

Optimizing Patient Flow in the Enterprise

Hospitals can combine process management with information technology to redesign patient flow for maximum efficiency and clinical outcomes.

By Samuel Mahaffey, M.D., M.B.A.

It's a normal Sunday afternoon for 54-year-old Anne West until she experiences sharp chest pain. Her husband isn't home, so she calls for an ambulance to drive her to the ED. Anne suffers from acute myocardial infarction—a heart attack. Any provider can probably recite the chain of care events that take place between her arrival at the ED and her discharge three days later. However, the flow of these events, their timeliness and efficiency can fluctuate vastly. The time from her arrival to bed assignment, the lapse between tests and delivery of results, the efficiency of the discharge process—these are some factors that contribute to a complex, hospitalwide problem called “patient flow.”

For many healthcare executives, patient flow remains a nebulous catch phrase, although its symptoms hit home in countless ways: ED overcrowding and diversion, canceled surgeries, admissions delays, refused transfers and capacity/demand mismatches. Additionally, JCAHO's initial “Emergency Department Overcrowding Standards” has morphed into expanded standards for better patient flow in every department that interfaces with patients.

Improving patient flow across the healthcare enterprise is becoming more than a cutting-edge initiative: It's becoming an imperative. But how can a healthcare organization develop a manageable, cost-effective plan to address this seemingly unwieldy problem?

Blueprint for Success

Successful patient flow initiatives share several common elements. They begin with a vision for enterprise improvement and a foundation of quality information, and they are fueled by workflow automation. Once implemented, they are sustained by ongoing measurement and aligned incentives.

Vision. Improving patient flow requires a vision for enterprisewide improvement coupled with a manageable, incremental plan. Because patient flow touches every department, only an enterprisewide initiative can deliver sustained improvements.

Most capacity issues arise in the hospital's unique resources such as the ED, OR and ICU, where demand fluctuates and is seemingly unpredictable. Single-department solutions, however, may create or



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worsen bottlenecks in other areas. For example, if the OR improves patient flow, then PACU will experience new or greater bottlenecks unless it also makes improvements.

An incremental plan is a prerequisite for success. Beginning a patient flow initiative in a department such as the ED or the OR makes sense for many reasons. It eases the burden of integration and implementation, because IT staff can concentrate on one department at a time. It enables providers to observe and buy into the concept of improved patient flow, which can lead to more enthusiastic acceptance and more rapid dissemination.

Capturing Data Efficiently. Information is the foundation of any patient flow initiative. Patient flow is built upon the capture, integration and sharing of information, both within and across departments. While it sounds simplistic, this critical foundation can be immensely challenging to hospitals with numerous information systems and departments that operate as silos.

Most information capture should happen by integrating existing systems and technologies. These systems enable more intuitive data collection because they are already used by providers and staff. Examples include the telephone, pagers, PDAs, HIS, ADT and scheduling systems.

The introduction of a patient flow-specific solution should enhance, rather than attempt to replace, current systems. Ideally, it will enhance current information sources through rules-based workflow. Rules-based workflow makes information actionable, moving information from the static realm into the dynamic realm of workflow automation.

Workflow Automation (putting action in data). Actionable information triggers patient care events and enables automated prompts and reminders. It alleviates administrative grunt work and continuous polling for information. For instance, the OR nurse in one prestigious Southeast academic medical center makes an average of 32 calls during a case. With real-time access and dissemination of information, most or all of these calls could be eliminated.

Another example is the ED physician's receipt of a patient's lab results. If the physician receives the results but does not respond in an appropriate time frame, an escalated prompt may be sent to his pager. Real-time information facilitates decision-making, but actionable information facilitates workflow.

For the typical hospital with multiple information systems, integration is always a challenge. Incorporating rules-based workflow can help. A rules engine draws information from existing systems and devices, and then uses pre-defined rules to drive automated workflow and communication.

University Medical Center in Tucson is building, testing and editing rules as they learn what works and what doesn't. For example, one pre-op rule will trigger an alert to the anesthesiologist's pager if he or she is not present within 15 minutes of the patient's pre-op nursing evaluation. Another rule notifies a support services supervisor when a room has not been cleaned after a specific period. After monitoring throughput for three months, the staff will evaluate the effectiveness of the rules and adjust the alert times as needed.

Ongoing Measurement. Whether a hospital uses Six Sigma or another methodology for process improvement, a framework will help measure its starting point, set goals and track progress. During the second phase of the Six Sigma improvement model, for example, project managers analyze data to identify bottlenecks, poorly utilized resources, lengthy wait times and task redundancy. In the final and ongoing phase, these project managers will review real-time dashboards, statistical process control charts or other customized reports that track changes and improvements.

A standard metric for patient flow is not yet established, but several key benchmarks are excellent measurements for enterprise improvements. These benchmarks include length of stay, inpatient volume or throughput, and revenue generation.

Beginning Steps

Ideally, a patient flow initiative begins with process mapping to identify root causes in each department. Then, it uses a process such as simulation modeling to determine the most effective solutions. Simulation modeling enables the organization to create “what if” scenarios to determine various solutions.

For instance, if long wait times between ordering and getting X-rays create a bottleneck, simulation allows evaluation of various scenarios for improvement: the addition of a radiology technician, changes in the registration process or expansion of facilities. Process mapping and simulation modeling can help build the incremental project plan that will deliver the greatest ROI with minimized effort.

Historically, any enterprisewide project in a healthcare setting has been challenging due to its sheer size and depth. A patient flow initiative is no exception, and it requires the support of executive leadership and the participation of providers and staff. In addition to resource and budget requirements, a hospitalwide patient flow project presents other challenges.

It reaches across departments that may have conflicting goals and incentives. It requires extensive analysis to identify root causes and optimal solutions. It can't be “fixed” by merely implementing a new system. If positioned and implemented correctly, however, a patient flow initiative should be well-received. It will save time, reduce frustration and improve patient care—common goals among healthcare executives, providers and staff.