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INTEGRATING QUALITY IMPROVEMENT AND RISK MANAGEMENT

The interconnectedness among quality improvement (QI), patient safety, risk management, and medical malpractice is becoming increasingly clear. By fully integrating these disciplines and infrastructure, organizations can avoid redundancy and each silo can freely share its information and strategies. The Los Angeles County Department of Public Health, the largest county-run health system in the United States, is fully integrated. The central offices share space and personnel. The employees carry a heavy case load effectively and have launched a number of wide-reaching patient safety initiatives. The quality initiatives and their associated data alert leaders to risk management problems and medical malpractice issues before

Excerpted from Risk Management and the Emergency Department by Shari Welch, Kevin Klauer, and Sarah Freymann Fontenot (Health Administration Press, 2011).
they become manifest via *sentinel events*. This work can be seen as a continuum with quality improvement work at one end and medical malpractice cases at the other (Exhibit 3.1).

### The Elements of a Robust QI Program

- Census data
- Performance metrics
- Operational data
- Provider performance
- Improvement projects

Quality improvement work requires two important elements: data and methodology. QI cannot be done effectively without data, and all QI initiatives should be data driven. The important data elements, as well as low-tech and high-tech mechanisms for obtaining the data, will be presented in this chapter. A methodology should be adopted for improvement projects. There are many methodologies out there, from Juran to Six Sigma, from plan-do-study-act (PDSA) to Lean thinking. Among QI workers, there are devotees of every sort. Each methodology offers a discipline for performing QI work, and each is data driven. The science behind improvement work is often misunderstood by those involved in traditional medical research, but it has been shown to be effective in industry for more than 50 years.

**Sentinel event:** Any unanticipated event in a healthcare setting not related to the natural course of the patient’s illness resulting in death or serious physical or psychological injury to a patient or patients.
Back to a discussion of data—there are two ways to get at quality performance. You can count absolute events and report them as a proportion, such as left without being seen (LWBS) percentages, or you can measure time and report an indicator, such as median length of stay (LOS). All improvement work should use a measurement to gauge the success of the change.

There are data that define a department and data that measure its performance. Census data describe what is going on in the department. Examples of census data include census by day, month, and year; percentage of admissions; percentage of ICU admissions; percentage of transfers; percentage of pediatric patients; and number of trauma patients. Census data can help a department manage demand capacity and place the department within the right cohort group. Departments with robust QI programs usually have fewer walkaways and often see unexpected growth in census, but most census data do not reflect performance. Instead the data provide a contextual understanding of the operations for a given department. Census data define the ED and what kind of care will be rendered there.

Besides census as a characteristic that defines an ED (reported as patients per day and as annual census), there are operating characteristics such as pediatric volume, admission rate, transfer rate, and current procedural terminology (CPT) coding data, to name a few. Together census data and operating characteristics create a profile of an ED suggesting the acuity of care provided and the services expected by the community. These data help describe a department and help place it in the right comparison group for benchmarking. They are the “genetic makeup” of a department, analogous to height and eye color. By gathering and understanding these data, ED and hospital leaders can seek to characterize each department for appropriate comparative analysis with similar departments. Leaders can also track these characteristics over time to better understand the services being provided to the community and plan for those needed in the future.

**Examples of Census Data**

- Census (annual ED volume)
- Acuity by emergency severity index
- Acuity by evaluation and management codes
- Acuity by admission rate
- Census by patient age (pediatric volumes)
- Payer mix
In addition, there are data that measure ED performance. These metrics include *time measures* such as LOS and *door-to-balloon time*, which are typically reported as medians. They also include *proportion measures* such as the “walkaway” categories: LWBS, against medical advice (AMA), and left before treatment complete (LBTC), which are typically reported as percentages. These are the most widely used metrics found in the emergency medicine literature. These metrics have become de facto measures of quality and have been employed in ED benchmarking. Time intervals in the emergency department are currently undergoing feasibility studies by the Centers for Medicare & Medicaid Services (CMS) and are likely to be regarded as quality measures in the proposed value-based purchase model to be employed in the near future.

**Examples of Performance Measures**

- Length of stay (LOS)
- Door-to-balloon time and other core measures
- Walkaways (LWBS, AMA, LBTC)
- Complaint ratios
- Throughput for processes
- Time to pain treatment
- Door-to-physician time

Time measures are becoming increasingly the focus of CMS, payers, and the public. Emergency departments that want to get upstream of the performance measurements that will be used in CMS’s value-based purchase scheme (pay for performance) should begin to track time stamps and time intervals of ED visits. In 2010 the Second Performance Measures and Benchmarking Summit defined and clarified the metrics that are in use for emergency medicine (Welch et al. 2010). Exhibit 3.2 shows the increasing granularity of the data that EDs will eventually be reporting via these time stamps and intervals. The appendix to this chapter provides the definitions for these metrics.

The robust QI program should also include operational data. As ED leaders begin to characterize through data the operations and processes that are part of an ED visit, they can improve patient flow through the ED and through the system. As a program develops, the data captures become increasingly granular.
Chapter 3: Setting Up a Comprehensive Quality Improvement Program for Your ED

Exhibit 3.2: ED Timestamps and Intervals

SOURCE: Reprinted from Welch et al. (2010).

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Examples of Operational Data

- How many?
- When?
- How long does it take?
- What are the steps in the process?
- Who owns each step?
- Labs
- Plain films
- CT
- Ultrasound
- ECG
- Respiratory Tx
- IV fluids

As the program evolves, these data get more detailed to help the frontline workers understand and identify the causes of operational delays. For instance, it is not enough to know the interval time from when an x-ray is ordered until the results are available to the provider. More useful would be an examination of the subcycles of radiology operations, which would enable a department to better understand its bottlenecks. For instance, if radiology service is found to be the source of delays in a department and turnaround times for the x-ray or CT subcycles are too long, the next question should be where exactly in the process is the delay occurring? The subcycle time intervals (see Radiology Operational Subcycle Time Intervals box) would help the department to identify whether the delay would be remedied with a transport tech, another radiology tech, another radiologist, or a new IT system.

Two other elements will enhance the QI program: provider performance and QI projects. Provider performance will be discussed at length in Chapter 7 when we focus on the Joint Commission Ongoing Practice Performance Evaluation. Before launching into a basic method for performing QI projects, let’s put all of these data elements into perspective in a discussion of something new: volume-band behaviors.

Radiology Operational Subcycle Time Intervals

- Order to return x-ray: 47 minutes
- Order to transport: 18 minutes
- Transport to return: 18 minutes
- Return to results ready: 13 minutes
New data collected from EDs in a survey by the Emergency Department Benchmarking Alliance (EDBA) suggest a comparison scheme that makes sense based on patterns identified and correlated with census and acuity (Welch et al. 2010). When EDs are grouped into quintiles (volume bands) of 20,000-visit increments based on the number of annual ED visits, several performance patterns emerge. Operating characteristics also differ among EDs based on the volume band occupied. The operating characteristics help to describe and define the work being carried out in the ED. Exhibit 3.3 shows the differences in operating characteristics and performance as a function of ED volume.

Statistically significant trends can be seen in the data. As annual census and daily arrivals increase, the percentage of high-acuity patients rises, the admission
rate rises, and the transfer rate falls. In addition, as census increases, the percentage of patients arriving by EMS and the rate of admission of these patients go up, while the percentage of admissions originating in the ED decreases. In general terms: Size matters, and performance capability on metrics is dependent upon the ED annual volume. This will be important when CMS begins rolling out its pay-for-performance program. Like departments should be compared to like departments.

**How to Implement a Simple QI Project**

Each focused audit/QI project involves the following five steps in sequence:

1. Development of an aim statement (including stretch goals)
2. Identification of data measures with baseline data and method of measurement
3. Development of a change package, usually through teamwork
4. Planning and execution of a pilot study
5. Full implementation or rollout

The *aim statement* lays out the goal of the focused audit or project. It is specific in terms of what is to be measured (How will we know that a change is an improvement?) and the time frame in which the project will take place. *Data measures* are data points that can be used to monitor and evaluate the quality of the processes that affect patient care. These are the metrics to be measured and tracked to demonstrate whether an implemented change is truly an improvement. Well-implemented QI projects do not run on intuition. The data tell the team whether or not the change has been an improvement. Where there is no IT support for data collection, an ED can get rudimentary data from the ED patient log and spot audits. If needed, charts may be audited each month for these census data and metrics. Sometimes smaller EDs with little or no IT support are the most creative in terms of their quest for data. For example, a smaller ED working as part of the IHI Innovation Community in 2006 set up a simple mechanism to find how many bags of IV fluid were being used by day and by shift. As a nurse or tech pulled the rubber plug off the IV bag and pierced the bag with the tubing, the plug went into a tin can next to the cupboard housing the bags. At the end of the day, the plugs were counted to determine how many bags were used (Welch 2009b). Still, it is noteworthy that the complexity of patient care being delivered and the amount of data being generated in the ED are no longer manageable without IT support.
The change package is typically crafted by a team, such as a task force of stakeholders interested in successful change around a process or project. Unlike the traditional medical research model in which variables are controlled and one intervention is made, often many small changes will occur simultaneously in the department as part of the change package. The pilot study is critical to managing change during an improvement project. Rather than rolling out change widely before identifying problems with the new process, a smaller-scale trial is done to identify glitches before the process is introduced to the department at large. One important strategy recognized by experts in change management is to pilot the innovation with “A-Team” members, people who want the pilot to succeed. You can demonstrate success with data and present the pilot results to the rest of the department to generate enthusiasm for the change.

Following the pilot (or two) and other preparations, the change is rolled out. Educating staff through e-mails, posters, and even slogans and T-shirts can help launch a successful improvement project.

THE ROLE OF EXECUTIVE LEADERSHIP

The Institute for Healthcare Improvement has long recognized the notion that sponsorship from the executive level is critical to the success of improvement work. This calls for clear and unqualified sponsorship of each project from the C-suite. The CEO should come to the clinical unit to support the changes early in the piloting. She should be concerned with the success and let the rank and file see her concern. Clever leaders find small ways to reward the change agents in the project and the staff workers who will be making sacrifices as the project unfolds. Change is rarely easy, and this type of executive-level sponsorship can keep morale up and momentum going during difficult change projects.

Case Study

Patients who are ill with septic shock do best when they are taken as quickly as possible to the ICU and a number of simultaneous interventions now called “the septic shock bundle” are begun. These interventions are difficult to fully execute in a busy emergency department. The necessary one-on-one physician and nurse care and other resources are easier to provide in the ICU than in the ED. After spending more than four hours in his emergency department caring for a critically ill patient with septic shock, Dr. Steve Souter, a 20-year veteran emergency room physician, decided to tackle the delays in admission to the ICU for critically ill patients head on.
He met with the intensivists, nurses, managers, and administrators at Intermountain Medical Center and headed up a process change that enables the ED physician to expedite the admission process of critical care patients. Following the rapid response team model used so successfully elsewhere, the team developed this simple process: When a patient meets critical care criteria, an “ED-ICU Priority 1” is called. A conference call using a special call-in system is arranged, and the physician gives a report to the ICU team including respiratory therapy, the intensivist, the charge nurse, and the nursing supervisor. Immediately following the call the critical care service sends down a team to accept the hand-off in person and transports the patient to the ICU. The whole admission process is expedited for the good of the patient and the emergency department.

This process model succeeded and is an example of how process improvement does not occur by committee but rather by innovation at the front lines. It also shows how one committed individual, organizing a team or task force of stakeholders, can move an institution!

**Results:**

<table>
<thead>
<tr>
<th>LOS admitted patients</th>
<th>300 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOS “Priority 1” patients</td>
<td>&lt;1 hour</td>
</tr>
</tbody>
</table>

When patients are admitted using the old admission process, the LOS is 300 minutes, which is just too long for an unstable ICU patient. After implementation of the Priority 1 process, patients are admitted to the ICU in well under an hour.


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**Strategies for Healthcare Executives**

- Understand the elements of a robust QI program and how it provides the platform for risk management work.
- Commit the technology and personnel resources necessary for such a program.
- Lend sponsorship and support for each innovation in the ED so there is never any question of your commitment to the quality and safety culture.
- Encourage the integration of the QI department and the risk management department to increase cost effectiveness and allow risk to be identified before a sentinel event.
Recommended Readings


APPENDIX 1

Timestamps

- **Arrival time**: The date and time that the patient first arrives at the institution for the purpose of requesting emergency care should be recorded as the arrival time. This is the first contact, not necessarily the registration time or the triage time.

- **EMS offload time**: The date and time that the patient is transferred from the EMS stretcher, placed in a treatment space, and care is assumed by the ED staff. This is typically recorded in the EMS run report.

- **Treatment space time**: The date and time of placement in a treatment space. “Treatment space” refers to any space the hospital or facility designates as a space to render emergency care.

- **Provider contact time**: The date and time of first contact between the patient and the physician or the provider (defined as an institutionally credentialed provider but specifically not the triage nurse) to initiate the medical screening exam.

- **Data-ready time**: The date and time when all relevant data—test results, image interpretations, and treatment responses—are available to the provider for decision making regarding patient disposition. (Most EDs do not have IT to enable the capture of these data yet, but we anticipate it will eventually be available routinely in future IT systems.)

- **Disposition decision time**: The date and time that the order regarding the disposition of the patient (transfer, observe, discharge) is documented.

- **Admit decision time**: The disposition decision time applied to admitted patients. The date and time that the admit order is documented by the provider.

- **Departure time**: The date and time of physical departure of a patient from the ED treatment space for all categories of patients, including admitted, discharged, observed, and behavioral health patients.
Time Intervals

◆ **Arrival-to-provider time** (a.k.a. “door to doc”)
◆ **ED length of stay**: Arrival time to departure time. This is tracked for the following subsets of patients:
  – Admitted patients
  – Discharged patients
  – Observation patients
  – Behavioral health patients
◆ **Arrival-to–treatment space time**
  – Treatment space to provider time
  – Provider to data-ready time
  – Data ready to decision time
◆ **Decision-to-departure time**: Disposition decision time to the actual departure time of the patient.
◆ **Admit decision-to-departure time**: The decision-to-departure time applied to admitted patients. This metric is undergoing testing as a trial for CMS Hospital Inpatient Quality Measures.

Subcycle Intervals

For clarity and consistency the term “turnaround time” has been replaced with “interval” in the subcycles definitions. Turnaround time was used inconsistently in the literature and in practice and so was abandoned.

◆ **EMS offload interval**: Arrival time to EMS offload time.
◆ **Triage interval**: The time from the initiation to the completion of rapid or comprehensive triage or intake by an institutionally credentialed provider.
◆ **Laboratory interval**: The time from the order for laboratory testing until the time the results are available.
◆ **ED consultation interval**: The time from the order for an ED consult until the time the patient is evaluated by the consulting service and the final recommendation is communicated to the ED provider.
◆ **Imaging interval**: The time from the order for an imaging test until the time that the results are available. Institutions are recommended to track for each modality:
  – Plain radiography
  – CT scans
– Ultrasound
– MRI

**Bed assignment interval**: The time from the order or request for an inpatient bed to the time a bed is assigned (empty, clean, and staffed) and the ED receives notification.

### Proportion Metrics

A number of measures reported as percentages or rates can capture elements of performance in the ED. The proportion metrics are well established in the literature and in hospital operations. Patient complaints and walkaways correlate with timeliness in the ED (Welch et al. 2006). Think of them as indirect markers for timeliness and efficiency.

- **LWBS**: All patients who leave the ED before being seen by a provider.
- **LBTC**: All patients who leave the ED after being seen by a provider but before formal disposition is made.
- **AMA**: All patients who leave the ED against the advice of the provider and after the risks and benefits of further care have been explained and documented. AMA patients are a subset of LBTC patients.
- **Complaint ratio**: All spontaneous written, phoned, or spoken expressions of concern brought to the attention of the ED management or hospital staff. There must be a mechanism for recording these expressions, and the mechanism will be institution-specific. Complaint ratios are tracked by convention as complaints per 1,000 ED visits.

SOURCE: Welch et al. (2011).