



# What Gets *Measured* Gets *Managed*



How an EDIS can be used to collect data and manage patient throughput to ease ED overcrowding.

By Zbigniew Kornecki, RN, BSN, CEN

**T**he problem of Emergency Department (ED) overcrowding is fast becoming a national crisis. According to a 2005 report published by the Centers for Disease Control and Prevention titled “Visits to U.S. Emergency Departments at All-Time High; Number of Departments Shrinking,” from 1993 to 2003, trips to EDs increased by more than 20 percent and the number of available emergency centers decreased by 15 percent. Although many EDs have implemented “fast tracks,” the average waiting time to see a physician is 46.5 minutes and, according to the study, on average “patients spent 3.2 hours in the ED, which includes time with the physician as well as other clinical services.”

A 2007 study from the American Hospital Association titled “The 2007 State of America’s Hospitals – Taking The Pulse” showed that, of those hospitals surveyed, “nearly half of the EDs were over or at capacity.”

In 2006, testifying before the U.S. Senate, Robert R. Bass, M.D., F.A.C.E.P, executive director for Maryland Institute for Emergency Medical Services and president of the National Association of EMS Officials stated, “Many emergency departments today are severely overcrowded with patients, many of whom are being held in the ED because no inpatient bed is available.”

The committee offered three recommendations to address ED overcrowding, one of which is that “hospitals should reduce crowding by improving hospital efficiency and patient flow, and using operational management methods and information technologies.”

Improving hospital efficiency and patient flow requires an understanding of how the current patient flow can be modified to best support the desired practices. Assessing normal clinical flow and exceptions includes triage process overview, registration process and the identification of special cases, such as psychiatric, obstetric and trauma. Ascertaining their specific flow is the required first step to re-engineer and streamline processes that can reduce patient wait times, which in turn can help reduce overcrowding and ease overburdened EDs.

## Local Impact

Frankford Hospital-Torresdale is a 239-bed, medical/surgical facility that offers comprehensive health and wellness services for the whole family. The hospital provides inpatient medicine, surgery and a comprehensive cancer center that

can handle 98 percent of all cancer treatments in a friendly, familiar environment. Torresdale is also a state-accredited Level II trauma center — one of the original nine trauma sites designated by the Commonwealth of Pennsylvania. Among its three locations, Frankford hospitals handle more emergency visits than any other hospital in the Delaware Valley.

At Frankford Healthcare System (FHCS) in Philadelphia, a steady increase in the number of annual patient visits prompted concerns of a potential increase in patient overcrowding. The national trends and concerns were being felt locally. At the Torresdale campus, one of Frankford’s three hospital locations, overcrowding was beginning to impact patient care, employee efficiency and job satisfaction. Nurses and clinicians were becoming frustrated when they could not provide their patients with adequate care.

Hospital revenue also was being effected whenever overcrowding caused the FHCS ED to go into “divert” status. On average, a hospital loses \$5,400 per admitted patient and \$400 per discharged patient when it’s forced to divert. During peak times, Torresdale’s ED averages four to five ambulance cases per hour with nine arrivals per hour not uncommon. Diversion losses quickly added up.

## Six Sigma Approach

To address these escalating concerns and improve patient throughput, FHCS formed a cross-organizational, multidisciplinary team to develop a plan to address overcrowding at the Torresdale campus. The assembled team, which included representatives from the ED, Nursing, Medicine, Care Management, Admissions, and Administration and Finance, used the Six Sigma Approach to improve their existing patient, workflow and business processes.

An internationally recognized management process, Six Sigma focuses on producing high quality results by following a rigorous analysis of data that can be used to drive decision making and business practices. For hospitals, identifying key performance measures, collecting data and reporting on them can positively impact internal patient handling processes and patient satisfaction.

FHCS followed the Six Sigma DMAIC Approach, which consists of the five steps; define, measure, analyze, improve, and control. As of December 2007, FHCS has successfully completed the first three steps for their initial project goal. The remaining two steps are ongoing and have become part of FHCS management initiatives.

### EDIS Measures Up

With the project goal defined and processes mapped for each department, the FHCS team needed a way to measure the time-start and time-end for each step of the patient flow process. In addition, measuring total elapsed time and determining areas of improvement were also needed. To gather key

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measurements, FHCS documented each leg of the ED visit, including: "arrival to triage;" "triage to ED;" "ED to M.D.;" "M.D. to disposition;" "disposition to leave;" and, "arrival to registration."

FHCS installed Wellsoft EDIS at their three hospitals in 2002 and 2003. All three locations are using it for triage, patient tracking and patient documentation. Nurses and physicians use it for electronic documentation of each patient encounter, lab and radiology orders, as well as results tracking and final disposition.

Every Wellsoft system automatically captures, time-stamps and tracks patient wait and activity times at each step of the ED visit. Patients are tracked from preadmission through final disposition, including all encounters and interventions. Patient data fields such as last intervention, evaluating clinicians, lab results and length-of-stay (LOS) are updated constantly to provide clinicians with pertinent, up-to-the-minute information.

Up to 32 time points are automatically collected with no input or manual intervention from FHCS staff necessary. These time-stamps correspond to each patient's overall LOS in the ED. FHCS used the time stamp data, which marked the beginning and end of each "leg" of the ED visit, to devise data collection plans.

Since March 2007, more than 20,000 patients have been tracked. The data includes ED statistics (e.g., total volume, average LOS, total holding time and staff hour per patient), fast track statistics (e.g., patients seen and patients per hour), bed placement statistics (e.g., bed request to assignment), and radiology and laboratory statistics (e.g., orders, completions and results postings). These "visit legs" were documented and the initial results were surprising.

### Show Me the Data

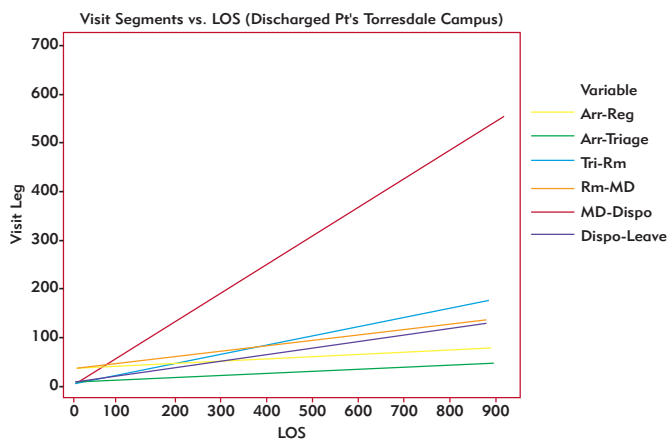
The FHCS team expected to find that the main factors impacting a patient's LOS and ED throughput would be the lack of a quick registration process and, "M.D. on Duty." The team believed that a quick registration process would start the ED process sooner than first completing a full registration, and also believed that the M.D. on duty directly affected the patient's LOS.

In actuality, when a quick registration process was implemented in October 2007, though registration time dropped from an average of 25 minutes to 2 minutes, it did not affect the throughput in the ER. Similarly, it was discovered that the information used to make decisions that effect disposition (e.g., point-of-care testing, ordering and receiving test results, and receiving information faster) had more of an im-

act on the patient's LOS than did the M.D. on duty. FHCS discovered that other factors were dramatically impacting patients' LOS:

**M.D. to Disposition** — The team found that the time between when a patient is evaluated by a physician to the decision to admit or discharge the patient has the greatest impact on patient throughput.

**Disposition to Leave (Admissions)** — The team also found that the time between the decision to admit the patient and the time the patient leaves has the second greatest impact on patient throughput.

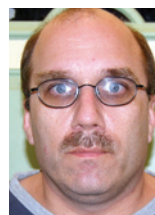


### Next Steps

With the first stage of analysis complete and the initial process improvement (quick registration) in place, FHCS is now concentrating on identifying process improvements for the M.D. to Disposition and Disposition to Leave legs of the ED visit. Areas being analyzed include the processes for laboratory and radiology orders, actual procedures and results sharing.

Data collection is an absolute requirement for Six Sigma and for FHCS. Not only do hospital staff identify key performance measures, but they also collect and report on them on a consistent basis. The team at FHCS has created a monthly dashboard that includes key data generated during and after each ED patient visit. This dashboard is shared with senior leadership to track the impact of process changes and improvements throughout the hospital.

As FHCS completes each process the change is also measured. The EDIS is our tool for capturing key statistics, and providing a means to measure change and improvement that will continue to be monitored and refined. As we have discovered, you cannot fix what you cannot measure. **HMT**



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