose of this guide is to present step-by-step instructions for planning and implementing patient flow improvement strategies. The guide contains real-world examples of how hospitals have implemented these steps, the pitfalls they encountered, and strategies used to overcome them. The guide is intended for a broad audience, including hospital chief executive officers, chief quality officers, risk managers, ED directors, ED clinicians and staff, and others with an interest in reducing ED crowding.

The information in this guide was compiled from the experiences of the hospitals affiliated with Urgent Matters, a national program funded by the Robert Wood Johnson Foundation dedicated to finding, developing, and disseminating strategies to improve patient flow and reduce ED crowding. In 2002, Urgent Matters launched its first learning network with 10 hospitals. The hospitals worked together in a collaborative learning process and received technical assistance to develop and implement best practices to address ED crowding. Results are summarized in the report *Bursting at the Seams: Improving Patient Flow*.[15] In 2008, Urgent Matters launched a second learning network with six hospitals. The second learning network included a formal evaluation of the patient flow improvement strategies, including the facilitators and barriers to implementation, the time and expenses associated with implementation, and the impact of the strategies. Results of that evaluation are summarized in the report *Improving Patient Flow and Reducing ED Crowding: Evaluation of Strategies from the Urgent Matters Learning Network II*.[16]

Section 2. Forming a Patient Flow Team

Numerous research studies have shown the importance of creating multidisciplinary teams to plan quality improvement interventions.[17,18] One of the benefits of a multidisciplinary team is that members will bring different perspectives and knowledge about problems, their underlying causes, and potential solutions. Members may also be able to offer different resources and encourage buy-in for the solutions among their peers. For all these reasons, identifying the right individuals to participate in implementing the patient flow improvement strategies will be central to the success of your effort. Once formed, the team should meet on a regular basis (e.g., weekly) throughout the planning and implementation stages.

Based on the experience of the Urgent Matters Learning Network (UMLN) hospitals, we recommend that, at a minimum, your team include a team leader (day-to-day leader), senior hospital leader (e.g., the chief quality officer), individuals with technical expertise related to the strategy, ED physicians and nurses, ED support staff (e.g., clerks, registrars), a research/data analyst, and representatives from inpatient units.

The experience of the UMLN participants highlighted the important—yet often unrecognized—roles played by registrars, clerks, and technicians, as well as other ED support personnel in the successful adoption of strategies and the need to include these individuals in planning and implementation. In addition, many of the UMLN participants stressed the importance of obtaining the explicit support of the chief executive officer (CEO). The CEO does not necessarily need to serve as your system leader, but a verbal expression of support or approval of resources from the CEO signals to staff that the strategy is important to the organization.

As you assemble your team, we recommend that you consider these questions:

1. Who will lead your team?

The Institute for Healthcare Improvement recommends that quality improvement teams include three types of leaders: a day-to-day leader, a senior hospital leader, and a technical leader.[19] The day-to-day leader is responsible for seeing that tasks are completed on time and motivating the team when challenges are encountered. He or she is also responsible for communicating information about the strategy to the team and to relevant parties outside of the team. This individual will need sufficient time to devote to the improvement strategy. The day-to-day leader should be someone who is able to work effectively with others and someone with sufficient authority to have his or her requests heeded.

Senior hospital leaders are those with sufficient authority within the organization who will be able to assist when barriers arise (e.g., chief nursing officer, chief quality officer). They are able to recognize the implications of the quality improvement effort for the organization and all affected departments. Importantly, the system leader should be someone who can assist with the acquisition of resources to support the strategy, as needed.

A technical leader is someone who will be able to offer technical support or guidance to the team. For example, if your strategy involves changing a form on your electronic medical record, your team will likely need a technical expert from the information technology (IT) department. A technical leader also might be someone who understands processes of care within your organization. For example, a strategy

to improve flow within the fast track might require a fast track nurse who understands the steps that each patient goes through from admission to discharge in the fast track. Teams are likely to require multiple technical leaders, for example, a technical leader for processes of care and a technical expert for data abstraction and analysis.

Example 1. Team Leadership at Hahnemann University Hospital

The patient flow improvement team at Hahnemann University Hospital in Philadelphia, PA, chose to implement the five-level Emergency Severity Index (ESI) triage system as part of their participation in the UMLN II. The ED assistant director assumed the role of team leader (day-to-day leader) and assembled an implementation team that included the hospital's chief nursing officer (senior leader), an ED physician who had experience teaching ESI and implementing it in other organizations (technical leader), a nurse educator, and seven additional ED nurses. Importantly, the nurses selected to participate on the planning team were strategically recruited because of their general openness to change and their leadership among the department's nursing staff. The assistant director felt strongly that it would be easier to communicate and implement ESI to the ED nursing staff if nurses were included in the planning process.

Note: Emergency Severity Index: Version 4. Rockville, MD: Agency for Healthcare Research and Quality; May 2005. Available at http://www.ahrq.gov/research/esi/.

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2. Which departments will be affected by your strategy? Which departments need to participate in order for your strategy to be successful?

ED crowding is a complex, hospital-wide issue. Although some simple ED throughput strategies may affect only ED processes (e.g., implementation of ESI), more complex patient flow strategies are likely to impact, or be impacted by, other departments. In these cases, success will require cooperation from individuals outside the ED. Many of the ED teams that participated in the UMLNs recognized that they could not do it alone; inviting representatives from other departments was critical to the success of the strategies. It is important to include these individuals as early as possible during the planning process. Expanding the number and types of departments represented on the team may provide new ideas and creative suggestions that ED staff alone may not have considered.

Example 2. A Hospital-Wide Strategy at Stony Brook University Medical Center

The patient flow improvement team at Stony Brook University Medical Center in Stony Brook, NY, implemented a strategy to speed specialty consultant requests. The team, which consisted primarily of ED staff, established a specific timeframe within which consulting physicians were expected to respond to the request (within 30 minutes) and complete the consult (within 120 minutes). ED clerks were responsible for tracking response and completion times.

Consulting physicians were not included in the planning process, and many were resistant to the change. However, once the processes began and initial data on response times were available, the patient flow team presented the information to the service department chairs. The chairs recognized that there was room for improvement and communicated to their staffs the importance of meeting the 30- and 120-minute goals.

The patient flow team found the support of the service department chairs to be invaluable. The chairs constantly reinforced to their medical staff that compliance was not optional. One member of the patient flow team noted that it takes a tremendous amount of vigilance on the part of the service department leadership to be sure that people are following the new processes.

3. Who will be a champion for your strategy? Who will oppose it?

Quality improvement efforts require staff commitment and buy-in. Previous quality improvement studies have shown that staff are much more likely to support change if they are involved in developing the solution and have the opportunity to voice their concerns.[17] One of the benefits of taking a team approach to improving patient flow is that the individuals involved in the planning processes can champion the effort to their colleagues. However, it is also important to involve those who might not be supportive of change. These unsupportive individuals may be able to offer ideas to strengthen the improvement strategy so that it may have broader appeal to staff.

Example 3. An Inclusive Approach to Improvement at Westmoreland Hospital

There was general agreement that ED crowding and boarding at Westmoreland Hospital in Greensburg, PA, stemmed from inadequate communication between the inpatient units and the ED, with departments acting in isolation instead of collaboration. However, previous efforts to improve communication between the ED and inpatient units had failed for a number of reasons, including insufficient input from inpatient floors and objections to proposed communication tools.

To overcome these barriers, the team engaged inpatient managers and staff in the early stages of the design of their new communications tool. Managers and staff from all inpatient units were invited to review a new Inpatient Report Tool, a one-page standardized summary and communication fax designed to be sent from the ED to the inpatient floors in advance of the patient's chart arrival. Although inviting the participation of inpatient staff and incorporating their feedback added several weeks to the planning process, it allowed the team to identify potential problems and address them early. For example, nurses in the progressive care, cardiac step-down unit expressed concerns that the tool was not detailed enough for their patients. As a result, the patient flow team worked with the IT department to create an electronic version of the report tool for patients requiring more complex care.

According to the patient flow team, diligent and ongoing communication with nurses from the inpatient units has been instrumental in acceptance and use of the form. Simple solutions and shared responsibility have been crucial to success. Key lessons include:

- The value of engaging inpatient staff at the outset to make them part of the process.
- The importance of inpatient nurse managers taking a leadership role in championing the tool and addressing staff concerns.
- The value of soliciting broad input in promoting buy-in and ownership.

Section 3. Measuring Emergency Department Performance

Variation

The title of this section should really be "managing variation" because variation is at the root of all quality issues. Whether found in a highly mechanical production environment or a consumer-oriented service industry, variation invariably precedes system failure. Hospitals exhibit strong characteristics of both types of industries. This mix of organizational designs presents unique challenges as hospitals attempt to reduce variation in the care they provide. High-reliability production decreases waste and risk exposure, while excellent service results in loyal patients and engaged physicians and nurses.

Measurement is the most fundamental tool in the hospital leader's toolkit to identify and mitigate variation.

Performance Measurement

Performance measurement is simply a step in the feedback mechanism telling a unit (service or production) how it is performing. Hospitals have always been data-driven organizations. Historically, it has been financial processes that have been measured, analyzed, and acted upon. Just as hospitals have collected financial data to give feedback to multiple stakeholders, they now must collect quality data for an expanding number of internal and external stakeholders. The three major foci of measurement are:

■ Regulatory/Accreditation — Examples would include the Center for Medicare & Medicaid Services (CMS) required core measures (e.g., fibrinolytic therapy received within 30 minutes of ED arrival, aspirin at arrival) and documentation of Joint Commission standard achievement.

■ Mission — In addition to financial data, this would include department-specific quality improvement goals identified in a hospital's strategic plans. Another example would be data needed to establish additional credentials (Stroke Certification) or for award applications (Baldrige, American Hospital Association [AHA] NOVA). Hospitals benefit from comparing their performance to similar organizations through participation in benchmarking projects.

■ Rapid Cycle Change — Project-specific data collected during the Plan-Do-Study-Act (PDSA) process to test small-scale process improvements and determine if the change should be accepted, modified, or rejected. Measurement is usually done at the unit level by the same staff delivering the care, and collection is short term in nature. This type of measurement is one of the most effective levers for achieving and sustaining process improvements. More will be said about PDSA in the next section.

Data to Information

Measurement usually begins with a question and quickly moves to data collection. There are three major steps required to collect data that can be used to provide feedback to clinicians and other stakeholders. Each has a unique set of challenges. The first is data generation, which includes all the processes and opportunities clinicians have to enter information into the medical record or management information system. Clinicians need to be aware of the definitions of data elements they are recording and the rationale for collecting the information. Data elements should be easy to document, otherwise clinician cooperation wanes and data accuracy suffers. Periodic surveillance and audits (stratified by provider) will help ensure creation of accurate data.

The second phase is data abstraction. During this phase, data are harvested from the system. This can be a very resource-intensive process, depending on the capabilities of the organization's data system. Over a third of U.S. EDs remain exclusively paper based.[20] Interoperability of computer systems continues to be a challenge for many hospitals. Data elements drawn from billing or coding systems tend to have a consistent location. Data elements reflecting clinical processes may have multiple locations throughout the medical record, thus increasing staff time and training costs for abstraction. Interdepartmental cooperation may be required for successful abstraction, creating workflows that need to be choreographed between busy departments. The final step in the abstraction process should be validation: a systematic, random spot check performed by a second abstractor to ensure the data are accurate.

The third and final phase is data reporting. Key decisions include how much to report and to whom. This is a strategic planning decision that needs to align with the administrative, departmental, and unit goals.

As hospitals move fully into the world of reporting quality data, they are learning that there is a difference between collecting financial data and collecting quality data. Whereas the number of individuals generating, abstracting, reporting, and receiving financial data is fairly limited within the facility, reporting of quality data is a hospital-wide enterprise. Quality issues arise from variation, and no one knows the sources of and solutions to variation better than the front-line staff. Therefore, hospital leaders must establish an expectation that unit and department care teams will identify key process variables, measure them, report the results widely, and improve them as needed. This may require structure and culture modifications along the power/authority continuum (Figure 1). To manage the current complexity and future uncertainty of modern health care, quality improvement is no longer just a department, it must be a way of thinking and behaving.

Figure 1. Power/authority continuum

Centralization vs. Decentralization

Regulatory/Accreditation   Mission Driven   Rapid Cycle Change

Pending Measures

Multiple measures are already in place affecting the ED, and new measures are scheduled to start affecting hospital payment in 2012 and beyond (Figure 2). These measures will ultimately end up on Medicare's Hospital Compare Web site,[b] as have the core measures.

Figure 2. Pending emergency department measures

Measure Name	Effective Date
Use of Brain Computed Tomography (CT) in the Emergency Department (ED) for Atraumatic Headache	2012
Head CT Scan Results for Acute Ischemic Stroke or Hemorrhagic Stroke Patients Who Received Head CT Scan Interpretation Within 45 minutes of Arrival	2013
Troponin Results for ED Acute Myocardial Infarction (AMI) Patients or Chest Pain Patients (with Probable Cardiac Chest Pain) Received Within 60 minutes of Arrival	2013
Median Time to Pain Management for Long Bone Fracture	2013
Patient Left Before Being Seen	2013
Door to Diagnostic Evaluation by a Qualified Medical Professional	2013
Median Time from ED Arrival to ED Departure for Discharged ED Patients	2013
Median Time from ED Arrival to ED Departure for Admitted ED Patients	2014
Admit Decision Time to ED Departure Time for Admitted Patients	2014

Previous CMS ED measures related primarily to clinical processes (fibrinolytic therapy received within 30 minutes of ED arrival and median time to ECG). Pending measures continue to focus on clinical processes (time to pain management and troponin results). But CMS has signaled a willingness to look more globally at ED processes by including the throughput measures (arrival to departure for admitted and discharged patients, decision to admit, door-to-diagnostic evaluation, and left before being seen). CMS has fended off criticism of these "nonclinical" measures by stating that despite their lack of focus on a specific clinical issue, they capture the totality of the ED experience, which frequently includes collaboration and coordination between many departments throughout the hospital. This rationale was supported by the results of a first-of-its-kind field test of the ED throughput measures.[21] For 12 months, the UMLN II hospitals collected and reported monthly on the "arrival to departure for admitted and discharged patients" and the "decision to admit" measures. The hospital staff members were then interviewed to better understand the benefits and burdens of collecting and reporting the measures.

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[b]Centers for Medicare & Medicaid Services. Hospital Compare Web site. Available at http;//hospitalcompare.hhs.gov. Accessed September 8, 2011.

Staff reported that the measures were initially difficult to collect, but the learning curve quickly flattened. The need to access multiple IT systems was the challenge most frequently identified. Staff did not anticipate a need to hire additional staff when the measures became permanent, nor was additional training required to abstract the measures. One staff member needed "a 5-minute phone call" to learn how to access the nursing documentation system. Staff overwhelmingly voiced support for the measures. An ED medical director said the throughput measures were like "barometers" because they gave a global view of ED performance, while other, narrower measures, such as Door to Doctor, were "yardsticks" yielding more specific information.

An ED nurse recalled how his facility chose the throughput target of 150 minutes for discharged patients: "We saw that our patients are grumpy after 150 minutes…that's how we picked the 150 minutes….But that's not really the best way to pick." Several staff reported that having and sharing the data gave them "greater legitimacy" when dealing with other departments and helped create a "culture of continuous quality improvement within the ED." Most importantly, staff used this information to support their position that ED crowding requires hospital-wide solutions and that it is not just an ED problem.

Section 4. Identifying Strategies

Once a hospital has formed a patient flow improvement team (Section 2) and is collecting performance data (Section 3), the next step is to identify a strategy or strategies to reduce ED crowding and improve patient flow. Selecting the right strategy is paramount for any successful intervention. Hospitals that devote enough time up front to careful strategy selection often save time in the long run by avoiding the need to perform major adjustments midstream. This section is designed to walk you through the processes of selecting a strategy.

1. Identify the Most Likely Causes of the Specific Problems You Face

Members of your patient flow improvement team should be able to identify possible roadblocks to patient flow in the ED and the hospital. Is the lab turnaround time contributing to long patient lengths of stay in the ED? Do patients typically wait for hours for a physician specialist consult? Performance improvement methodologies (e.g., Lean, Six Sigma) and related tools (e.g., process mapping) can be used to identify specific causes of blockages, as well. Roadblocks also may be identified through a review of data from your hospital. Identifying the major roadblocks to flow should guide your team in focusing your improvement efforts.

Example 4. Good Samaritan Hospital: Using Data to Aid Strategy Selection

Good Samaritan Hospital in Long Island, NY, had a rate of left-without-being-seen (LWBS) patients that was close to the national average of 2 percent. After reviewing its data, ED leaders found that 87 percent of LWBS patients were triaged as Emergency Severity Index (ESI) Level 3, and the highest LWBS rates occurred among a subset of ESI 3 patients presenting with one of the following six chief complaints: abdominal pain, flank pain, headache, pregnancy complication, vaginal bleeding, or vomiting. The average LWBS rate among that group was 12.5 percent. Further, this subset of ESI 3 patients had an average length of stay of 426 minutes, compared with an average of 294 minutes for all ED patients.

In addition to having the highest LWBS rates, this subset also had the longest physician wait times—the median time was 78 minutes, compared with 48 minutes for all ESI 3 patients. Part of the reason for these higher LWBS rates and longer waits was that these patients fell in the middle: they had complaints too complex for fast track yet not serious enough for direct admission to the ED. However, the potential for these conditions to become life threatening while the patient waits to be seen is a major patient-safety and quality-of-care concern.

To address this identified problem, Good Samaritan implemented a strategy to immediately direct a subset of ESI 3 patients to a dedicated physician and nurse practitioner. Following a physician evaluation in triage, patients are received by a nurse practitioner who coordinates their care with the triage physician.

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2. Explore What Other Hospitals Have Done to Improve Patient Flow

Numerous resources are available online that describe actions taken by hospitals that have been successful in improving patient flow (see Appendix A). These resources should help your team generate ideas for possible strategies.

3. Consider Your Resources

Your team needs to set realistic expectations for your strategy. How ambitious can it be and still be successful? A lack of human and financial (e.g., capital, educational) resources is often a barrier that eliminates many otherwise attractive strategies from consideration. For example, hospitals with access to additional staffing or full-time equivalents (FTEs) may be able to adopt strategies that add new roles. Hospitals with access to educational funds may be able to adopt strategies that are facilitated by current staff with enhanced skills.

The likely need for additional resources points to the importance of securing leadership support — perhaps the most precious resource of all. Without an administrative champion, it can be extremely difficult to secure needed funding. Hospital leaders may be willing to provide funding support for your efforts if you can make the case that your strategy will lead to an increase in patient revenue through a reduction in the number of patients who leave without being seen and/or in ambulance diversion hours.

In addition, leadership support makes it more feasible to consider changes that impact units and staff outside the ED. If you do not have committed leadership support, your team would do best to restrict its focus to process changes within the ED, since these generally require few, if any, additional funds, and they do not require coordination with, or cooperation from, non-ED staff.

Example 5. St. Francis Hospital: Educational Resources Needed for Ambitious Strategy

St. Francis Hospital in Indianapolis, IN, realized that because of strong departmental nursing leadership and some successes with Lean Six Sigma projects, front-end improvements were attainable. At the hospital's south campus in January 2009, ED leadership selected the combined strategies of quick registration and rapid triage as projects to be implemented through the Urgent Matters Learning Network.

In late spring of 2009, two nursing educators formed an education subcommittee that was responsible for developing an educational plan for the process changes. This plan included presentations at staff meetings, one-on-one education, online training, huddles, emails, and educational folders. During staff meetings in August and September 2009, presentations included an overview of the educational folders, an update on staff education (75 percent of all nurses attended at least one educational session), and a review of the new triage process.

Concurrently, a significant number of nurses were trained in a standardized triage methodology. The ED director had previously been trained in this methodology, and another nurse leader was sent for train-the-trainer training in early 2009. These two trainers then trained ED staff nurses. Most RNs completed the 2-day training and passed the certification exam by the end of 2010. This new in-house training standardized the mechanical and cognitive concepts of the triage process and included both rapid and comprehensive triage training. The training costs were $7,000 for an additional in-house trainer and $80 for each nurse who received on-site training from a certified staff trainer.

4. Choose Your Strategy

Through UMLN II, we discovered that there are several processes hospitals can use to select a strategy, ranging from one person selecting the strategy to a large staff-level performance improvement team brainstorming various strategies, testing them (e.g., through kaizen events [i.e., a continuous quality improvement process] or rapid cycle change), and finally coming to a decision. In general, the selection process usually fits into one of two broad categories:

1. Top-down strategy selection.
2. Bottom-up strategy selection.

UMLN II hospitals were divided in the approach they used, with some hospitals primarily using a top-down approach to strategy selection and others using a more bottom-up approach. Top-down selection normally includes the ED leadership team (in one case through a vote of senior leaders), although it can also include hospital leadership. Bottom-up selection often occurs at hospitals that use performance improvement methodologies, such as Lean, that emphasize bottom-up improvement.

> ### Example 6. Thomas Jefferson Hospital: Selecting a Strategy Through the Ballot Box
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> ED staff from Thomas Jefferson Hospital in Philadelphia, PA, reviewed the UMLN II toolkit, printed all the strategies from the toolkit, and distributed them to the ED leadership group. Members of the leadership team voted anonymously from among the 49 listed strategies. Based on the vote, three strategies were identified for further consideration. One strategy was eliminated because the hospital already had a program in place to address the particular problem. A second was eliminated because the leadership team determined that implementation of the strategy was partially out of its control. The remaining strategy was improving the fast track, which became the focus of the hospital's improvement team.

Section 5. Preparing to Launch

Once the strategy is selected, you will need a road map for the implementation process. An implementation plan (IP) should be completed by the team to document the goals, resources, budget, and performance measures. An IP template can be found in Appendix B. The IP comprises four steps, each of which is described more fully below:

1. Identify goals and strategies.
2. Plan the approach.
3. Estimate the time and expenses associated with implementation.
4. Identify performance measures.

Once completed, we recommend sharing the IP with hospital and department leaders to ensure that they are aware of the effort underway and understand the timeline, budget, and resources that will be needed for the effort. You may need to update the IP periodically as new team members are added or new resources are identified. Still, the original IP should be maintained so that your team can periodically check progress against the initial budget and timeline.

This section provides instructions on completing the IP. Appendix C presents an example of a completed IP.

Step 1. Identify Goals and Strategies

In this first section of the IP, your team will develop the problem statement. The problem statement should briefly describe the current practice that needs to be changed and how it adversely impacts patient flow. To the extent possible, the problem statement should contain measures of the problem. For example, "The department currently does not use a valid and reliable triage system, and 10 percent of patients triaged to fast track are later determined to require a higher level of care" or "Due to a lack of inpatient capacity, the ED holds admitted patients for an average of 10 hours."

Next, your team should develop a brief goal statement. The goal statement should clearly identify the process that will be improved and include a measure that can be used to assess whether the strategy is successful. For example, "Specialty physician service consultations will be initiated within 30 minutes of request. The modified consult request process will reduce length of stay by 25 percent for patients requiring consultations." The goal should be relevant to patient flow, attainable, and measurable. For example, "reducing lab turnaround times by 50 percent" should only be selected as a goal if your team has access to data on lab turnaround times.

Finally, the strategy description should provide an overview of the process to be changed. Your strategy description should contain sufficient detail and be written in plain language so that it is easily understood by individuals in various departments and those with nonclinical backgrounds.

Step 2. Plan the Approach

The next section of the implementation plan focuses on outlining how the changes will be made and who is responsible.

■ First, compile a list of all project team members, along with their titles and departments.

■ Second, the team should identify potential barriers to successful implementation. Consider issues related to current processes, organizational culture, or other issues that might delay or derail implementation. We recommend reviewing the information in the next section of this guide (Facilitating Change, Anticipating Challenges) for more information on common barriers that patient flow teams have encountered during implementation. Identifying potential barriers to the implementation of your improvement strategy up front is important because efforts to mitigate those barriers can then be included in your work plan and timeline. It will also help to consider whether other individuals should be included in the team or other resources might be needed.

■ Third, choose a formal method for improvement. We recommend that you use the Plan-Do-Study-Act (PDSA) process, which has been used extensively in the health care field. PDSA is an iterative cycle in which organizations conduct planning for the change (Plan); carry out a small-scale test of the planned change (Do); collect and analyze data on the impact of the change, identify issues or problems, and learn from the consequences (Study); and determine what modifications should be made to the change and whether to proceed to full-scale implementation (Act). The repetition of the PDSA cycle will help your team determine what works and what does not, as well as what should be kept and what should be modified. The change is repeatedly refined until it is ready for broader implementation.

Testing changes on a small scale (e.g., during a single shift) has several advantages. First, it can be accomplished quickly with a minimal expenditure of resources and provide an indication of what to expect from full-scale implementation. Second, staff may be more willing to test a change if they understand that the change will be modified as needed.

Still, there are several other quality improvement approaches to use, such as Lean or Six Sigma, and many of these popular quality improvement approaches employ similar techniques. Appendix D contains information on where to find more information on these approaches.

■ Fourth, identify the implementation steps. This section of the IP should be a comprehensive work plan that includes the milestones or "gates" that must be accomplished in order for the strategy to be implemented. Each step should identify the PDSA tests of change that will inform progress to the next gate. The multiple iterations of PDSA may reveal additional milestones that are needed, and the timeline should change accordingly. The implementation steps are the heart of the IP and will reflect the dynamic nature of quality improvement in the complex hospital setting.

Along with each step, your team should identify who is responsible for the task and when the task should be completed. To draft this section of the IP, consider the following questions:

– What data need to be collected?

– Do staff members need to be trained?

– Do forms (electronic/paper) need to be developed?

– Do purchases need to be made?

Example 7. Lean as a Method of Improvement

In 2008, Thomas Jefferson University Hospital in Philadelphia, PA, hired a new chief operating officer who saw a need to provide Jefferson staff with resources to improve performance. He arranged for General Electric (GE) to teach 45 employees the methods of Lean and Six Sigma. These 45 facilitators were made available to departments to lead Lean-driven improvements. The patient flow improvement team at Jefferson then used Lean methods to improve flow in the ED's fast track.

The Lean-trained facilitators, who were part of the patient flow improvement team, began by conducting interviews with fast track and ED staff. They observed work processes in the ED and documented how long it took to complete various tasks. Through this process, the facilitators discovered that the fast track nurse practitioner (NP) spent less than 40 percent of her time on NP tasks, and the nurse spent less than 6 percent of his or her time on nursing tasks. They also discovered sources of waste. For example, nurses spent a lot of time searching for equipment and supplies.

Next, the patient flow team participated in a 3-1/2-day kaizen (i.e., continuous quality improvement) event. The team spent the first 2 days observing and creating a value stream map of all tasks that occur between patients' arrival and discharge from the fast track. After identifying value- and non-value-added tasks, the team determined that the fast track could meet a goal of a 90-minute turnaround time for patients by making the following changes:

- Dedicating a nurse practitioner, nurse, and technician to staff the fast track and remain there even when the main ED was crowded.
- Posting a welcome sign in the doorway directing patients to the registration window.
- Having a technician serve as a patient greeter to identify obvious fast track patients in the waiting room and direct them immediately to the fast track.
- Enabling all fast track computers to print discharge instructions.
- Educating the nursing staff on Emergency Severity Index (ESI) triage procedures so that mid-acuity patients could be better identified and sent to the main ED.
- Continuously stocking supplies and equipment.
- Relocating the fast track close to the front of the ED.

During the last day-and-a-half of the kaizen, the team implemented the changes listed above (with the exception of changing the fast track location) as a test run. There was a lot of enthusiasm among the kaizen team members, fast track staff, and ED leadership about the changes identified; however, more work was needed to sustain the changes. The team had several followup tasks, including ordering a permanent welcome sign for the waiting room; planning ESI education and competency assessment for triage nurses; developing written guidance about the roles of the NP, nurse, and technician in fast track; and cleaning and organizing the fast track supply cart. The team met weekly for 1 month after the kaizen event to discuss progress on these followup tasks, as well as any other issues associated with the implementation and maintenance of the changes. After the month, followup tasks were completed, and responsibility for the maintenance of improvements and analysis of data was turned over to the director of strategic initiatives.

- Finally, your team should consider a communications strategy. The patient flow team should meet periodically, information about the PDSA cycles and full-scale implementation should be communicated to staff, and progress should be communicated periodically to hospital and department leaders. This component of the IP requires your team to think about each of these issues, identify who is responsible for communication, and create the timeline for communication.

Step 3. Estimate the Time and Expenses Associated with Implementation

This section of the IP is focused on planning for the resources needed to get your patient flow improvement strategies implemented.

Your team should estimate the total number of hours that will be spent planning and implementing your strategy. We recommend developing estimates for each staff member so that expectations are established up front about the commitment of time needed to support the effort.

The amount of time that team members will spend on the effort will vary considerably, based on the strategy and individual staff member roles. During the UMLN II, the total time spent planning and implementing the strategies ranged from 40 to 1,017 staff hours per strategy. The most time-consuming strategies were those that involved extensive staff training, large implementation teams, or complex process changes. ED nurse managers, charge nurses, and staff nurses spent more time planning and implementing strategies than others, primarily because several of the strategies involved extensive nurse training.

Though it may be tempting to form small teams or minimize staff training in an effort to reduce total planning hours, dedicating ample time to these tasks up front may reduce miscommunication and/or the need for more retraining later on. Several members of the hospital patient flow improvement teams noted, in retrospect, that they wished they had devoted more hours to planning in order to smooth the implementation process. Others said that they would have included other individuals on the implementation team earlier in the process in order to reduce staff resistance later.

Example 8. Hours Spent Planning and Implementing Strategies

Large training effort. To implement the five-level ESI triage system at Hahnemann University Hospital, a committee of nine nurses spent 92 hours each (828 total hours) planning the transition and developing the first training seminar. An additional 160 hours (4 hours each for 40 nurses) were spent on the initial training of staff nurses. After ESI was fully implemented, nurse leaders devoted additional time auditing cases and conducting a second training seminar.

Large vs. small teams. Hahnemann University Hospital and Thomas Jefferson University Hospital both implemented strategies to improve patient flow in their fast tracks and established dedicated fast-track teams. Hahnemann used a top-down approach, with planning conducted by the ED director and assistant director, so the number of individuals involved in planning and implementing the strategy was limited. Since the strategy at Hahnemann largely involved the acquisition of new resources (e.g., hiring new staff, overseeing a construction project), it was amenable to a top-down approach. Conversely, Thomas Jefferson used a Lean approach, which involved participation from multiple team members. The team was charged with identifying the reforms to the fast track that would improve patient flow, and multidisciplinary viewpoints were needed. The team consisted of three physicians, two nurses, two nurse practitioners, a technician, a registration manager, and three quality improvement facilitators. As a result, total planning and implementation time was considerably higher at Thomas Jefferson than at Hahnemann (371 hours vs. 160 hours, respectively).

High vs. low complexity. The strategy that was least time-consuming to plan and implement was bedside registration, which was implemented at Hahnemann. The strategy was planned by the ED director, assistant director, and nurse educator, who simply announced the policy change during staff meetings. It was a relatively straightforward change in protocol that did not require staff training or a large number of planning meetings. In all, 40 hours were spent planning and implementing the strategy. Conversely, development of a new protocol for requesting physician specialist consultations at Stony Brook was a relatively complex strategy that involved gathering data to study the problem, developing a new system for tracking consults, and educating clerks and physicians on the process. That strategy required 256 total hours.

Next, your team should estimate expenditures. What purchases need to be made? Should additional staff be hired? Like time estimates, expenditures will vary based on the strategy selected. Of the eight strategies adopted during UMLN II, five required little or no new expenditures. Many of these interventions involved a simple process change, a change in policy, or a shift in staff responsibilities, rather than the addition of new staff or equipment. Only three strategies involved sizable expenditures, ranging from $32,850 to $490,000. Construction and the addition of new personnel represented the most costly expenditures.

We recommend that you list all resources needed for implementation, including those that do not require expenditures. For example, if a new chair is needed for fast track, and you plan to use a chair from another area or department, list the chair as a needed resource in the IP so that your team and others are aware of the need to pull the chair from another location.

Example 9. Expenditures on Patient Flow Improvement Strategies

Small expenditures. Westmoreland Hospital, in Greensburg, PA, focused its efforts on improving communication between the ED and inpatient units in an effort to expedite admissions. The team developed a communication tool to enhance the way that information is shared between the units. Their strategy requires the ED nurse to fax a one-page form to the inpatient unit within 20 minutes of the ED admission order. The fax provides a concise description of the patient's current condition and recommended care path. The only purchase was a $200 fax machine.

Moderate expenditures. The patient flow improvement team from St. Francis Hospital in Indiana developed a strategy to standardize the registration and triage process. The hospital adopted a zoning strategy for registration (i.e., assignment of one registrar to a set of geographically close rooms), which required the addition of two computers on wheels ($8,000 each). Also, two nurses attended a train-the-trainer triage course ($16,850).

Large expenditures. For mid-track at Good Samaritan Hospital Medical Center, one ED physician was hired ($267,293) to provide triage and initial treatment to a subset of mid-acuity patients in a renovated triage room ($8,000). This enabled this category of patients, who traditionally wait the longest and have the highest rate of leaving before being seen, to be evaluated by a physician much faster. A tech was also hired ($33,390) to escort these patients to a separate area where a nurse practitioner could continue treatment under the guidance of the ED physician. An obstetrics chair was purchased ($12,000) for this separate area.

Next, list all approvals that will be needed prior to implementation. Who needs to approve the strategy and relevant components of the implementation plan? Think about approvals needed from various levels including hospital leadership, ED leaders, and staff supervisors.

Step 4. Identify Performance Measures

The final section of the IP is designed to help measure progress. First, consider the performance measures that will be affected by your strategy. Several suggested performance measures are included in the IP template (e.g., ED arrival to ED departure), but organizations with sophisticated data collection systems may have access to others. We recommend that you select multiple performance measures, as they measure different aspects of patient flow. Be sure to check whether you have access to the measures from your information system.

Additional resources may be needed for data collection (e.g., computers, software, staff time). Remember to list these resources in Section 3 of the IP. Similarly, consider whether you need permission to gain access to the data, and list those approvals in Section 3.

Section 6. Facilitating Change and Anticipating Challenges

This section describes common facilitators for the implementation of ED improvement strategies, as identified from the experiences of the hospitals participating in UMLN II. In some instances, facilitating change involved anticipating challenges and taking steps to forestall them.

Securing a Champion

As was noted earlier, the importance of securing leadership support in facilitating the implementation of improvement strategies cannot be overstated. This is especially the case for many strategies requiring additional resources or potentially impacting units outside the ED. Several of the UMLN II strategies required hiring additional personnel, and some of the hospitals struggled with recruitment and hiring freezes. Due to the economic recession and overall financial pressures, hiring additional staff was not an option for some hospitals that did not have an executive champion.

Example 10. St. Francis Hospital: Securing a Champion

St. Francis Hospital in Indianapolis, IN, focused on front-end improvement strategies. One of the strategies employed by St. Francis was registration zoning, which assigns a staff member to fully register patients in a specific "zone" of rooms using workstations on wheels (WOWs). Initially, hospital leadership refused to approve the purchase of WOWs because funds were limited, and the entire health system was moving toward standardized mobile units. With the support of the director of business transformation, the chief operating officer became a champion for the project. These two leaders eventually succeeded in lobbying for the purchase of two WOWs. Since the WOWs were not in place until February 2010, progress was held back during the early phases of the collaborative.

Creating Structure and Accountability

The UMLN II provided the hospitals with structure, a firm timeline for implementation, and the external accountability needed to ensure that the proposed improvement strategies received appropriate attention among many competing priorities. As a condition of participation, hospitals were required to provide UM staff with detailed implementation plans, which meant that the teams had to consider all of the intermediate steps needed to implement their strategy, the resources required, and the individuals who should be involved. In addition, the external accountability created by UM helped to ensure that the proposed improvement strategies received appropriate attention despite other large projects underway during the same time period (e.g., large hospital construction projects, the implementation of electronic medical records).

While most hospitals will not be able to participate in a formal collaborative, developing informal partnerships and collaboration may provide similar opportunities for shared learning, as well as some degree of accountability associated with promises to report progress or share data. In addition, the experience of the UM participants points to the value of formally using the IP template—even in the absence of collaborative participation—in providing a structure for planning and implementing change.
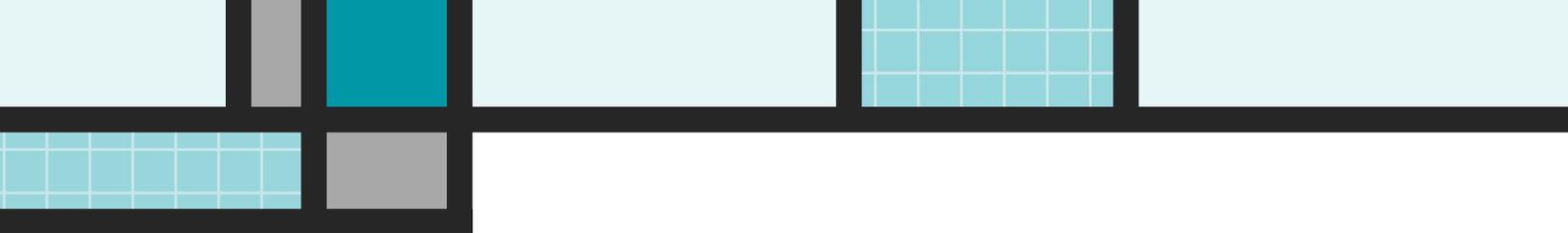
Aligning the Reporting Structure

Having a supportive supervisor and/or senior leader who oversees multiple units or staff likely to be impacted by the changes can significantly improve the chances for much-needed coordination, cooperation, collaboration, and compliance. An aligned reporting structure was critical to the success of strategies at several of our UMLN II hospitals where multiple hospital units and/or staff with different roles were involved.

At one UMLN II hospital, the chief operating officer established a new position—vice president for emergency medicine for clinical operations—responsible for overseeing all ED operations. This change was significant because for the first time, all ED physicians and nurses reported to the same individual. The new vice president was a proponent of patient flow improvement, and staff understood that improving the fast track was a priority for the department.

Adopting Staff-Driven Strategies

Engaging diverse staff throughout the planning, design, and implementation of patient flow improvement strategies is critical to facilitating successful and lasting change. Engaging staff likely to be impacted by the changes can provide valuable perspectives, knowledge, understanding, and expertise while reducing the likelihood of encountering staff resistance later.

Lean process improvement methods may be especially useful in engaging staff, as was demonstrated at two UMLN II hospitals. Both hospitals formed multidisciplinary teams to map current processes, identify changes that would improve efficiency, test the changes over a short time period, and make adjustments until the goal was met. At one participating hospital, respondents reported that Lean tools resulted in a better understanding among nurses as to why the changes were being made.

Careful selection of capable, adaptable, and willing staff to pilot the changes is also important. The planners at two participating hospitals knew that the strategies would not initially be embraced by all staff members, and they selected individuals who would put significant effort toward testing the process change. These employees became staff-level champions for the strategies and helped convince others of the strategies' merits.

Engaging in Robust Data Collection

Robust data collection can help performance improvement teams obtain needed resources and address staff resistance. For example, capturing data to illustrate the problem of crowding was crucial in recruiting an administrative champion needed to secure essential resources at one UMLN II hospital. Data also can be used to prove to leaders that ED overcrowding is a hospital-wide issue rather than just an ED issue, potentially increasing the likelihood they will support the strategies. Finally, data can be used to feed information back to staff, so that they can see the impact of their work.

Realistically Appraising the Need for Resources

Being realistic is a key to success. Hospital teams should ensure that they have the resources they need and that their strategies are compliant with national, State, and local regulations. Success should not be predicated on pulling resources from elsewhere. At one hospital, it was clear to the team that a dedicated nurse and technician were needed to assist the NP in fast track. One respondent said, "We asked the administration for an additional tech, but I can tell you they said 'no.'" An ED nurse and tech were pulled from the ED to staff fast track, though as one respondent put it, "We robbed Peter to pay Paul." A respondent from another hospital indicated that one of the lessons learned was that there "needs to be dedicated personnel, and the strategy cannot be predicated on pulling people from the main ED."

Anticipating and Addressing Staff Resistance and Culture Change Through Education

More often than not, some level of staff resistance will be encountered, typically because of increased workloads or disruption of familiar staff workflow patterns. In UMLN II, some proposed strategies ran counter to the culture of the department, and many of the patient flow improvement teams found it difficult to change attitudes and habits. Previous failures to implement or maintain quality improvement efforts led to cynicism among some staff members. Culture trumps strategy, and as one respondent put it, "You have to change how people think."

There were a couple of approaches that the patient flow improvement teams in UMLN II hospitals used to successfully overcome staff resistance and facilitate culture change (Figure 3). The first is staff education and reeducation. As one staff educator put it, "there can never be enough education." Improvement team members from several hospitals said that more time should have been allocated to staff training. For example, reflecting on the implementation of the strategy at Good Samaritan, one staff member said, "Whenever you start a new process, you always find that the time you've allocated for education is never enough, and that the education component takes more effort and more time than anticipated." Team members from Stony Brook University Medical Center, who implemented a new process for requesting specialty consultations, speculated that additional training might have reduced some of the miscommunication about the new process and saved time in the long run.

Another important factor in addressing staff resistance is leadership that is completely transparent with data, sending clear and positive messages to staff and providing constant reinforcement to staff about the importance of following new processes.

Example 11. Overcoming Staff Resistance and Culture Change at Hahnemann University Hospital

As part of its participation in UMLN II, Hahnemann implemented an open-bed policy, where patients are directed to an open bed as soon as it becomes available for triage and registration. The traditional protocol at Hahnemann had been to triage and register patients when they arrived in the ED and have them sit in the waiting room until a nurse was ready to see them. Patients waited hours, even if a bed was empty, because nurses thought that they had too many patients to care for and were overwhelmed at taking on more patients. The open-bed policy was designed to reduce the bottleneck of patients in the waiting room, getting them into a bed sooner. Additionally, it reduced the likelihood of patients leaving the ED if they were already in a bed.

The implementation of the open-bed policy occurred gradually. The ED director stressed the importance of the open-bed policy at all staff meetings, but there was resistance by staff. Nurses focused on the number of patients that they were responsible for, regardless of the intensity of time that patients required. The nurses were overwhelmed when they had responsibility for more than four or five patients, even if some of the patients were simply waiting for laboratory results.

In addition, many staff members were skeptical about the implementation of the open-bed policy because of failures by previous department leaders to sustain change. This situation resulted in staff being skeptical that the ED leaders were serious about making it a permanent part of operations. It was initially treated as a "flavor of the month," where operations would be modified for a while but would slowly revert back to the old method.

One factor that helped foster acceptance of the open-bed policy among staff nurses was that the triage or charge nurses would often begin patient work-ups when they brought a new patient to an open bed, relieving the staff nurse from the responsibility. Further, in 2008 the department experienced considerable turnover, resulting in a need to hire 30 new nurses. Department leaders and nurses reported that it was easier for the new nurses to adapt to the process changes because they were not as familiar with previous processes. The open-bed policy gradually gained acceptance during the day shift. It is the hope of ED leadership that the night shift will soon follow in acceptance.

In addition, to sustain the changes, there were constant reminders by the department leaders about the importance of the changes. The presence of outside technical advisors and evaluators under the UM collaborative also conveyed a message to staff that these changes were different and would be sustained.

Post-Implementation Adjustments

Several UMLN II strategies required constant tweaking and readjustment. For an inpatient report tool strategy, one implementation team made changes to address the concerns of staff from a cardiac unit. They worked with the IT department to create an electronic version of the tool with more detailed information for complex patients. It is important for leaders to be transparent with performance improvement data and encourage continuing, two-way communication. At one hospital, staff support for the improvement strategy lagged because management did not share up-to-date data with staff.

Figure 3. Recommended approaches to addressing implementation challenges

Challenges Addressed	Approach	Rationale
Culture change	Constant reinforcement of the strategy by leaders	Signals to staff that the improvement strategy will become standard procedure
Staff resistance	Staff education	Provides staff with the capabilities and knowledge to carry out the strategy
Staff resistance	Post-implementation adjustments	Signals responsiveness to staff concerns
Staff resistance Culture change Lack of staffing resources	Use of Lean quality improvement methods	Fosters a team environment
Lack of staffing resources Staff resistance	Robust data collection	Provides concrete evidence of need for action; demonstrates success to hospital leaders and front-line staff; is crucial in securing executive champion

Section 7. Sharing Results

Internally

Reporting about performance improvement projects and results widely throughout the affected departments closes the feedback loop and reinforces the need for ongoing quality improvement efforts (Figure 4). Success breeds success, and as front-line staff grow to appreciate their ability to effect and sustain improvements, they will want to do more. Widely reporting the results of multiunit or multidepartment initiatives helps create a culture of transparency and openness. Units given the opportunity to compare their performance relative to other units will develop a healthy competition to improve. The use of ED dashboards provides a snapshot of key process variables of particular interest to stakeholders.

Figure 4. Data reporting practices at six UMLN II hospitals

Data routinely sent to:	Number of hospitals reporting:
Hospital board of directors	3
Other departments	3
C-suite (Top leadership)	5
Director of quality	5
ED leadership	6
ED staff	6

Externally

As mentioned earlier in this guide, the UMLN II evaluation found that a common facilitator to improvement was the internal accountability and momentum created through participation in a collaborative. While not all hospitals can participate in a formal collaborative, they can build momentum by sharing their results with external stakeholders through community partnerships, written publications, and conference presentations. Some examples include community social service organizations that work with the hospital, other hospitals within a system or in the hospital's metropolitan or State hospital association, local newspapers and blogs, trade publications (e.g., *Hospitals & Health Networks, Modern Healthcare*), peer-reviewed journals (e.g., *Joint Commission Journal on Quality and Patient Safety, Journal of Emergency Medicine, Journal of Emergency Nursing*), and professional societies (e.g., Society for Academic Emergency Medicine, American College of Emergency Physicians, and Emergency Nurses Association).

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Appendix A. Guide to Online Resources Successfully Used by Hospitals to Improve Patient Flow

■ **The Urgent Matters Toolkit**
This toolkit includes over 50 examples of proven strategies to reduce ED crowding and improve patient flow. Each example includes the strategy, result, hospital demographics, type of staff involved, clinical areas affected, timeline, implementation experience, lessons learned, and cost/benefit estimate. Available at http://urgentmatters.org/toolkit.

■ **American Hospital Association (AHA) Hospitals in Pursuit of Excellence**
This Web site includes more than 25 case studies that focus on improvements in ED throughput. These case studies focus on the problem, solution, results, background, impact on patient flow, resources expended, sustainability, patient and staff perceptions, and how the strategy meets the Institute of Medicine's six aims. Available at http://www.hpoe.org/.

■ **Agency for Healthcare Research and Quality (AHRQ) Innovations Exchange**
The Innovations Exchange includes over 75 examples of innovations to improve ED patient flow and reduce crowding. Each innovation includes the what, how, outcomes, and special considerations relative to adoption. Available at http://www.innovations.ahrq.gov/.

■ **Institute for Healthcare Improvement (IHI)**
IHI features four ED improvement stories and eight emerging content resources focusing on the following categories: how to improve, measures, changes, and literature. In addition, its Web site features several ED patient flow improvement tools, such as an ED hourly patient flow analysis tool. Available at http://www.ihi.org.

■ **Emergency Nurses Association (ENA)**
ENA's Successful Solutions to Crowding Web site includes eight strategies that led to successful solutions. The solutions are listed under four major areas: access, throughput, ancillary, and disposition. Available at http://www.ena.org.

■ **American College of Emergency Physicians (ACEP)**
ACEP's Emergency Medicine Crowding and Boarding resources provide information, resources, and examples for a variety of approaches to assist emergency physicians in addressing ED crowding problems by working with hospital administrators, local stakeholders, policymakers, and the public. The members-only section includes crowding case studies. Available at http://www.acep.org/.
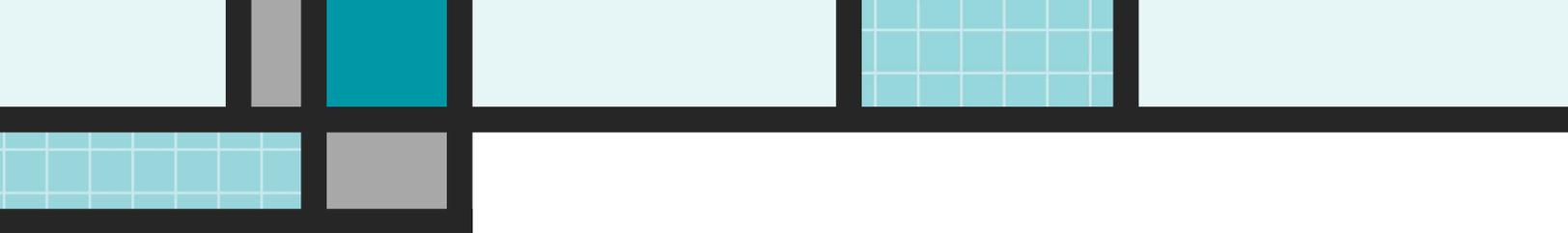
Appendix B: Implementation Plan Template

Improvement Strategy Name: _____

Date:_____

1. Goals and Strategies

Problem Statement
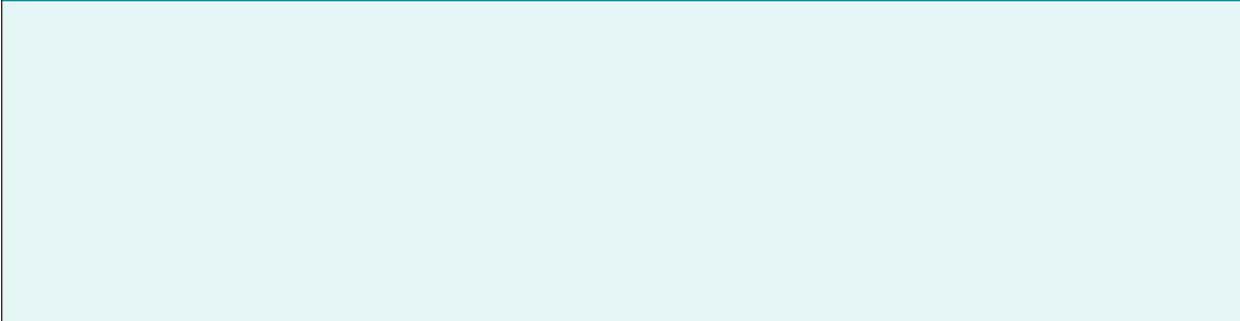
Goal Statement
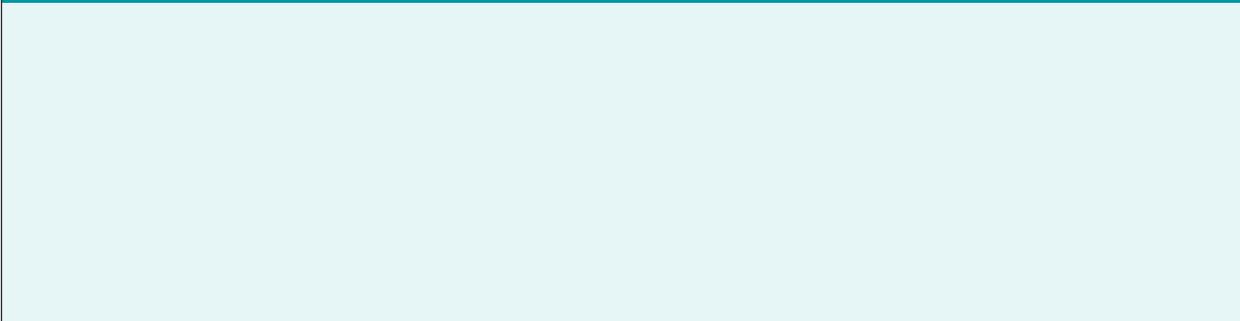
Strategy Description
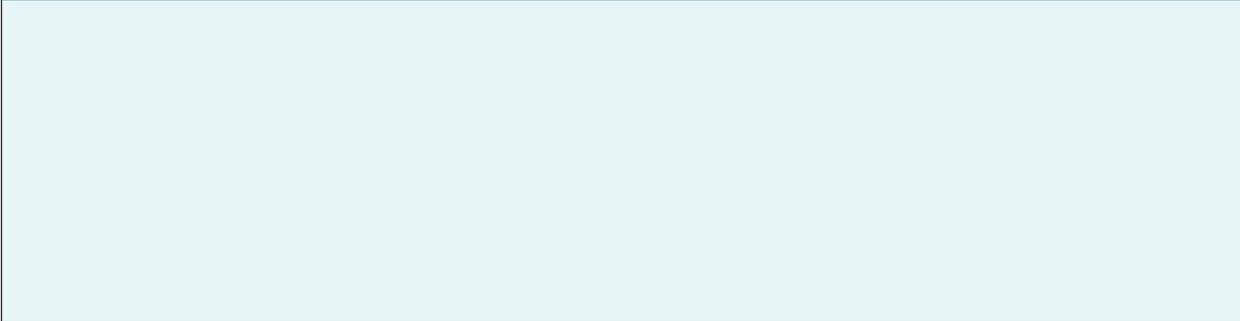
2. Approach

Project Team Members

Role	Name	Title	Department

Barriers to Successful Implementation (actual or potential)

Method of Improvement (check one or more)

Plan, Do, Study, Act	☐
Lean	☐
Other	☐

Implementation Steps

Activity (e.g., data collection, staff training, development of new forms, purchases)	Who is responsible?	Due Date

Communications Strategy

Who needs to know about the strategy?	What information do they need?	When do they need the information?	Who will provide the information?

3. Estimated Time and Expenses

Estimated Number of Hours for Implementation				
Role	Name	Number of hours per week	Number of weeks	Total number of hours

Resources Needed for Implementation	
Resource	Estimated expenditure ($)

Approvals Needed			
Name	Issue for Approval	Date Approval Requested	Date Approval Obtained

4. Performance Measures

Performance Measures (check all that apply)	
ED Arrival to ED Departure – Admitted Patients	☐
ED Arrival to ED Departure – Discharged Patients	☐
Admit Decision Time to ED Departure	☐
Left Without Being Seen	☐
ED Arrival to Bed	☐
ED Arrival to Physician	☐
Other Measure:	☐
Other Measure:	☐
Other Measure:	☐

Appendix C: Example Implementation Plan

Improvement Strategy Name: Mid-Track: The Solution to the ESI 3 Conundrum

Hospital: Good Samaritan Hospital Medical Center

Date: May 14, 2009

1. Goals and Strategies

Problem Statement
In 2007, we identified that our left-without-being-seen (LWBS) rate of 3.5% was higher than acceptable. We implemented a plan to address this issue, and the LWBS rate dropped by nearly 45%. Though this represented a dramatic reduction, this rate eventually "plateaued" over the next 2 years at 2%.   When we analyzed these data, they clearly demonstrated that the Emergency Severity Index (ESI) 3 patients represented the most significant subgroup in the LWBS data. In fact, over 75% of all walk-outs were patients triaged to an ESI category 3, and 85% presented with one of six chief complaints. This patient population also had the longest wait time to be seen by a physician.

Goal Statement
To expedite the care of the ESI 3 subpopulation of patients by reducing walk-out rates by 25% and an average time-to-provider to less than 60 minutes. We hope to achieve this within 3 months of initial implementation. We plan on implementing on 8/4/09. Therefore, we should reach this goal by the end of 10/09.

Strategy Description
We will identify a subset of ESI 3 patients that will be affected by this strategy. This subset will include patients (1) whose chief complaint is any of the following: abdominal pain, vaginal bleeding, pregnancy complication, vomiting, flank pain, or headache; (2) those who meet predefined criteria; and (3) those who arrive to the ED Monday through Friday between 4 p.m. and 11 p.m.   We plan a two-step process for expediting care for ESI 3 patients. The first step is to add a physician to triage Monday through Friday between 4 p.m. and midnight (stretch will be extra hours and 7 days if possible). The subset of ESI 3 triaged patients will be referred directly to the physician in triage who will begin the evaluation of the patient and order appropriate tests. The second step is to utilize the ambulatory surgery unit (ASU) (which is one floor above the ED) as the ESI 3 patient district (mid-track). Here a nonphysician provider (NPP) will receive the patients and coordinate their care with the physician in triage.

To implement this strategy, we first had to identify an area of the ED that we could assign as the mid-track. We attempted to do this within the ED by reassigning one of the four geographic districts. However, the other districts were quickly overwhelmed with ESI level 1 and level 2 patients, and a disproportionate amount of acuity was being handled by the remaining three districts. This resulted in a number of complaints from the staff, and we terminated the pilot after the initial 1-month period. However, we needed to identify another space to house mid-track.

The ASU is directly above the ED, proximate to the ED staff and our radiology services. This area has operations between 6 a.m. and 6 p.m., with a significant decrease in census at 4 p.m. We approached administration, and approval was obtained to use this area after 4 p.m., with certain caveats:

1. We would only occupy one area of the ASU from 4 p.m. through midnight. The other areas would continue to operate, and some areas would be prepped for the next operating day and left undisturbed.

2. Housekeeping had to be involved and would be responsible for cleaning the area used by the ED once we left the ASU after midnight.

3. The ED would be responsible for bringing up supplies needed for our patients.

4. The ED purchased 12 reclining hospital chairs for our patients to use. No stretchers would be used for this project, as we felt patients needed to be ambulatory to qualify for care in this location.

5. The ED identified nursing staff and clinical staff to supervise the patients. We identified the nurse practitioners as the ones to supervise the patients and LPNs to assist them. All care would be coordinated with the physician in triage.

6. Security had to be involved. We placed security personnel on scene in the ASU during the 8 hours of operation. This was done only as a precautionary measure.

7. A protocol had to be developed to identify what types of patients would be best suited for care in this environment. It would also dictate the time of day that new patients would no longer be transferred to the ASU, as well as the procedure for transferring existing ED patients in the ASU back to the ED when the ASU-ED project ended for the day (at midnight).

8. The medical staff had to be informed that patients might be in this area, as this was a new protocol. This could be accomplished at general staff meetings and via notices and letters.

9. The ED attending staff had to familiarize themselves with the protocol and the details outlining the expectations for patient selection as well as hand-off of patients that straddled shifts. This process of education for the ED attending physicians as well as the ED staff was expected to take several months.

10. Once the project was started, feedback would be requested constantly and data reviewed. Protocol adjustments could be made based on this feedback process.

We also had to identify a location within triage that the physician could occupy. We have five triage bays, and one is currently used for performing EKGs. This bay will be used for the physician. It contains a computer for documentation and an exam table/stretcher for evaluations. The physician in triage would only see a patient after the triage nurse assessed the patient and determined that the patient qualified for care under this new protocol. The physician would have the right to reassign the patient to the main ED if he or she felt that the severity of illness warranted it.

Conceptually, we realized that adding more space would not necessarily address the core problem: inpatients occupying ED beds and increasing the throughput times for all ED patients. However, given our options, this approach seemed to allow us to address the issue with expediency, while simultaneously developing programs to address the inpatient aspect of the throughput issue.

2. Approach

Project Team Members		
Name	**Department**	**Role on Team**
A. Sharma	Emergency	Project Director
S. Dries	Administration	Senior Leader
D. Alese	Administration	Senior Leader
T. Nolan	Administration	Nursing Leadership
J. Margulies	Emergency	Senior ED Physician
C. Butler	Emergency	Nurse Manager
K. Rios	Emergency	Nurse
C. Cicote	IT	System Analyst
K. Lock	Administration	Quality Manager
G. Leonte	Inpatient Units	Hospitalist

Barriers to Successful Implementation (actual or potential)
1. Additional staff needed: Physician, NPP, support staff, transport staff, etc.
2. "Buy-in" from staff.
3. Approval to use ASU space for this project.

Implementation Steps

Activity (e.g., data collection, staff training, development of new forms, purchases)	Who is responsible?	Due Date
Obtain access and approval to use ASU for the ESI 3 patient district	A. Sharma	3/1/09
Hire additional physician, nurse practitioner, and support staff	A. Sharma	4/1/09
Purchase necessary equipment	A. Sharma	6/1/09
Arrange for housekeeping to clean the new district after midnight	A. Sharma	6/1/09
Arrange for security to be stationed in the new district during its open hours	A. Sharma	6/1/09
Create policies and procedures for (1) physician triage and (2) the new district	A. Sharma	6/1/09
Identify nursing staff and clinical staff to supervise patients in the new district	A. Sharma, C. Butler	6/1/09
Establish best-practice protocols for chief complaints	A. Sharma	6/1/09
Coordinate and orient nursing staff, techs, and support staff	C. Butler	6/1/09
Orient physicians and nurse practitioners	A. Sharma	7/1/09

Communications Strategy

Who needs to know about the strategy?	What information do they need?	When do they need the info?	Who will provide the info?
Administration	Implementation plan, policies, procedures, timelines		A. Sharma
ED Physicians	Implementation plan, policies, procedures, timelines, expectations		A. Sharma
Medical Staff	Implementation plan, policies, procedures, timelines, expectations		A. Sharma
ED Nursing Staff	Implementation plan, policies, procedures, timelines, expectations		C. Butler
Support Staff	Implementation plan, policies, procedures, timelines, expectations		C. Butler

3. Estimated Time and Expenses

Estimated Number of Hours for Implementation				
Role	**Name**	**Number of hours per week**	**Number of weeks**	**Total number of hours**
Administration				13
ED Chair and Physicians				35
Registration Manager				4
Data Analyst				13

Resources Needed for Implementation	
Resource	**Estimated expenditure**
GYN stretcher	$12,000
Construction project for physician triage station	$8,000
Physician and lab tech	$300,000

Approvals Needed			
Name	**Issue for Approval**	**Date Approval Requested**	**Date Obtained**
Administration	To use the ASU as an ESI 3 district	2/11/09	2/11/09
ASU	To use the ASU as an ESI 3 district	2/11/09	2/11/09
Infection Control	To use the ASU as an ESI 3 district	2/11/09	2/11/09

4. Performance Measures

Performance Measures (check all that apply)	
ED Arrival to ED Departure – Admitted Patients	☐
ED Arrival to ED Departure – Discharged Patients	☐
Admit Decision Time to ED Departure	☐
Left Without Being Seen	☐
ED Arrival to Bed	☐
ED Arrival to Physician	☐

Appendix D: Additional Readings

Bursting at the Seams
Marcia J.Wilson and Khoa Nguyen
Accessible at: http://urgentmatters.org/media/file/reports_UM_WhitePaper_BurstingAtTheSeams.pdf
This report summarizes the experiences of 10 large hospitals that participated in UMLN I. There were several common factors that contributed to hospitals' success with the implementation of patient flow improvement strategies, including: (1) recognizing that ED crowding is a hospital-wide problem, not an ED problem; (2) building multidisciplinary, hospital-wide teams to oversee and implement change; (3) determining the presence of a "champion"; and (4) obtaining management's support. The report describes 17 key performance indicators that the hospitals used to evaluate their performance and provides examples of successful strategies.

Facilitators and Barriers to the Implementation of Patient Flow Improvement Strategies
Kevin Van Dyke, Megan McHugh, Julie Yonek, Dina Moss
Quality Management in Healthcare, 20(3):223-233, July-Sept 2011.
Using a qualitative research design, this report identifies common facilitators and barriers to the implementation of patient flow improvement strategies at the UMLN II hospitals and successful approaches for mitigating barriers. Factors facilitating implementation included participation in the learning network and strategic selection of team members. Common challenges included staff resistance and entrenched organizational culture. Some of the challenges were mitigated through approaches such as staff education and department leaders' constant reinforcement. The findings indicate that several facilitators and barriers are common to the implementation of different strategies. Leveraging facilitators and developing a strategy to address common barriers may leave hospital and ED leaders better prepared to implement patient flow improvement strategies.

Hospital-Based Emergency Care: At the Breaking Point
Washington, DC: Institute of Medicine; 2007.
Available at: http://www.nap.edu/catalog.php?record_id=11621#description
This IOM report describes the emergency care system in the United States including its strengths, limitations, and future challenges. Numerous issues are covered, including the role and impact of the emergency department within the larger hospital and health care system, patient flow, workforce issues, and the quality of emergency care services. The report gives a number of examples of how crowding adversely affects emergency care and offers several recommendations for improving patient flow.

Hospital Quality Improvement: Strategies and Lessons from U.S. Hospitals
Sharon Silow-Carroll, Tanya Alteras, Jack A. Meyer
New York: The Commonwealth Fund, April 2007
Accessible at: http://www.commonwealthfund.org/Content/Publications/Fund-Reports/2007/Apr/
Hospital-Quality-Improvement--Strategies-and-Lessons-From-U-S--Hospitals.aspx
This report focuses on the dynamics of hospital performance and how hospitals achieve and sustain improvements over time. Case studies of four hospitals that made substantial improvements reveal a pattern: (1) a trigger such as a crisis or new leader serves as a "wake-up call" that prompts the hospital to make (2) organizational and structural changes such as multidisciplinary teams, quality-related
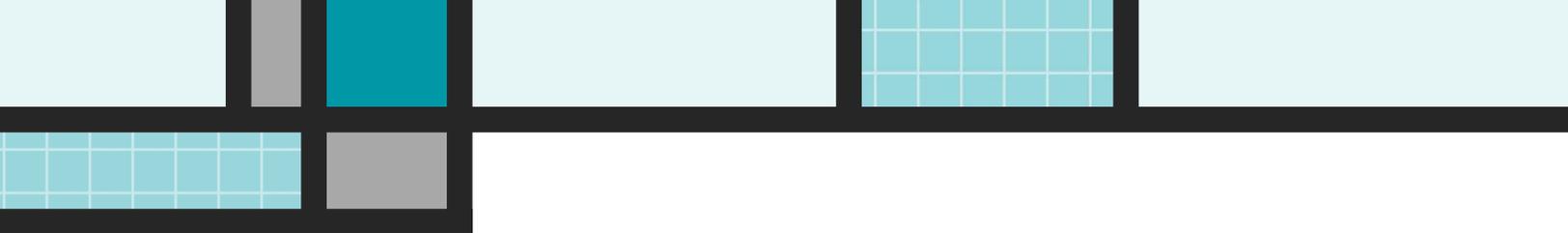
committees, and technology investments, which facilitate (3) a systematic problem-identification and problem-solving process, resulting in (4) new treatment protocols and practices, which in turn result in (5) improved outcomes. Success strengthens commitment to quality improvement and turns this temporal pattern into an ongoing cycle. The entire process reflects the establishment, growth, and reinforcement of a culture of quality.

The Improvement Guide: A Practical Approach to Improving Organizational Performance
Gerald J. Langley, Ronald Moen, Kevin M. Nolan, et al.
San Francisco: Jossey-Bass Publishers, 1996.
In this book, the authors take Edward Deming's Plan-Do-Study-Act premise and provide demonstrations of rapid improvement initiatives with stories from business, law, and health care to illustrate the successes of this approach. Applicable tools and practical ideas couch the concepts in concrete experience. A resource guide to change concepts is included.

Improving Patient Flow and Reducing ED Crowding: Evaluation of Strategies from the Urgent Matters Learning Network II
Megan McHugh, Kevin Van Dyke, Julie Yonek, Embry Howell, et al.
Health Research & Educational Trust, Contract Final Report prepared for the Agency for Healthcare Research and Quality; 2011.
This report summarizes the findings from an evaluation of UMLN II. It describes the facilitators and challenges to implementation, the time and resources needed to implement patient flow improvement strategies, and the impact of the strategies on measures of patient flow.

Time and Expenses Associated with the Implementation of Strategies to Reduce Emergency Department Crowding
Megan McHugh, Kevin Van Dyke, Julie Yonek, Dina Moss
Journal of Emergency Nursing, forthcoming 2011.
This article describes the time spent and expenses incurred as the six UMLN II hospitals planned and implemented strategies to improve patient flow and reduce crowding. Eight strategies were implemented. Time spent planning and implementing the strategies ranged from 40 to 1,017 hours per strategy. The strategies were largely led by nurses, and collectively, nurses spent more time planning and implementing strategies than others. The most time-consuming strategies were those that involved extensive staff training, large implementation teams, or complex process changes. Only three strategies involved sizable expenditures, ranging from $32,850 to $490,000. Construction and the addition of new personnel represented the most costly expenditures.
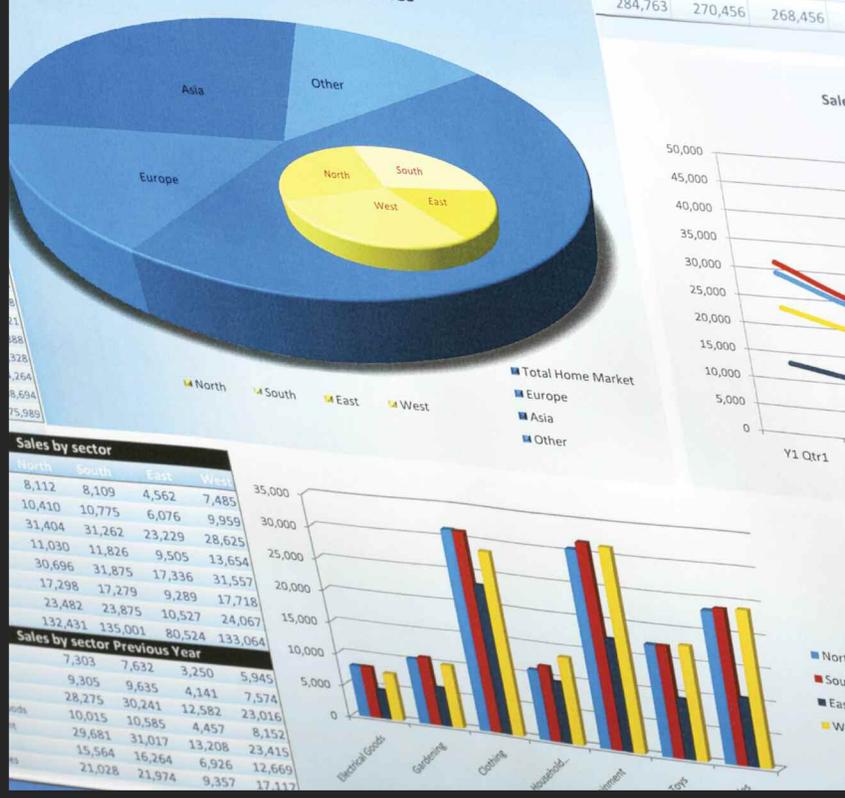
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