Small Changes Produce Large Gains in Efficiency: A Case Study from Ross Memorial Hospital

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Abstract
Healthcare is now more challenged to provide excellent care, while also increasing efficiency with more limited resources. The recent introduction of Ontario’s funding reform challenges hospitals to increase the efficiency of specific procedures by providing funding based on patient volumes. The cataract surgery program at Ross Memorial Hospital, in Lindsay, Ontario, is an example of how a program designed a few years ago with a focus on patient care and efficiency managed to become substantially more efficient by introducing a series of small changes.

Health System Funding Reform Drives Healthcare Quality
Recently, Ontario’s Health System Funding Reform (HSFR), which is playing an important part in the government’s drive to improve healthcare quality while ensuring fiscal sustainability, has begun to have an impact on cataract surgery (Ministry of Health and Long-Term Care 2012). Integral to HSFR are quality-based procedures (QBPs) and patient-based funding (PBF).

Quality-Based Procedures
The government used an evidence-based selection framework to develop the QBPs. The framework assessed procedures using practice variation, feasibility and/or infrastructure for change, cost impact and availability of evidence. Using these criteria, cataract surgery was identified as a QBP for which overall outcomes could be improved. Currently in Ontario, significant variation still exists in median wait times, although most local health integration network (LHIN) median wait times for cataract surgery fall below the provincial target of 182 days. As new technology has improved patient outcomes and reduced associated risks, demand for the procedure at lower levels of disability has increased. The annual cost of cataract surgery in Ontario before 2012 was more than $84.5 million (Ministry of Health and Long-Term Care 2012), and case-costing data indicate a significant cost variation between hospitals. Reduction in this variation has the potential to increase efficiency, decrease costs and create standards in Ontario.

Patient-Based Funding
PBF uses an evidence-informed approach to link funding directly to patient outcomes. Implementing evidence-informed funding for QBPs is designed to encourage the adoption of best practices and to maximize efficiency and effectiveness. PBF changes the focus from cost containment, as seen in funding allocated based on global budgets, to quality improvement. Desired outcomes include excellent surgical care, a streamlined and integrated process, better access to care throughout the province, shorter wait times and improved patient and family education about the procedure and post-operative care.

Funding, which is currently set at the cost of the 40th percentile ($497 per eye), will eventually become dependent on meeting evidence-based performance indicators. This approach is designed to encourage innovation, maximize the use of
operating room (OR) resources and optimize the patient experience. QBPs will have a varying impact on individual practices, depending on the clinical pathways and protocols in use and on variation from standard practice.

**Ross Memorial Hospital**

Ross Memorial Hospital (www.rmh.org), an active community general hospital, operates 174 beds and serves more than 80,000 residents in Lindsay, Ontario. This area, which is growing rapidly, has one of the highest concentrations of senior citizens in Canada (Statistics Canada 2006). In 2007, due to population growth and an increase in day surgery procedures creating unmanageable congestion, the hospital participated in a system improvement initiative developed by the Ministry of Health and Long-Term Care to assist hospitals in improving perioperative efficiency and performance (Sherrard et al. 2009). One result of this initiative was the opportunity to move cataract surgery out of the main OR suite into a self-contained Eye Centre.

**Creation of a Self-Contained Eye Program, 2008**

The surgical team visited other self-contained Ontario eye programs to learn about innovative space and program designs, aspects of which could be adapted to the Ross Memorial Hospital program (Tayfour 2006). The first step for the eye program team was to develop optimal processes and patient flow. One innovation was the use of a custom eye gel prepared by the hospital pharmacy that combines all topical ocular medications needed preoperatively in a single gel preparation: a local anaesthetic, an anti-inflammatory, an antibiotic, and three agents to dilate the pupil and paralyze the iris muscle to facilitate cataract extraction. This single application of medication is more convenient for patients; it also takes less time than the sequential administration of several eye drops, significantly increasing efficiency. Furthermore, as this gel provides better topical anaesthesia, less sedation is now required.

The team then tackled space management, designing an efficient OR in a small 1,465 square foot space. The self-contained eye suite now has its own entrance and preoperative area, a dedicated cataract surgery OR, an instrument flush area just off the OR, a recovery room, a holding area between the OR and recovery, space for laser treatments and a waiting and discharge area for surgery patients (Figure 1). The new Stellaris Vision Enhancement System was installed in the spring of 2008; it takes only seconds to set up, and it requires considerably less space than the previous system — an important advantage in the compact OR.

The creation of a dedicated eye suite in 2008 has had numerous benefits for Ross Memorial Hospital. It relieved significant congestion in the day-surgery area and created a substantial decrease in hospital time for patients. More efficient use of surgical time gained the surgeon, Dr. Lane, an extra half-day a week in the office. Efficiency and productivity were enhanced. In 2008, with approximately 20 cataract procedures a day, the changes brought visits from other hospitals to learn how this performance had been achieved. Wait times for cataract surgery steadily decreased. A critical element of this success in transforming the eye program and reducing cataract surgery wait times was giving the primary responsibility for designing the program and the use of space to the experienced front-line eye program staff.

**Innovation at Ross Memorial Hospital, 2012**

HSFR and the advent of PBF have prompted a new initiative at Ross Memorial Hospital to improve the efficiency of cataract surgery in 2012 even further and to ensure that the eye program remains viable at the hospital. At the same time, available cataract surgery time had been reduced from 2.5 to 1.5 days per week. Wait times range from 19 to 45 days, well within the LHIN target of 60 days. With the substantial increase in cases per day, the cost per case has decreased significantly, which has ensured that the eye program is still feasible with PBF of $497 per eye. An important success factor is that the eye program staff work together as a cohesive team and know each other's strengths. Says Brian Payne, the chief executive officer at Ross Memorial Hospital, “We recognize the vital importance of balancing patient safety and best clinical practice with financial target achievement. These changes have facilitated that balance, enabling the hospital to continue to provide its community with the very best in vision care services.”

The team began the efficiency initiative with a site visit to Windsor, Ontario. Changes made to increase efficiency affected all aspects of the procedure, from registration to discharge.
Volunteer Program
Volunteers now escort patients from registration at the hospital admitting area to the Eye Centre and then back after the procedure. This change means that family members now wait in hospital admitting, rather than in the Eye Centre waiting room, relieving congestion in the small preoperative space, thus allowing the nurses to work without interruption.

Preoperative Changes
Patients receive detailed instructions before their procedure so that they are well informed; they come prepared for their procedure. The relevant information is also on Dr. Lane’s website, so family members can inform themselves. Furthermore, patients receive a phone call from a preoperative nurse before surgery to review the process for the patient. These changes have made the admission process at the Eye Centre fast and smooth: preoperative instructions are reviewed, a brief customized admission questionnaire is administered, an intravenous line is inserted and the custom eye gel is administered to the operative eye. Previously, patients changed into gowns, which created congestion in the one washroom. Now, patients are simply instructed to wear a shirt that opens in the front, so that electrocardiogram (ECG) leads can be applied. This change saves both time and money. The OR assistant helps patients onto the stretcher, puts a cap on their hair and covers them with a blanket. In the preoperative area, a nurse applies a blood pressure cuff and the ECG leads so that, in the OR, the cuff and leads are simply plugged in.

Intra-operative Changes
The eye program switched from washable to disposable gowns for surgical staff. This allows the surgical gowns to be added to custom packs and decreases costs. Furthermore, a custom “prep” pack allows the surgeon to prepare for the next procedure immediately, without waiting for the scrub nurse, saving about two minutes per case.

The scrub nurse prepares for the case. The circulating nurse plugs in monitors, leads the safety checklist and conducts intra-operative charting. New abbreviated software designed specifically for intra-operative charting in cataract surgery streamlines data entry. Dr. Lane has an electronic medical record connection to his office server at the head of the patient bed to allow access to patient information. Macros are used for charting and real-time billing. The circulating nurse also prepares the phacoemulsification machine for each procedure. A third nurse sees the next the patient in the holding area to ensure the patient chart, consent forms and consult notes are complete. Also, this nurse applies the ECG leads and the blood pressure cuff, before preparing instrument carts for the following case. This nurse also flushes the dirty instruments at the end of each case, which allows the scrub nurse to move immediately to the following case, saving another two to three minutes per case. The instrument sets are then taken every hour automatically by the central processing department staff for sterilization, eliminating the need for OR staff to call them.

The whole OR team (surgeon, scrub nurse, circulating nurse and third nurse) stays together the entire day by taking two scheduled coffee breaks of 15 minutes and one 30-minute lunch break as a team. This avoids inefficiencies resulting from the previous system of individual breaks, which required team members to cover duties of people on break. This change alone significantly improved efficiency, saving several minutes per case. During the break, the preoperative team can admit and prepare more patients, preventing any delays due to patients not being ready for their procedure. The organized breaks also allow the surgeon to perform several laser treatments without affecting the OR schedule (approximately 20 laser treatments per day in addition to the cataract surgeries).

A new operating microscope provides more room at the head of the table, simplifying foot traffic in the sterile area.

Post-operative Changes
The changeover time between cases is now one to two minutes. The OR assistant cleans the room and helps position the patient for the next case. Post-operative charting is efficient, and the surgeon dictates a pre-templated note while the OR is being prepped for the next procedure. As anaesthesia now gives less sedation, this allows for faster patient recovery and eliminates a bottleneck in the recovery area. In addition, post-operative review of instructions is simplified by the detailed instructions patients receive preoperatively. A volunteer gives each patient juice and cookies and then escorts the patient back to meet a family member in admitting. Another small change that saves time is disposing of garbage at breaks and lunch rather than between every procedure.

Conclusion
The eye program team at Ross Memorial Hospital has met the challenge of PBF with innovations that have significantly increased efficiency, without additional resources. This surgery has been streamlined and simplified for patients and families, all while having no negative impact on patient care.

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References


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