Enhancing Patient Flow in an Acute Care Hospital: Successful Strategies at the Juravinski Hospital

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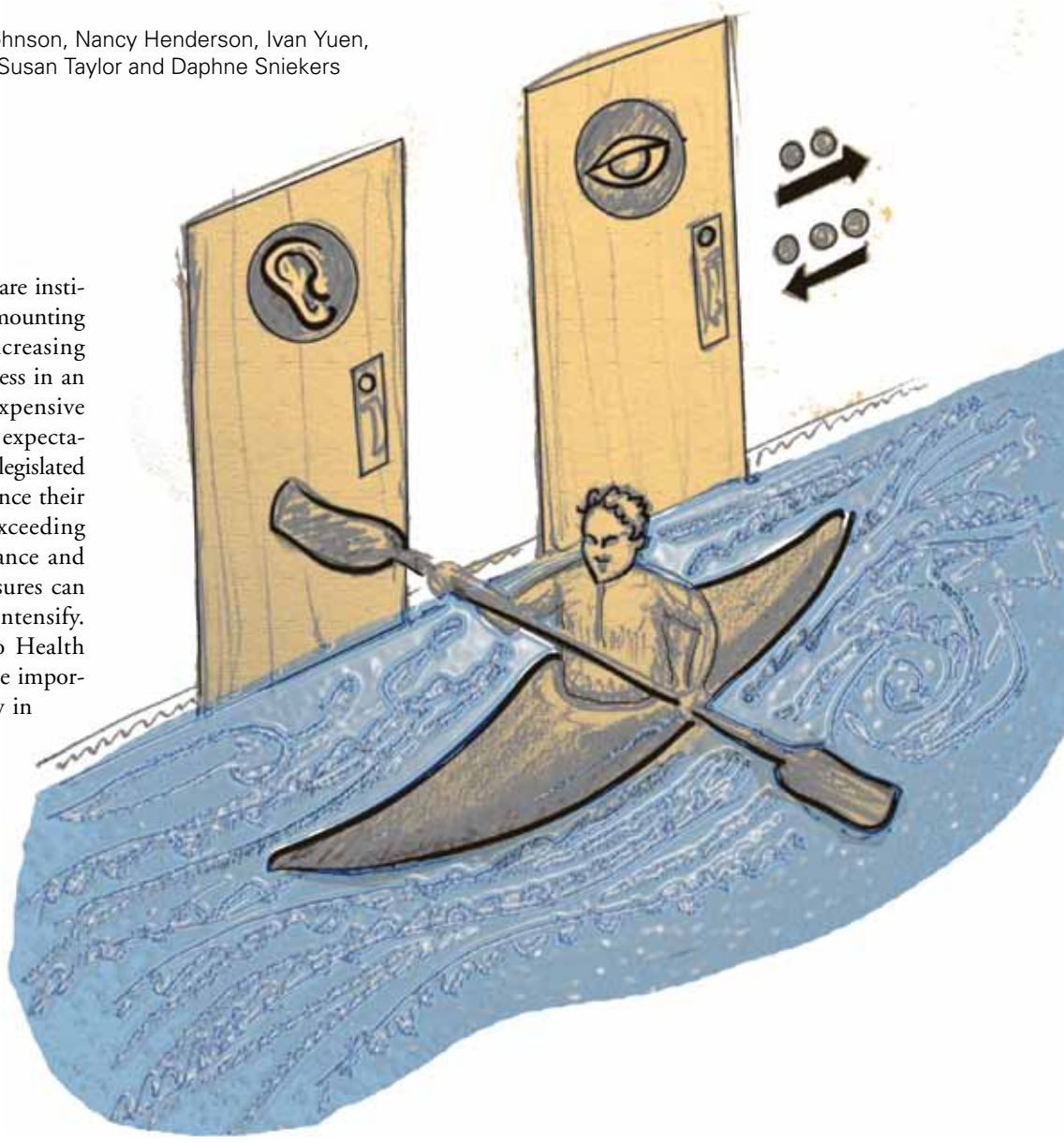
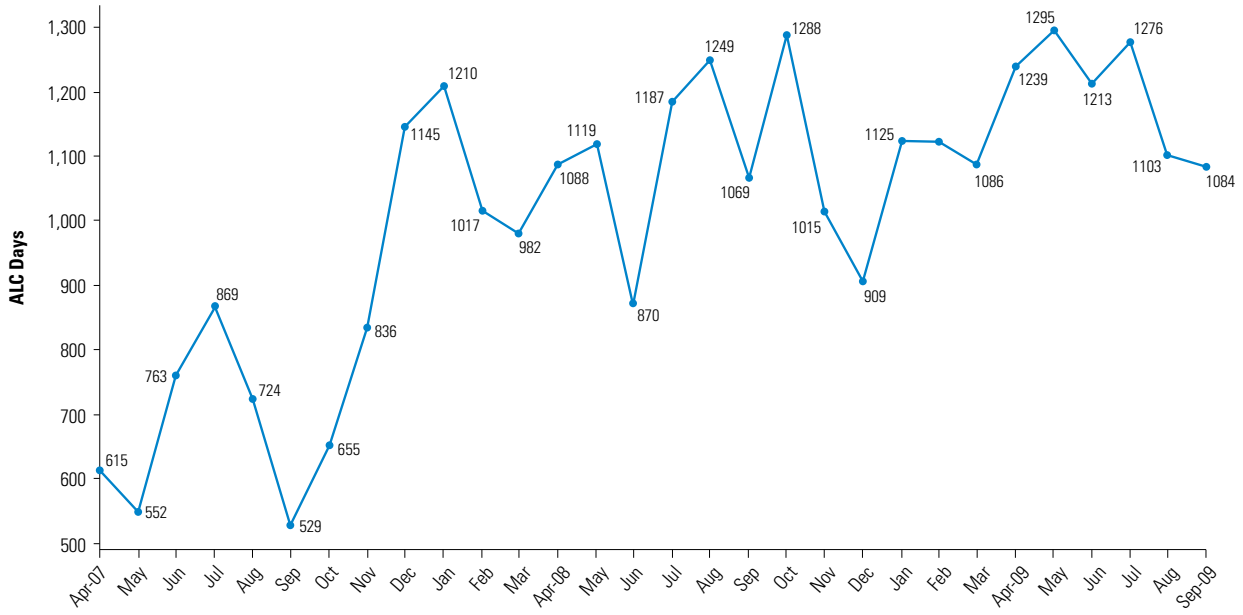


Publicly funded healthcare institutions are faced with mounting pressure from the increasing burden of chronic illness in an aging population, new and expensive technologies and high public expectations. In Ontario, there is also a legislated requirement that hospitals balance their budgets while achieving or exceeding provincial targets for performance and quality. These competing pressures can be expected to continue and intensify. A 2006 report of the Ontario Health Quality Council emphasized the importance of managing patient flow in the hospital system using operations management concepts such as queuing, smoothing and simulation (Ontario Health Quality Council, 2006). However, the report did not provide specific guidance on how to achieve these improvements.

The purpose of this article is to share the experiences of one acute care hospital

FIGURE 1.
ALC days per month – Juravinski site



In September 2007, changes to the interpretation of the alternative-level-of-care (ALC) patient placement policy significantly influenced the number of ALC patients remaining in acute hospital beds at Hamilton Health Sciences, in particular, the Juravinski (Henderson General) site.

as it made a concerted effort through a corporate initiative (CI) to improve patient throughput and quality of care despite competing demands and constrained resources. Organizational structures and specialized resources were employed to collect, analyze and use data in order to improve flow and access to care. The successes and lessons learned from this CI are summarized here and may provide useful insights to others.

The Juravinski Hospital Environment

The Juravinski Hospital (formerly Henderson General Hospital) opened in 1954 as a 322-bed hospital serving chronic and convalescing patients. The role of the hospital has evolved to meet the general medical and surgical needs of the Hamilton mountain community and to be a major site for joint replacement surgery and cancer care, in association with the Juravinski Cancer Centre.

Patient flow was already a serious issue for the hospital during the summer of 2007 (Figure 1) but became worse in September 2007, when changes were made in the interpretation of the Ontario provincial regulations on priority placement of patients into long-term care facilities. This resulted in a rapid rise in the number of patients occupying acute care beds who were awaiting placement to alternative-level-of-care (ALC) environments.

The pressures created by this ALC policy change were accentuated by the decision to increase arthroplasty volumes in response to long wait times for joint replacement surgery. Cancelled surgeries due to no available bed were a concern as they posed a threat to achieving target volumes. The sharp increase in the ALC population coupled with the need to meet agreed incremental volumes for joint replacement and cancer surgeries created a perfect storm that manifested itself in high bed occupancy, long emergency department (ED) waits, the cancellation of scheduled care and high rates of off-service patients.

In an attempt to achieve the institution's goals, clinical managers participated in up to four bed-management meetings per day. The amount of time spent in daily bed-management activities impeded the institution's management team from pursuing proactive solutions to patient flow or advancing other important CIs. This negatively impacted the quality of work life for managers and front-line workers and threatened the recruitment and retention of valuable and scarce human resources.

The Hamilton Health Sciences Approach to Improving Patient Flow

The following section discusses how Hamilton Health Sciences (HHS) approached improving patient flow through the development and implementation of an Innovation and Learning (I and L) Initiative at the Juravinski Hospital site.

Establishing Quality Improvement in Patient Flow as a CI

In order to undertake a major hospital quality improvement

initiative focused on patient flow, the hospital leadership recognized the need to first understand the problem in sufficient detail that potential solutions could be identified, prioritized, implemented and evaluated. Dedicated time from the hospital's decision support analysts to synthesize data was required, as was the expert assistance of quality improvement specialists who could work with the clinical teams to implement change and monitor the impact of these changes. Significant decision support and quality improvement resources required a high level of commitment from the hospital's executive team and board, and this was achieved by making the initiative a CI.

The use of Define-PDSA throughout the I and L Initiative helped to build a culture of continuous quality improvement at the Juravinski site.

CIs are defined as initiatives with the potential to have an impact across more than two program areas. The Executive Team of HHS determines the number and types of CIs that it will undertake each year. Given the pressures from the increasing numbers of ALC patients and the need to maintain ED flow and optimize scheduled care, it became apparent that a focused effort on patient flow was needed. The endorsement by the executive team of the Patient Flow Innovation and Learning CI, as one of six CIs in 2007, was the first critical step in achieving change through process improvement.

Using the Hospital's Resources and Organizational Structure to Drive the CI

CIs require an executive sponsor as the most responsible person (MRP). Progress on all CIs is reported quarterly against milestones to the HHS Board, and executive compensation is, in part, based on achieving CI milestones. The executive lead for the Juravinski Hospital was the MRP for the I and L initiative and the individual with the overall responsibility for delivering on the initiative's goals and objectives.

Two senior leaders were identified to head up the initiative: the Juravinski site administrator, who brought expertise in overall hospital operations, and the Director of the Quality, Patient Safety and Clinical Resource Management (QPSCRM) Program, who set the vision and direction for the initiative and provided overall guidance on quality improvement.

Engaging the Key Stakeholders in the Initiative

Essential to the success of the Juravinski I and L Initiative was the engagement of senior administration, physician leaders, clinical managers and front-line staff. A Steering Committee was established composed of key representatives from these stakeholder groups, as well as formal and informal leaders from across the continuum of care and services. The committee established a project charter, prioritized the quality improvement initiatives and set 90-day milestones. The Steering Committee held two-hour meetings monthly, and full attendance at meetings was an expectation.

Juravinski site leaders were involved in sub-initiative work and spent up to four hours per week developing, testing and implementing quality improvement cycles. The Juravinski Bed Management Committee, composed of clinical managers, charge nurses, discharge planners and quality specialists, played an important role in implementing and monitoring many of the priority sub-initiatives, especially those related to synchronizing admissions, discharges and transfers. Daily bed-management meetings served as a vehicle for continuous communication, monitoring and real-time feedback on rapid tests of change.

Front-line staff were directly involved in project teams. In one case, the test of change was the implementation of an admissions nurse role on a surgical unit. A nurse was selected to trial the position full time for six months. In other cases, nurses participated in tests of change that typically required them to spend one to two hours learning about a new tool or process and 15–30 minutes daily using it.

Involving the QPSCRM Program

Through an organizational commitment to clinically appropriate and efficient resource use, expertise in quality improvement had been recruited and developed at HHS over a number of years. The QPSCRM program leadership and quality specialists possessed diverse backgrounds in nursing, allied health, engineering, statistics, data management, research methods and business administration. The QPSCRM program staff worked closely with the I and L Steering Committee and key stakeholders in identifying and testing new ideas and were engaged in data collection, analysis, interpretation and reporting as necessary to determine which changes to patient care processes and resources were likely to result in real improvements.

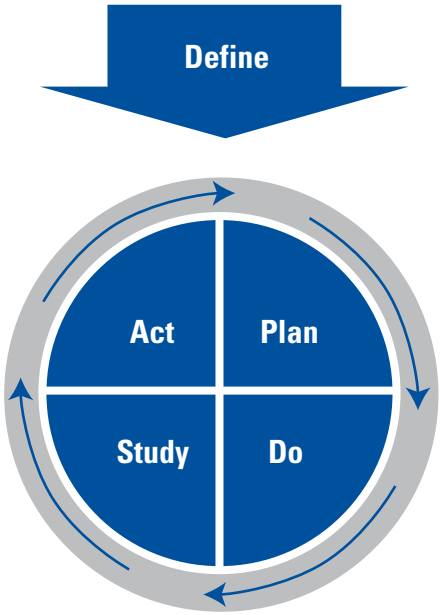
The skills of the QPSCRM program staff and stakeholders were enhanced by education sessions through the Institute for Healthcare Improvement (IHI) and by the training of QPSCRM program staff in green belt–level Lean and Six Sigma improvement methodologies. The QPSCRM program staff became coaches to stakeholders as they developed their own capacity to "fish for themselves," building and sustaining the culture of continuous quality improvement.

Standardizing the Approach to Quality Improvement

The change model used by the I and L Initiative was based on IHI's Model for Improvement, which in turn drew on earlier work by W. Edwards Deming and others (Deming 2000; Langley et al. 2009). HHS adapted the IHI model of Plan-Do-

Study-Act (PDSA) by adding a leading question to help "define" the impetus for each initiative. This model was adopted at HHS and used at all levels of the organization to plan and carry out all change and improvement initiatives.

FIGURE 2.
HHS model for change and quality improvement: Define-PDSA



Initiatives are launched by asking users to answer the following four "define" questions:

1. How do we know a problem or opportunity exists?
2. What are we trying to accomplish?
3. What changes can we make that will result in an improvement?
4. How will we know that a change is an improvement?

The Define-PDSA model is the HHS change and quality improvement model and was the main improvement methodology used in the I and L Initiative. The impact of each test of change was evaluated by a review of the data after a trial of the change process, and a conscious decision was made to do one of the following:

- Adopt the improvement as tested (the testing was completed in as many circumstances as required to demonstrate its usefulness)
- Adapt the improvement by making some additional changes to the process or tools
- Abandon the improvement plan if it was determined that it was not an appropriate strategy for the problem under study

The use of Define-PDSA throughout the I and L Initiative helped to build a culture of continuous quality improvement at the Juravinski site. As clinical managers and front-line staff developed expertise in quality improvement techniques, multiple PDSA cycles were conducted concurrently, which created a sense of energy that quality improvement in patient care was occurring. The executive lead, the Steering Committee members and project leads were visible and active in the review of the progress of each of the sub-initiatives. The use of this standardized approach not only enabled and encouraged change but also helped participants to transform how they thought about failed initiatives as they came to recognize that as much learning results from failures as from successes.

As the I and L Initiative matured, additional quality improvement tools were introduced to complement the Define-PDSA model. Lean tools such as value stream mapping, root-cause analysis and the identification of waste ("muda") in processes were used to explore the opportunities for improvement. Operations research techniques, such as discrete event simulation, were used to help understand flow, identify bottlenecks and test alternative solutions and processes to increase flow and alleviate bottlenecks.

Rigorous data analysis allowed team members to make informed decisions – through the use of histograms, run charts and control charts – on whether a test of change truly resulted in an improvement. Run charts and control charts were especially effective in delineating special cause variation from common cause variation. The latter is variation that occurs constantly in any process, in a predictable and stable manner. On the other hand, special cause variation is unexpected variation and can be attributed to a specific reason or event (Shewhart 1980; IHI 2010b; Wheeler and Chambers 1992). Control charts were used to focus on areas where a change could result in an improvement (special cause variation) and to avoid responding to situations that were unlikely to be effected by improvement efforts (common cause variation). Finally, an indicator report was developed to present monthly data on progress to the Steering Committee and to identify areas for further improvement work.

One metric of particular interest to the I and L team was IHI's bed-turn metric. This is calculated by dividing the number of budgeted beds by the number of separations (discharges) in a month, to produce a rate of separations per budgeted bed (IHI 2010b). This basic metric was useful, but members of the QPSCRM program customized the metric to make it more meaningful and actionable with regards to understanding patient flow. Since long-stay ALC patients existed on most in-patient units at the time of the I and L Initiative, a measurement was devised to show bed turns with ALC beds included (unadjusted) and

bed turns with the ALC factor removed (adjusted). Charts were created for each in-patient unit juxtaposing unadjusted bed turns to ALC-adjusted bed turns (Figure 3). Since discharge-related strategies to enhance patient flow for acute in-patient separations were different from those aimed at patients awaiting ALC placement, this metric allowed for the evaluation of these two distinct patient populations. Additionally, a "target corridor" of bed turns was devised from Canadian Institute for Health Information (CIHI) expected length of stay (ELOS) values, individualized for each unit's distinct patient population and charted monthly alongside the unit's unadjusted and ALC-adjusted bed-turn rate. Overall, the bed-turn metric developed through the I and L Initiative was found to be extremely valuable and continues to be used to monitor patient flow at the Juravinski site.

Providing the Education Required to Support the Initiative

In 2008, a quality education series began in which the senior consultant and a quality specialist supporting the initiative provided education sessions on quality improvement methodology and tools. Nine topic areas were covered:

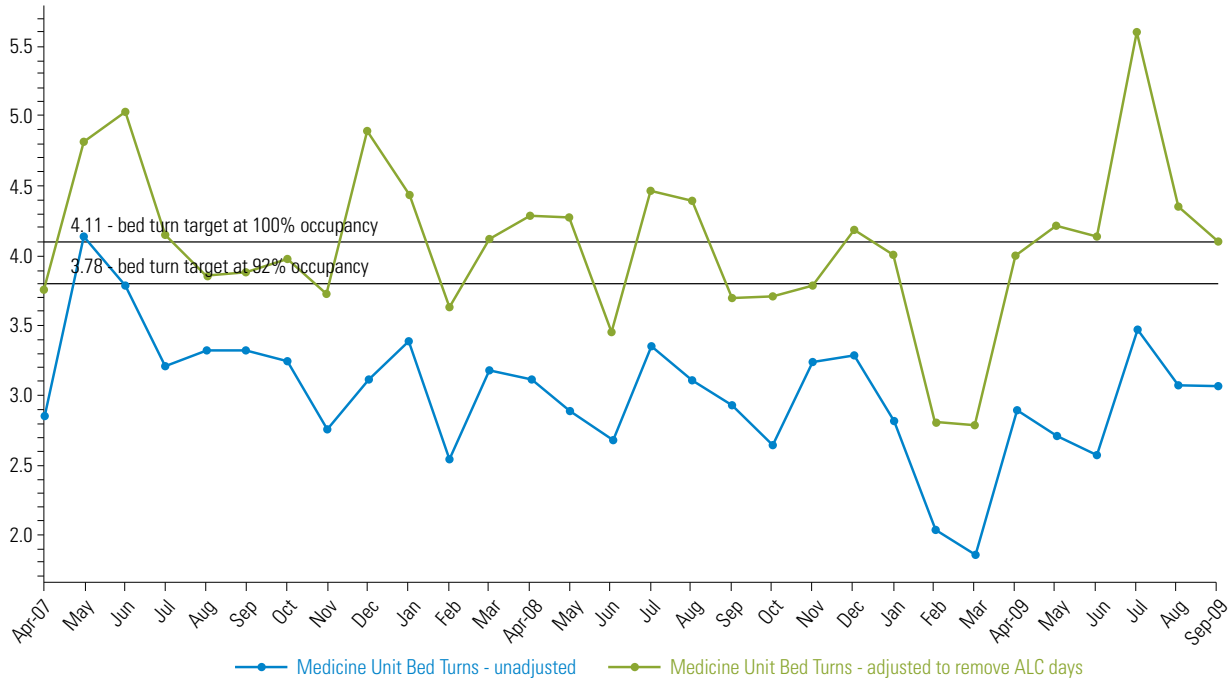
- IHI Model for Improvement
- Define-PDSA
- de Bono's "Six Thinking Hats" (de Bono 1985)
- Fishbone diagrams
- Pareto charts
- Measurement and analysis
- Lean methodology
- Process mapping
- 5 S's (sort, set in order, shine, standardize, sustain)

On average, 20 participants from the site, including front-line staff and leaders, attended each session. In total, 230 hours of instruction were provided to staff over a 10-month period and enabled participants to build a foundation of knowledge and expertise in quality improvement techniques.

Undertaking Tests of Change and Reporting on Results

A series of sub-initiatives were undertaken to enhance flow from the ED, avoid cancellations of scheduled care and facilitate regional access to tertiary care in the face of a high bed occupancy by ALC patients. Five themes emerged:

FIGURE 3.
Bed turns per month – Internal Medicine In-Patient Unit, Juravinski Site



For each in-patient unit, this indicator was developed to show the number of discharges per in-patient bed ("bed turns") compared with a target bed turn number specific to that unit's patient population. Also, monitoring unadjusted bed turns together with bed turns adjusted to remove ALC days allowed members to visually track the impact of ALC patient days on these units (the space between the blue and green lines) and tailor improvement initiatives effectively.

1. Matching demand with capacity: synchronizing admissions, discharges and transfers to allow improved access to care
2. Smoothing elective admissions through the development and application of simulation models
3. Improving access to critical care
4. Improving patient flow from the Juravinski Cancer Centre to the Juravinski Hospital
5. Sustaining quality through communication and building capacity for improvement

Over the course of three years (2006–2009), 31 quality improvement initiatives were tested (Figure 4 - please see http://www.longwoods.com/22452). Out of the 31 sub-initiatives, 28 were adapted or adopted at the site, for an implementation rate of 90%. In the three abandoned sub-initiatives, the lessons learned have helped to increase system knowledge and provided insight into other tests of change. Selected sub-initiatives are described below.

Examples of Successful Tests of Change

Smoothing Elective Admissions through the Development and Application of Simulation Models

To achieve the joint replacement volumes agreed to with the Ministry of Health, an initiative was undertaken to study the effect of queuing and smoothing elective arthroplasty admissions. IHI (2010a) has identified that significant improvement in patient flow can be achieved through smoothing elective admissions, as opposed to trying to control or mitigate against variation in demand of non-scheduled care.

In collaboration with the University of Toronto's Centre for Research in Healthcare Engineering, a discrete event simulation model of surgical patient flow was developed and tested. The model followed surgical patients moving through the hospital, from scheduling of their admission through to discharge. The model scheduled elective patients prior to surgery, handled the arrival and scheduling of emergent and urgent patients on a daily basis and made cancellation decisions due to no bed, overtime and other reasons. The model captured off-service surgical patients, the occupancy of surgical beds by off-service non-surgical patients and post-operative flow into the post-anaesthetic care unit, surgical wards and intensive care unit/cardiac care unit.

At first, only orthopedic patient flow was modelled to see if this would help to achieve the target joint replacement volumes and timely surgical management of hip fractures. The model was validated against historical data to ensure that it replicated the existing processes and outcomes. Once validated, the model was used as a decision tool to test a number of possible changes to the operating room (OR) block schedule and to evaluate outcome measures, essentially allowing for "virtual" PDSA cycles. Numerous adjustments to the orthopedic OR block allocation were tested, along with smoothing rules that dictated how many joint replacement procedures had to be scheduled per OR per day. The virtual PDSA tests resulted in an orthopedic block schedule and joint replacement scheduling rule that predicted the volume targets while reducing cancellations due to bed pressures. The model was also used to determine how best to reserve time for urgent fractured-hip cases within the elective schedule. The model has been used repeatedly since the initiative to update the schedule and to test other possible changes in target volume, OR availability and hospital resources. The schedule implemented in response to the simulation has been found to work as predicted except in times when the number of off-service patients in the orthopedic surgical beds far exceeds the historical rate modelled.

The simulation model was to be extended to include all surgical services. However, the time required to build, validate and test the orthopedic model was longer than planned, and many service and surgical personnel changes occurred during that time, making it difficult to get accurate input data on the other surgical services. Simulation modelling is a time-consuming activity and is reliable only when sufficient good data are available. However, the results from this study and others at HHS have proven that simulation is a worthwhile tool. HHS intends to adapt the model to the peri-operative services at the two other acute care sites in 2011 in an effort to smooth surgical scheduling across the organization.

The Bed Assignment Tool

The Bed Assignment Tool was designed as a "pull" strategy to help each in-patient unit anticipate and plan for the next day's demand for beds. Prior to the tool's development, it was generally felt that only the demand for scheduled care was predictable. This belief was changed through the presentation of historical ED activity, showing stable and predictable rates of ED admission by patient population and day of week. This information allowed us to advance the idea that it is possible for every in-patient unit to plan for and synchronize the next day's discharges (bed supply) and admissions (demand). In practice, the Bed Assignment Tool was created to enable this synchronization of activity. The completion of the tool by staff in the late afternoon or evening served multiple purposes:

- To support discharge planning by identifying those patients for whom day-ahead discharge planning work needed to be completed
- To heighten awareness of the need to "pull" the next patient up to the floor (i.e., admit the patient to a unit) from the ED
- To facilitate discussion at bed-management meetings

The Bed Assignment Tool continues to be used at the Juravinski site.

TABLE 1.
Indicator dashboard – I and L Initiative*

Outcome Measure	Historical Mean (Apr 06 – Mar 08 or Apr 07 to Mar 08)	Target Mean	New Mean (Apr 08 – Sep 09)	Status and Comments
Average time (h) from order to admit to depart ED	14.4 h	13.3 h	12.1 h	Target met and improvement from historic mean
Percent CTAS 1, 2 Depart ED within 8 hours	63.8%	66.9%	65.3%	Improvement from historic mean but did not meet target
Percent CTAS 3 Depart ED within 6 hours	70.3%	72.8%	72.1%	Improvement from historic mean but did not meet target
Percent CTAS 4, 5 Depart ED within 4 hours	81.4%	82.4%	79.4%	No improvement – worse than target and historic mean
Percent surgical cancellations due to no bed	1.9%	1.7%	1.1%	Target met and improvement from historic mean
Off-Service Rate (excluding ED days)	8.9%	8.0%	8.8%	No change from historic mean and did not meet target
ICU occupancy rate	94.6%	93.6%	94.5%	No change from historic mean and did not meet target

CTAS = Canadian Triage and Acuity Scale; ED = emergency department; ICU = intensive care unit.

*Some of the metrics followed during the I and L Initiative, showing point-of-time status and comparison to historical mean and target values.

Bed Mapping at the Juravinski Site

In the fall of 2006, it was questioned whether the site had the right number and allocation of beds for the patient population that it served. The Define-PDSA model was used, and a detailed analysis of bed use was undertaken using historical patient census days, stratified by case-mix group or physician service and specialty. The historical patterns of bed use were modelled and superimposed with targeted improvements. The revisions to the bed map were adopted in January 2007 with immediate and dramatic improvement in patient flow and off-service rates. Unfortunately, the improvements were largely negated by the changes to the interpretation of the ALC placement policy in the fall of 2007. Although the hospital experienced a sharp increase in ALC bed use (see Figure 1), the revised bed map and other quality improvement initiatives reduced the impact of the ALC challenge. The value of carrying out a bed-mapping analysis on an intermittent basis was made clear, and the Juravinski site has recently engaged in a further review of its bed map.

Site Status Communication Tool

The Site Status Communication Tool was developed as an electronic tool to provide a "snapshot" of bed status for HHS leaders immediately following the morning bed-management meetings. Specifically, the tool aimed to accomplish the following:

- Broadly communicate clear information from the daily bed-management meetings
- Enable discussion, follow-up and decision-making at subsequent bed-management meetings
- Anticipate what type of day it would be with regards to patient flow and facilitate a collaborative response to minimize bottlenecks affecting patient flow

The tool communicated site status with a stoplight system. Three status categories, red, yellow and green, were developed based on site-specific criteria. The tool's use was monitored for effectiveness using process and outcome measures related to the numbers of bed-management meetings called each day, surgical cancellations and when the ED was overwhelmed. The

tool requires managers to fill in six cells in an Excel file, which summarizes the current site status in only one to two minutes. This is then distributed electronically across the site. The Site Status Communication Tool continues to be used and has been further refined. It is currently being adapted for use at the other HHS acute care sites.

Measuring Progress

The I and L Committee in collaboration with the QPSCRM Program also established a stoplight system to track the progress of the I and L Initiative against historical controls. The outcomes selected were classified into three broad categories: access and flow, cultural change and patient and family satisfaction. In relation to access and flow, the key metrics included ED wait times by Canadian Triage and Acuity Scale (CTAS) status, admission rates, in-patient unit occupancy, surgical cancellation rates, off-service rates, conservable bed days and the average and expected lengths of stay for all in-patient units (Table 1).

Sustaining the Change

Recognizing how difficult it is to sustain a change in institutional culture, the Steering Committee focused on strategies to ensure that the new norms of working were maintained. There was a need to ensure that all staff working at the Juravinski site felt that they had an important role in improving patient care and flow, especially as the I and L Initiative was only supported as a CI for three years. The following were among the strategies employed to sustain the quality improvement culture:

- Maintaining two quality specialists at the Juravinski site
- Continuing educational initiatives for front-line staff on quality improvement techniques
- Continuing "just-in-time" consultation for anyone leading a quality improvement initiative

In addition, it was recognized that there was a need to hardwire a number of processes into standard practice. This was accomplished by the introduction of a monthly audit of the use of such tools as the Bed Assignment Tool, the Discharge Formula Tool and the Site Status Communication Tool. The chair of the Bed Management Committee was assigned the responsibility of overseeing these ongoing audits, which also included quarterly audits of the use of the express unit, same-day overnight stays and the bed-management policy. Three additional recommendations were made to ensure long-term sustainability:

1. Conduct a half-day workshop with clinical managers to review and revise unit leader and charge nurse role descriptions to include the expectation that tools designed to improve patient flow are continually used
2. Conduct a half-day workshop with clinical educators to ensure that appropriate information on the use of patient flow tools is included in the orientation manual for each in-patient unit
3. Provide ongoing infrastructure to maintain the OR simulation model

Communicating Successes

Apart from the regular communication of progress to the hospital executive and board through the quarterly reporting of the milestones achieved on the initiative, it was important to communicate successes of the project to the family of hospitals that make up HHS and beyond. Presentations were made to hospital directors at the Clinical Resource Utilization Management Steering Committee and at various site forums, including the Juravinski site executive and clinical managers meetings. A special effort was made to communicate to the HHS sister institutions by holding a full-day information fair called the Innovation Express. Built on an express train theme, complete with train tracks through the halls of the hospital, station stops consisted of display boards on individual sub-initiatives, presentations by the quality improvement initiative leaders and interactive demonstrations of specific improvement tools designed for use at the Juravinski Hospital. Staff from across HHS were invited to attend. This forum provided an opportunity to exchange information on the Juravinski Hospital's successes and for the other sites to pick and choose ideas that they might apply in their own facility. Posters were also presented at the Ontario Hospital Association HealthAchieve event annually during the time when the CI was in place.

Lessons Learned

The data demonstrate that the concerted effort of the I and L Initiative led to improvement in some but not all of the parameters that we hoped to improve. The successes that were gained were dependent on a number of critical success factors. Most of these are well recognized but are emphasized for the benefit of institutions that have not yet embarked on any major quality improvement initiatives. The first was the significant investment in building a foundation of expertise in data capture, analysis and management and in the information systems that enabled the data to be captured in an efficient way. It is essential to have either in-house expertise or external consultants in quality improvement. In-house expertise is a clear advantage as these individuals have knowledge not only of quality improvement approaches but also about the organization's strengths and weaknesses, including an understanding of the organizational culture and of the individuals within the organization who are key to enabling progress to be made. External consultants generally have a steep learning curve in relation to organizational dynamics and culture. None of these resources would have been available to us without the foresight of those who built this

expertise into the organization over time through the commitment of operating funds to create the QPSCRM Program.

The second key to success was the establishment of the patient flow initiative as a CI, which gave a very clear signal that the organization placed a high priority on this work. Furthermore, there were clear expectations that improvements would be made and that progress against milestones would be reported to the HHS Executive Team and Board. This high level of executive commitment was further supported by having a member of the executive team as the MRP for the project. This leadership was visible and participative.

A third success factor was the creation of a Steering Committee that was chaired by a respected senior administrator and involved all of the departments of the hospital that either had a direct or indirect impact on patient flow. Departments were represented by key leaders (physicians, directors and clinical managers) and by front-line workers. Front-line workers were extensively involved in the work of the sub-initiatives where the ideas were tested and evaluated. Much of the success that was achieved is attributable to the engagement and active participation of front-line workers in the initiative. In reality, if they had not helped to create the changes to improve patient flow, the changes would never have become sustainable.

A fourth critical success factor was the commitment to regular meetings of the Steering Committee (monthly) and to reporting to higher levels of the organization (quarterly). This created a sense of urgency on the one hand, while providing a regular forum to adjust the project plans, to re-prioritize objectives and, importantly, to celebrate the progress that was being made.

A fifth key factor was the knowledge and use of the tools of quality improvement and the gradual spread of their use throughout the organization. At this time, many of the departments now routinely approach problems by the application of the Define-PDSA cycle, even without the support of the HHS QPSCRM Program, and use tools such as value stream mapping. Each program area now has a quality council, and the reporting of performance and quality metrics is an integral part of departmental work. This is probably the true measure of our success as there is little real potential to permanently "fix" all the patient flow metrics given the increasing caseload and ever-changing medical practices. Rather, there is a need for an ongoing program of quality improvement. When an institution ingrains this culture of quality, it can use its past knowledge and present skills to face future challenges. HQ

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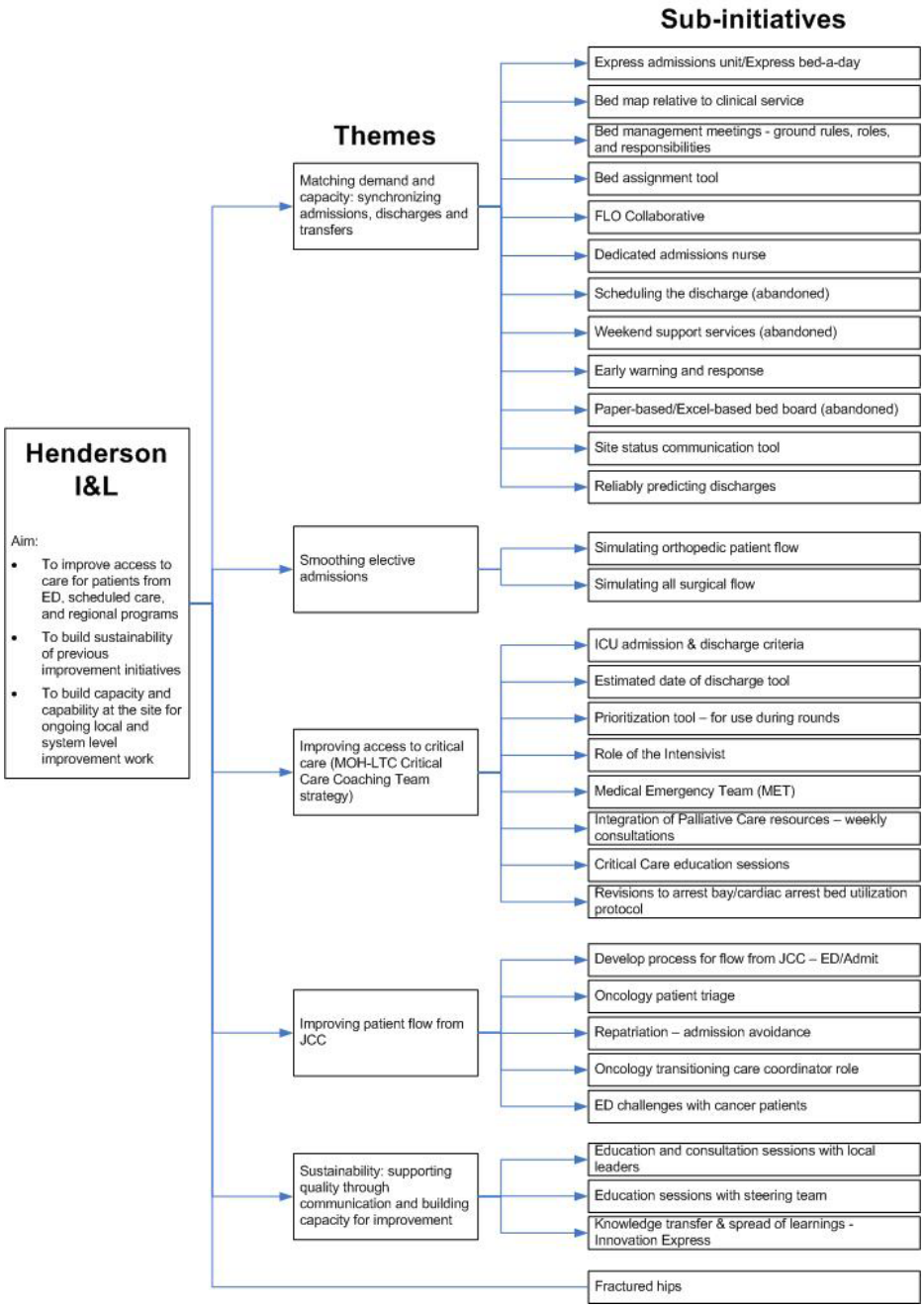
FIGURE 4.
Five themes and 31 tests of change under the I and L Initiative



ED = emergency department; FLO Collaborative= a provincial initiative to improve the processes of care required by a representative patient named Flo led by the Centre for Healthcare Quality Improvement; I and L = Innovation and Learning; ICU = intensive care unit; JCC = Juravinski Cancer Centre; ; MOH-LTC = Ministry of Health and Long-Term Care.