

# Enhancing Surgical Care in BC

Improving Perioperative Quality, Efficiency, and Access



A Policy Paper by BC's Physicians | June 2011





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The BCMA Council on Health Economics and Policy (CHEP) reviews and formulates policy through the use of project-oriented groups of practicing physicians and professional staff.

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# Executive Summary

In this policy paper, the BC Medical Association (BCMA) proposes that a coordinated initiative to improve the quality, efficiency, and access to surgical care needs to be implemented across British Columbia. There are over 400,000 hospital-based surgical procedures performed each year in the province. The increasing demand for surgical care, a growing emphasis on the quality and safety of care, and the rising costs of delivering health services are driving the need for the health care system to improve the level and quality of surgical care while keeping health care expenditures in check.

The operating room (OR) and the processes that support the OR make up the perioperative system. A considerable amount of planning, preparation, and coordination within the perioperative system is required to ensure that patients receive quality surgical care that is safe and timely. However, quality and efficiency issues can cause surgical delays, cancellations, adverse events, and suboptimal care for surgical patients. These issues affect the experience and outcomes of surgical patients, the satisfaction of perioperative personnel, and the financial budgets of hospitals.

To address these issues, hospitals across Canada and in other countries have turned to concepts such as process improvement and system redesign initiatives to enhance the quality and efficiency of the surgical system. Perioperative personnel are being directly engaged. Surgeons, anesthesiologists, nurses, OR coordinators, and others can systematically examine where problems exist and develop solutions to reduce surgical delays and cancellations, eliminate adverse events, and improve the system for patients.

Individual hospitals in BC are beginning to apply process improvement methods to surgical care and other areas of the health care system with some promising results. The BCMA proposes that a provincial framework centered on the principle of continuous process improvement should be developed to support individual hospitals and surgical personnel to implement this initiative. In the spirit of process improvement, this needs to be an undertaking that engages perioperative personnel, is supported by senior management, and is ongoing and measurable—with institutions learning from each other's challenges and success.

The BCMA offers 12 recommendations on the design, implementation, and evaluation of performance improvement in surgical care in BC. The following is a working summary, which synthesizes some of the recommendations into six concepts:

## ***Establish a Process Improvement Panel***

The Ministry of Health, through the Provincial Surgical Advisory Council (PSAC), should establish a multi-stakeholder Perioperative Improvement Panel (PIP) to develop a framework for implementing perioperative process improvement throughout the province. The panel will deliver a report, within six months of its initial meeting, which includes a guide and checklist to assess the efficiency, quality, and access to perioperative care in each hospital. The framework will identify high-level best practices and allow for innovative and effective methods in use to be added to the framework, which can be tailored to meet the needs and priorities of individual hospitals.

## ***Identify Clinical Champions***

Each health authority and hospital must identify clinical champions (e.g., surgeons, anesthesiologists, nurses) who will lead a multidisciplinary perioperative improvement team to initiate process improvement in individual hospitals across BC. This will be accomplished based on the provincial framework and assisted by a provincial implementation support unit. The intent of the provincial framework is not meant as a top-down approach, but to support perioperative personnel in each hospital to identify problems and to develop solutions that fit their situation and priorities.

### ***Establish Provincial Implementation Support***

The PSAC should establish a provincial implementation support unit that will work with each of the approximately 40 hospital surgical programs, as well as community surgical facilities in the province. The implementation unit will work collaboratively with the local perioperative improvement teams in each hospital to compare the practices and processes outlined in the framework with those of each facility and jointly develop an action plan. The implementation support unit will also note new processes or ideas used in individual hospitals that could be spread provincially. This body will subsequently review the experience and progress of each facility at an agreed-upon time.

### ***Measure Performance***

The PIP must develop standardized quality and efficiency performance indicators that will measure the effect of process improvement provincially. Perioperative performance indicators (e.g., turnover times between cases) will need to be measured before and after an improvement cycle, and will guide the local perioperative improvement teams as well as inform the implementation support unit and the PSAC. Indirect measurement of the local OR processes will also be encouraged by feedback from outcome measures such as the American College of Surgeon's National Surgical Quality Improvement Program (NSQIP) or from patient-reported outcome-measurement scores (PROMs).

### ***Involve Patients***

As recipients of surgical care, surgical patients must be included in perioperative performance improvement. Patient representation will be included in relevant venues (e.g., the Process Improvement Panel, health authority level).

### ***Maximize Utilization of Resources***

To maximize OR capacity in the province, a review of each health authority's policy concerning extended holiday and summer closures of ORs should be conducted to recapture unused OR time. This may be achievable by agreement of local perioperative personnel and through activity-based funding supported by the Health Services Purchasing Organization.

This initiative will require initial funding to support implementation. However, based on the experiences, best practices, and lessons learned from other jurisdictions, the initial investment required to support process improvement in BC hospitals can create dividends by improving quality and efficiency, decreasing cost, improving the experience and outcome of surgical patients, and enhancing staff satisfaction.

# Summary of Recommendations

## *General*

To improve communication, safety, and efficiency in the operating room, all surgical programs and OR team members across British Columbia hospitals should implement the surgical safety checklist and surgical briefings as standard practice. **(Recommendation 1)**

Health authorities and their hospitals should implement process improvement initiatives. Standardized performance indicators must be in place and used to measure performance before and after. **(Recommendation 2)**

## *Process Improvement Panel*

The Ministry of Health, through the Provincial Surgical Advisory Council (PSAC), should establish a multi-stakeholder Perioperative Improvement Panel (PIP) that will, within six months of its initial meeting, develop a report with a provincial framework for improving surgical quality, efficiency, and access in hospitals across BC. **(Recommendation 3)**

The PSAC should oversee the implementation of the provincial framework and ensure that process improvement projects undertaken by health authorities and hospitals are coordinated and integrated within the framework. **(Recommendation 4)**

## *Clinical Champions*

Health authorities and hospitals must identify and support clinical champions to lead multidisciplinary perioperative improvement teams at each hospital. Support should enable the perioperative improvement teams to make relevant changes based on local needs and priorities. **(Recommendation 5)**

## *Provincial Implementation Support*

To aid the implementation of the provincial framework, the PSAC should establish an implementation support unit to assist hospitals and the perioperative improvement teams. The implementation unit can work with hospitals and community surgical facilities to assess their surgical programs and develop action plans to improve their perioperative processes based on best practices identified by the PIP. **(Recommendation 8)**

Health authorities should work with the Ministry of Health and the BCMA at the Specialist Services Committee (SSC) to identify how SSC funding can be used to help support physicians who wish to learn about process improvement methodologies and who want to participate in perioperative process improvement initiatives. **(Recommendation 6)**

## *Patient Involvement*

Patient representatives should be engaged as partners in initiatives to improve surgical care by participating on the provincial PIP as well as on committees at the local hospital level and the regional health authority level. **(Recommendation 7)**

## ***Performance Measurement***

The PIP should develop or adopt existing standardized indicators and benchmarks that can track and measure both perioperative efficiency and quality performance in all surgical programs across the province. Using provincial benchmarks, individual hospitals should establish performance targets, track their progress through the collection of performance indicators, and make continued improvements against those targets. **(Recommendation 9)**

The Ministry of Health should work with health authorities to incorporate the reporting of standard perioperative quality and efficiency performance indicators in the annual performance accountability agreements between the Ministry and individual health authorities. Where appropriate, public reporting on overall performance is encouraged. **(Recommendation 10)**

The provincial perioperative improvement framework must include an evaluation component to measure whether the provincial initiative is successful at improving the quality and efficiency of perioperative services at the level of individual hospitals as well as at a provincial level. **(Recommendation 11)**

## ***Maximize Utilization of Resources***

Health authorities and hospitals should consistently re-examine how seasonal OR closures can be shortened. Currently unused or underutilized operating rooms should also be examined as options for increasing access and efficiency. **(Recommendation 12)**

# Introduction

*Factors such as the increasing demand for surgical care and improved access, a growing emphasis on the quality and safety of care, and the rising costs of delivering surgical care are driving the need to further improve the delivery of surgical services.*

## ***Increasing demand for surgical services and improved access***

- The demand for surgical services is driven by a growing and aging population and by the introduction of new procedures and technical advancements, which have resulted in more people being candidates for surgery (Hurst & Siciliani, 2003).

## ***Growing emphasis on quality and safety of surgical care***

- The Safe Surgery Saves Lives initiative (World Health Organization), the Five Million Lives campaign (Institute for Healthcare Improvement), and the Safer Health Care Now! initiative (Canadian Patient Safety Institute) all represent a movement toward enhancing quality and safety in surgical practice (e.g., reducing risk, adverse events, and medical errors) (Polk, 2006).

## ***Pressure on health care expenditures***

- Overall health care spending in Canada is rising. Hospital expenditures continue to make up the largest component of that spending, accounting for 28% (\$48.1 billion) in 2008 (Canadian Institute for Health Information, 2010). As a result, health authorities managing hospital global budgets are under pressure to limit the growth of those expenditures.

Faced with the pressure to increase the level and quality of surgical care, while keeping expenditures in check, the health system is beginning to turn to process improvement initiatives, such as Lean, Six Sigma, and other standardized methods of operational analysis to evaluate, redesign, and enhance the quality and efficiency of the surgical care system (Archer & Macario, 2006).

The purpose of this policy paper is to review the common and systemic challenges that affect the quality and efficiency of surgical care (Part 1); identify how process improvement initiatives have improved surgical services in hospitals (Part 2); present how other jurisdictions have implemented initiatives to improve surgical care (Part 3); and identify key success factors for how the quality, efficiency, and access to surgical care in British Columbia can be improved in a coordinated manner (Part 4).

This policy paper recommends that a province-wide approach to perioperative process improvement, coordinated through the Provincial Surgical Advisory Council, is needed to enhance patient care and maximize the effective, efficient and innovative use of surgical resources in BC. These recommendations are guided by the Triple Aim principles of the Institute for Health Improvement (IHI) :

- Improving the health of the population.
- Enhancing the patient experience of care (including quality, access, and reliability).
- Reducing, or at least controlling, the per capita cost of care.

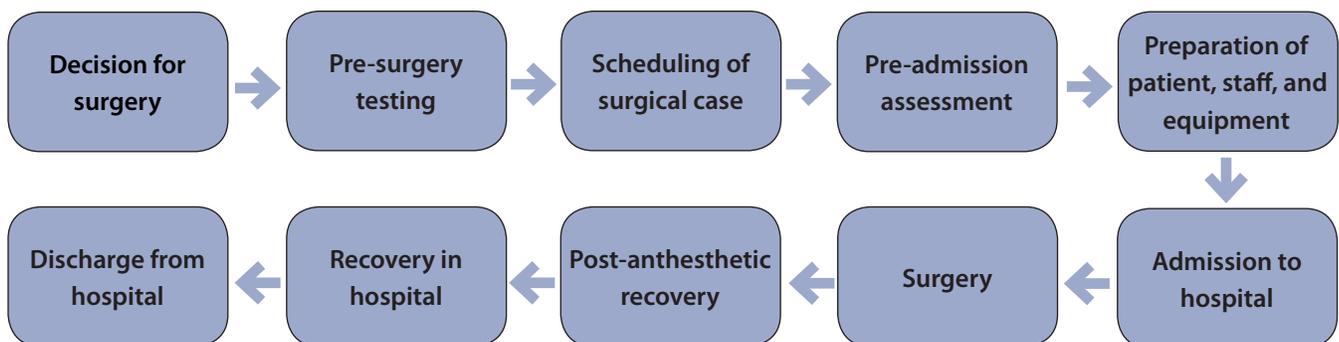
# Part 1: Working with the Perioperative Process

## I. An Overview of the Perioperative Process

The perioperative system involves both the operating room and the entire system that supports it. For the purpose of this paper, the perioperative portion of a patient's surgical care begins once a decision has been made for a patient to undergo surgery. During the preoperative phase, the surgeon and hospital prepare the patient and the resources required to deliver the surgical care. This is followed by the operative phase, when surgery is performed in the operating room. The postoperative phase is the period after surgery is completed, and includes patient recovery and discharge from hospital. (Exhibit 1 illustrates the perioperative process.)

From the patient's perspective, the journey through each phase of surgical care should flow seamlessly. However, many factors along the continuum of patient care can affect surgical quality and efficiency, as well as the patient's overall experience. These factors, along with initiatives to improve the overall perioperative process, are discussed below.

**Exhibit 1. The Perioperative Process**



## II. Defining Perioperative Efficiency and Quality

Archer and Marcario (2006) explain that the definition of perioperative efficiency depends on perspective. The various perspectives of the organization, provider, and patient regarding efficiency include:

- Scheduling efficiency (optimizing resources assigned to the operating room).
- Financial efficiency (reducing cost per case).
- Operational efficiency (overall system efficiency, which requires work process redesign).
- Practitioner-centred efficiency (maximizing surgical cases that can be performed).
- Patient-centred efficiency (providing interventions only when necessary, and providing a smooth patient flow with no unnecessary waiting).

The Institute of Medicine describes quality in health care as having six domains (safe, effective, patient-centred, timely, efficient and equitable), whereby efficiency is one domain of quality (Committee on Quality of Health Care in America, 2001). The objectives of achieving efficiency and quality are complementary: increased efficiency results in higher quality, and higher quality can result in greater efficiency. For example, when processes are standardized (efficiency), the potential for variation and errors is reduced (quality) (Haynes et al., 2009). When the potential for postsurgical

infections is lowered, and better management of postsurgical pain and anesthetic recovery is provided (quality), the length of hospital stays is shortened and the cost of follow-up care is reduced (efficiency) (American College of Surgeons; Cohn, Rosborough, & Fernandez, 1997).

For the purposes of this paper, perioperative quality and efficiency are defined as follows:

**Perioperative quality** is ensuring that surgical patients obtain the best and safest level of surgical care, which includes a positive perioperative experience and good surgical outcomes (e.g., minimizing risk and surgical complications).

**Perioperative efficiency** is maximizing the number of surgical patients that can be served while ensuring a high level of quality and safety, and optimizing the amount of resources and related costs that are used within a defined budget.

### III. Factors Affecting Surgical Quality and Efficiency

A great amount of coordination within various hospital departments is required to ensure that the patient, providers, and the operating room (OR) are all appropriately prepared for surgery, and that the patient's surgery and recovery are successful. This includes scheduling patients for surgery, preparing the necessary surgical equipment and tools specific to the procedure, and coordinating with other departments external to the surgical program (e.g., laboratory and radiology departments, intensive care unit, ward, ambulatory care unit).

Within the perioperative system, process bottlenecks and breakdowns, and issues affecting quality can occur. When problems in one phase occur, they can affect the other phases, which in turn can cause delays, case cancellations, and complications in care. Compounding factors include a shortage of OR resources, a lack of available postsurgical beds, and limited resources to support patients after they are discharged. All have an impact on the perioperative experience and health outcomes of patients.

This first section of this paper identifies some of the problematic areas within the perioperative care continuum and discusses where improvements to surgical quality, safety, and efficiency can be made.

#### ***Preoperative Phase***

##### *Operating Room Scheduling*

The role of the OR scheduling department is to coordinate and control the efficient flow of surgical cases in the hospital. Scheduling can be a significant factor in the success of the patient's surgical journey, and scheduling decisions can directly affect the number of patients who are able to obtain surgery and the overall performance of the perioperative system (Santibanez, Begen, & Atkins, 2007).

Many scheduling problems and inefficiencies are caused by inadequate preparation, planning, and coordination between the various multidisciplinary stakeholders, including the OR manager, scheduling department, surgeons, and nurses (Plasters, Seagull, & Xiao, 2003). Inadequate or inaccurate information to inform scheduling is another cause, particularly when such decisions are not evidence-based (e.g., no accurate tracking of actual start times of surgery, duration of the procedure, delays). A 2005 survey conducted of 120 hospitals in Ontario showed that 30% of

hospitals did not have a system for sequencing patients for the surgical day (e.g., grouping surgical cases that have similar procedures, or sequencing based on priority). As well, a considerable number of hospitals did not track surgical performance indicators such as surgical delays and surgical cancellations (Surgical Process Analysis and Improvement Expert Panel, 2005).

By its nature, emergency surgery is unplanned, and therefore it is often not factored into the daytime OR schedule. In critical life or limb cases, emergency surgery can bump a scheduled case. However, emergency procedures often have to be performed after-hours so as not to disrupt the scheduled cases that were planned in advance. A high prevalence of after-hours surgery can result in physicians and nurses being stressed, fatigued, and sleep deprived, which can result in poor patient care and a higher incidence of medical errors (Lockley et al., 2007; Maclellan, 2010). While emergency procedures are unplanned, it is possible to track and predict the timing and demand for emergency surgery. This can aid in planning so that emergency cases can be treated at the most appropriate time, whether it be daytime or after hours (State of Victoria, 2010).

There will always be times when unforeseeable difficulties arise, but overall the scheduling process can be made more efficient and effective with better preparation and planning and the timely use of information, and by reducing the variability in scheduling.

#### *Estimating Case Duration*

Scheduling cases to ensure a smooth day in the OR requires an accurate estimate of how long each surgical case will take (case duration), and then assigning OR time and resources appropriately. Case duration is defined as the time from when a patient enters the OR until he or she leaves the OR (Dexter, Macario, Epstein, & Ledolter, 2005). How long each surgical case takes depends on many factors such as the patient's condition, the type of anesthesia required, the type of surgery and special equipment requirements, and the skill and performance of particular anesthesiologists, surgeons, and nurses (Strum, Sampson, May, & Vargas, 2000). However, these factors may not be accurately accounted for if a hospital does not have an appropriate OR information management system in place. Scheduling systems that rely only on historical practice, individual judgment, or incomplete information—instead of evidence-based method—will limit the accuracy of OR scheduling and result in suboptimal use of resources and greater costs (Eijkemans et al., 2010).

When the actual duration of surgical cases does not match the estimated duration, both OR workflow and staff costs are negatively affected. This can often cause subsequent cases scheduled for that OR to be delayed, additional labor costs for overtime to be incurred at the end of the day, or the last case of the day to be canceled (Healthcare Financial Management Association, 2003).

A study of 42 hospitals in BC by Sullivan Healthcare Consulting (2005) found that only half of all cases were completed within the estimated time scheduled. This large differential between what is planned and what actually occurs makes it extremely difficult to effectively schedule patients and drives higher cancellation rates. It also makes it hard for staff to plan their daily schedule. Sullivan recommends a target duration accuracy rate of 90% as being appropriate for scheduling efficiency.

One other important factor is the presence of learners in the OR. The training of new surgeons is critical for enhancing their skills and experience, yet several studies have shown an association between the presence of surgical residents in the OR and increased procedure time and cost (Babineau et al., 2004; Opit, Collins, & Campbell, 1991; Sampath et al., 2007). Greater consideration will need to be made to account for the impact of training surgical residents, especially

with the expansion of medical school and surgical residency programs throughout BC.

### *Pre-Admission Screening and Assessment*

Effective pre-admission screening and assessment of patients is critical to optimizing the proper planning and progression of patient care (Livingstone, Harvey, Kitchin, Shah, & Wastell, 1993). Patients need to be screened as suitable for anesthesia and be ready and fit for surgery by having all necessary tests completed and identifying and arranging for any specific surgical and post-op requirements. When these steps are not taken far enough in advance of the surgery date, or if some patients are missed, problems can occur. If the information required to provide proper care for surgical patients is not consistently identified at this stage or transferred along the continuum of care (e.g., medication allergies; specific equipment, supplies, or operating room requirements; postoperative care requirements such as a critical care bed; special discharge planning or care needs), the result may be a postponement of the surgery or suboptimal care being provided later in the perioperative process.

### ***Operative Phase***

While there is no published formal data on true OR cost (Macario, 2010b), one study estimates it to be between \$600 to \$1,800 per hour excluding physician costs (Sandberg et al., 2005). Clearly, delays or other problems that occur on the day of surgery are costly. Problems such as late starts at the beginning of the day, surgical cases taking more or less time than anticipated, and slow turnover of the operating room between cases can lead to ORs not being utilized as originally scheduled.

#### *Delay in the First Case of the Day*

The delays in starting the first case of the day is a familiar topic of discussion and a general source of irritation for OR staff and managers (Masursky, Dexter, Isaacson, & Nussmeier, 2011). In one prospective study that evaluated the causes of operating room delays in an academic hospital, a disproportionate number of delays (55%) were found to occur during the first case of the day. In this particular institution, the delays involved personnel unavailability, delayed patient registration and transportation, and congestion in staging areas (Overdyk, Harvey, Fishman, & Shippey, 1998).

The 2005 Sullivan study found that, on average, 51 operating rooms in BC started at least 15 minutes late every day. On-time starts for the first case of the day ranged considerably, from 33% to 90%. The overall weighted average for on-time starts was 65%, whereas the recommended target is 95% to 100%.

Starting the day late can make staff rush and cause undue stress, particularly in busy ORs with many scheduled cases. Rushing has been identified as a factor that leads to an unsafe working environment and a cause of errors (Greenberg et al., 2006).

#### *Operating Room Utilization*

A common measure of efficiency relates to whether OR staff assigned to operating rooms are underutilized or overutilized. An OR is considered underutilized when operating room time is staffed but not used for surgery, setup, or cleanup, which can occur if cases finish earlier than scheduled for the day, there are prolonged delays between cases, or a case is canceled at the last minute. These situations can result in suboptimal use of staff. An OR is considered overutilized when it is staffed at overtime wages, which can occur when the last case of the day runs over the allocated time and staff must work overtime hours to complete it (Macario, 2007).

The Sullivan study (2005) reported that, on average, the 171 operating rooms that were open for surgery between 8:00 a.m. and 3:00 p.m. were 88% utilized (82% for small community and 95% for complex/teaching facilities) above the recommended target of 85%.

Both underutilization and overutilization of ORs are considered an inefficient use of resources: the former may result in wasted resources and the latter may result in additional overtime cost and reduced staff morale. Efficiency can be improved by minimizing the additional costs of cases running late and the opportunity costs of paying idle staff (Archer & Macario, 2006; Dexter & Traub, 2002; Strum, Vargas, May, & Bashein, 1997). While a few hours of under- or overutilization of OR resources each day may not seem significant, cumulatively they can have a considerable impact on the perioperative budget and can affect the overall number of surgical cases performed each year.

### *Turnover Time and Delays Between Cases*

Turnover refers to the time from one patient exiting an OR until the next patient enters the same OR; it includes the time required to clean up from the previous case and to set up for the next case (Donham, 1998). As with the surgery itself, variations in turnover time can influence whether the OR finishes on time at the end of the day, and whether the last case of the day proceeds or gets canceled. Some of the causes for long turnover times and delays between cases include:

- Lack of communication and coordination of events at the time of room turnover.
- Bottlenecks that inevitably occur during peak turnover times (e.g., in the middle of the day).
- Staff leave the OR for other duties or breaks and do not return on time for the next case.
- Changeover from one surgeon to another in between cases when the OR is assigned to more than one surgeon in a particular day.

### *Operating Room Staff Communication and Teamwork*

The level of teamwork and communication in the operating room and within the hospital is an important factor that affects perioperative efficiency, quality, and safety. When breakdowns in teamwork and communication between members of the OR team occur, there are more adverse events such as surgical delays, wrong-site surgery, and overlooked allergies (Mazzocco et al., 2009; Nilsson, Lindberget, Gupta, & Vegfors, 2010; Sexton et al., 2006).

One study in an Ontario hospital found that communication failures occurred in approximately 30% of the time information was exchanged among OR team members. Examples included incomplete or inaccurate information exchange, issues being left unresolved until the point of urgency, and key individuals within the OR team being excluded from discussions and decisions. Thirty-six percent of communication failures resulted in system process inefficiency, team tension, resource waste, workaround, delay, patient inconvenience, and procedural error (Lingard et al., 2004).

### *Postoperative Phase*

The organization and flow of postoperative care likewise affects the patient's pace of recovery and length of stay. Access to postoperative beds and nursing care, handover of patients from the operating room into recovery units, and discharge of patients all influence postoperative efficiency and quality of care.

### *Access to Postoperative Beds and Resources*

The first part of the postoperative recovery process occurs in the postanesthesia care unit (PACU), which is often a busy environment and may be overwhelmed if a large number of surgical patients enter the recovery area within a short period of time. An overstretched PACU can affect the level of care that nursing staff are able to provide, including appropriate pain management or dealing with potential postoperative complications. The result of the PACU being full or nurses not being able to accept new patients promptly may be a backup in the OR—because patients and OR staff have to wait in the OR itself for an available bed or nurse. Consequently, OR staff are not able to set up and start the next case (Calmes & Shusterich, 1992). Such bottlenecks can result in the cancellation of subsequent scheduled cases.

Further backlogs can occur if patients are delayed from being transferred out of the PACU to an open ward bed. One tertiary care academic hospital in Quebec found that 76% of patients were delayed in being transferred out of the PACU, slowing down the perioperative flow. The identified system problems (e.g., PACU orderly too busy, patient waiting for assessment by anesthesiologist, PACU nurse being too busy to transfer patient, receiving ward nurses not ready to receive patient or no bed available, patient waiting the interpretation of an X-ray or other test) are all issues that should be correctable with appropriate management processes (Tessler, Mitmaker, Wahba, & Covert, 1999).

Finally, the unavailability of appropriate ward beds and the inappropriate placement of patients into non-surgical wards can also hinder the provision of quality care (e.g., adult orthopedic patient is placed in a medical or pediatric ward, where staff may not be familiar with postsurgical care requirements and considerations).

### *Patient Handover*

Effective handover of surgical patients and information from the preoperative and operative phases to the postoperative phase is critical to a smooth and safe surgical pathway. Because this process for handing patients over involves various staff across different units and is often done in a non-systematized manner, it is particularly vulnerable to an incomplete transfer of information (Fowler, Craig, Fredendall, & Damali, 2008). If critical information or instructions are not accurately conveyed to the postoperative staff, once again potential problems such as medication errors and allergic reactions can result.

### *Discharge Planning*

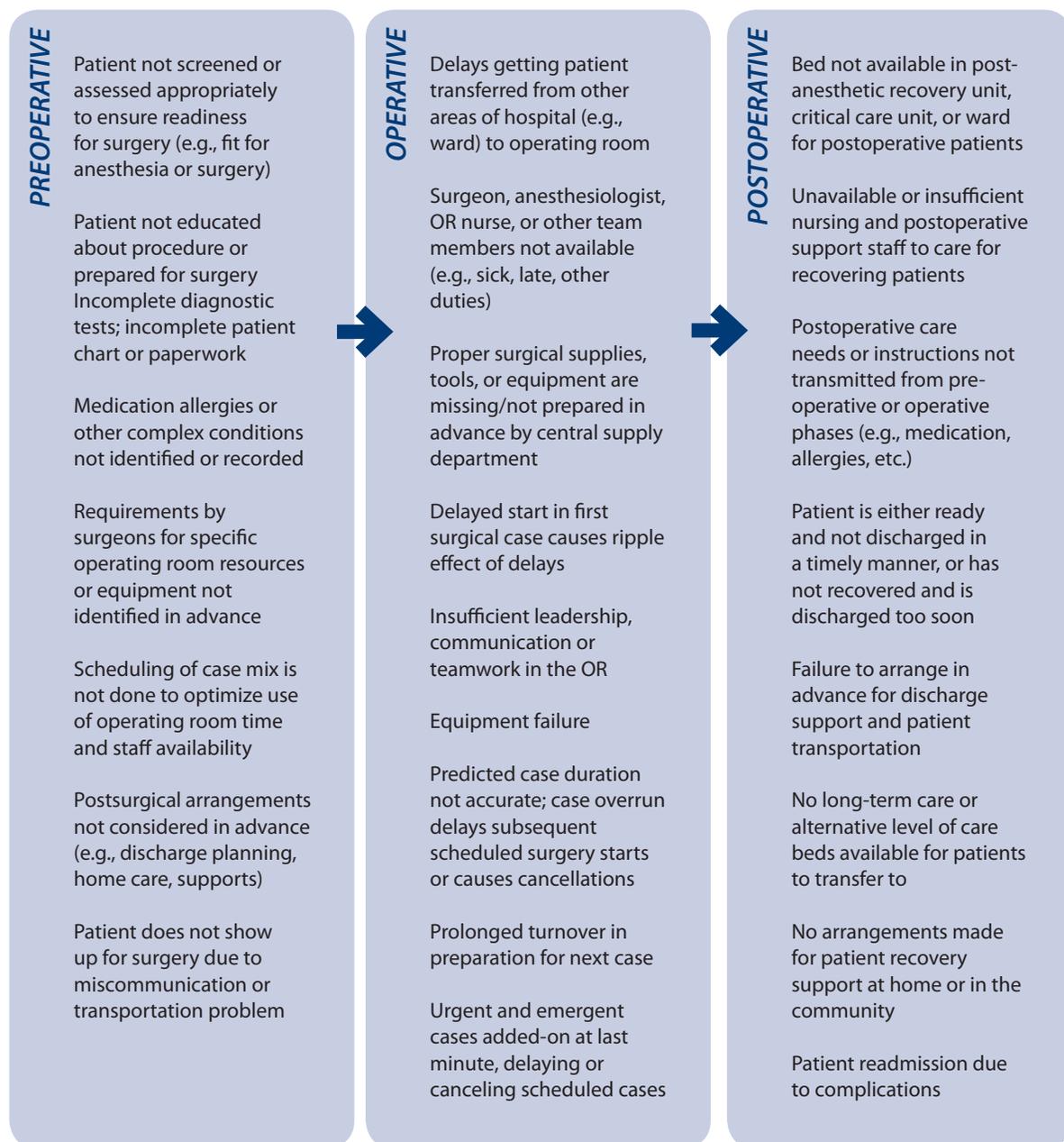
Identifying and planning for the surgical patient's postoperative discharge needs early in the perioperative process can help patient flow and care at the time of discharge. Transportation needs, family or caregiver assistance, arrangements for multidisciplinary care follow-up, rehabilitation in the community, and homecare supports all require coordination and planning in advance of surgery, but are often not adequately planned for in advance. An Ontario report identified this as a significant problem where 51% of hospitals did not coordinate postoperative services prior to surgery (Surgical Process Analysis and Improvement Expert Panel, 2005). Without this advance planning, sub-optimal quality of care and potentially poor patient outcomes can occur, especially if necessary rehabilitation services are not available. Similar to delays in transferring patients out of PACU, delays in discharging patients who are ready to leave can potentially affect the perioperative flow.

## IV. Common Perioperative Problems

The concerns that have been identified are not unique to the hospitals that have been studied. Most hospitals across Canada and in other jurisdictions face comparable challenges to their perioperative programs, regardless of whether the hospital is a large tertiary academic teaching centre or a smaller community hospital. The scope of the issues may vary, but most have similar challenges such as patient flow bottlenecks and communication breakdowns (Sherrard, Trypuc, & Hudson, 2009).

Some of the common perioperative problems that have been observed are summarized in Exhibit 2.

**Exhibit 2. Common Perioperative Problems**



## V. The Case for Improving the Perioperative System

Many of the problems identified along the surgical care continuum that impede the efficient flow of patients and cause quality of care defects can be attributed to systemic problems within the hospital's organizational structure and culture. This includes departments operating in administrative silos, unaligned system incentives (e.g., individual members of the OR team and hospital staff driven by different motivations, incentives, and modes of remuneration), and unclear lines of responsibility and accountability (e.g., the ability to shift blame or responsibility to others for delays and problems) (Calmes & Shusterich, 1992; Cleary, 2003). Perioperative staff are professionals who are dedicated, skilled, and driven to provide quality surgical care. However, when individual departments do not work collaboratively and are not accountable for the patient's overall surgical journey, fragmented care can result.

In a focus group of former surgical patients conducted for the BCMA by the Patient Voices Network (ImpactBC) in February 2011, participants identified poor continuity of care and inadequate communication between patients and the various providers along the patient journey as critical concerns. In some cases, poor preoperative preparation and coordination of care led to complications and adverse events postoperatively. From the patients' perspective, it is clear that there is room for improvement. (A summary report of the surgical patient focus group is provided in the Appendix.)

Perioperative problems are also a source of frustration and stress for staff, and can have a significant bearing on staff satisfaction and well-being. Persistent problems can ultimately affect staff recruitment and retention, particularly if there is a high level of staff burnout and turnover (Balch, Freischlag, & Shanafelt, 2009; Hyman et al., 2011; Shanafelt, 2011).

The challenge for hospitals is to meet the growing demand for surgical services and to improve the quality and efficiency of those services. While additional resources are still needed, simply expanding funding without transforming the system to make it work better for patients, providers, and hospitals will likely not result in the most effective or sustainable results.

Perioperative programs need to unlock hidden capacity within the current system by identifying and reducing the bottlenecks and process errors. Part 2 of this paper looks at how process improvement principles and tools can be used to help hospitals systematically evaluate their perioperative processes and develop solutions that achieve sustainable improvement.

## Part 2: Improving the Perioperative System

*Identifying waste in a health care organization is an approach that nearly all other industries use to look for inefficiencies and then identify ways to remove them and redesign processes to increase efficiency. By continuously looking for ways to reduce waste, leaders are continuously looking to improve value.*

*– Institute for Healthcare Improvement:  
Increasing Efficiency and Enhancing Value in Health Care (2009)*

### I. Process Improvement Methodologies

Over the past decade, many parts of the health care sector, including surgical programs, have begun demonstrating success using process improvement initiatives in several countries, including the United Kingdom, United States, Australia, and Canada (Fine, Golden, Hannam, & Morra, 2009). This is being done by using process improvement methodologies.

Process improvement is a general description of operational analysis methods used to identify, analyze, change, and improve existing processes within an organization. It is used to enhance efficiency and productivity by reducing system bottlenecks, minimizing unnecessary costs and steps, standardizing processes to reduce variation, and eliminating errors, all while also improving the quality of services for the patient. These actions often follow a specific and standardized approach, and are advanced by supporting perioperative personnel to learn and use process improvement methods to identify and remove unnecessary steps from their everyday work, and to develop sustainable solutions that improve the quality, safety, and efficiency of surgical services.

Originally developed for use in business or manufacturing, these process improvement methods and strategies have been successfully adapted for use in the health care sector (Fine, et al., 2009). Some of the common methodologies applied include Lean, Six Sigma, and the Model for Improvement. (A summary of these methodologies is provided in Exhibit 3.)

#### Exhibit 3. Summary of Process Improvement Methodologies

##### Lean

- A process management philosophy with two pillars: respect for people and the continuous pursuit of improvement (Caesar, Chouhan, & Ko, 2008).
- Emphasis is on delivering services efficiently by eliminating waste or non-value added components (e.g., unnecessary steps, time, effort, cost), so that all work adds value and serves the needs of the patient.
- The framework used in Lean includes:
  - Identifying the value-creating steps in any process.
  - Focusing on eliminating waste in the system.
  - Empowering those who do the work in continuous improvement.
  - Focusing on the patient in the pursuit of perfection.
  - Defining and standardizing processes to reduce variation and error.
  - Emphasizing data as the driver of change (i.e., data influences behavior).
- Lean process analysis tools (e.g., kaizen event, value stream mapping, 5S visual controls, workflow diagrams) are used to help perioperative staff observe, identify, and eliminate waste (Caldwell, Brexler, & Gillem, 2005).

## Six Sigma

- A project-driven management approach to improve an organization's products, services, and processes to reduce defects (i.e., errors) by continuously improving processes in the organization.
- Characterized by its patient-focused approach, with emphasis on decision making based on careful analysis of quantitative data (Antony & Banuelas, 2002).
- Employs five structured phases for problem solving: define, measure, analyze, improve, and control (DMAIC).
- While Lean focuses on reducing time and eliminating waste, Six Sigma focuses on reducing errors. The two methodologies are often combined in process improvement initiatives (De Koning, Verver, Van Den Heuvel, Bisgaard, & Does, 2006).

## Model for Improvement

- A structured tool to support learning and accelerate improvement (Langley, Nolan, Nolan, & Norman, 2009)
- The model is centred on addressing three questions when analyzing a problem:
  - Setting aims: What are we trying to accomplish?
  - Establishing measures: How will we know that a change is an improvement?
  - Selecting changes: What changes can we make that will result in improvement?
- Process improvement is done by using the Plan-Do-Study-Act (PDSA) cycle method, which tests a change in the real work setting by planning it, trying it, observing the results, and acting on what is learned.

While Lean, Six Sigma, Model for Improvement, and other variations of process improvement methodologies each offer different frameworks and tools, they all apply some form of standardized and rigorous approach to examining root problems, developing solutions, and measuring improvement. They all also share the principle that process improvement needs to be data-driven and evidence-based. Without the ability to track relevant information, it is difficult to identify problems or measure performance and improvement.

This policy paper does not advocate for the use of any particular process improvement model, but it does endorse the use of structured analytical approaches and the value of committing to continuous quality improvement. Ongoing learning and improvement is a key component within the IHI's Triple Aim strategy (Institute for Healthcare Improvement, 2009).

## II. Using Process Improvement Methodologies to Enhance the Perioperative System

This section identifies how hospitals are achieving process improvements in surgical care to enhance the patient experience and outcomes, increase staff satisfaction, and reduce operational costs.

### *Examining the Complete Perioperative Process*

All process improvement methodologies start by examining what is actually taking place within the organization and then analyzing in detail where problems exist along the entire continuum of the perioperative process. As the Healthcare Financial Management Association (2003) states, "when organizations are able to take a step back and look at the entire care-delivery process as a whole, by understanding how each step, each resource, each department is interconnected and interdependent, they can make leaps, not just steps, forward in improvement."

Process or value stream mapping are common tools for identifying areas that contribute to high-quality, safe, efficient and appropriate care, and areas that do not (e.g., prolonged waiting for patients and time wasted by staff performing non-value-added tasks) (Fairbanks, 2007). For example, hospitals across Ontario used a comprehensive standard self-assessment tool to identify the root causes of problems and areas needing improvement. The self-assessment tool has proved critical for educating perioperative teams as it forced staff to honestly evaluate their performance and provided an indicator of staff commitment to identifying issues (Sherrard, et al., 2009).

As process improvement methodologies must be data-driven and evidence-based, another important component is the collection of performance information. Without a thorough understanding of where changes need to be made, organizations will not be able to make reforms necessary to improve perioperative efficiency and quality (Healthcare Financial Management Association, 2003).

Once organizations have identified where they want to focus their attention, the next step is to develop and test potential solutions by using a structured, rapid process improvement method such as a kaizen event (a Lean term that defines a short-term project to improve a process) or the Plan-Do-Study-Act (PDSA) cycle. Done properly, multidisciplinary teams can quickly diagnose, design, test, and implement solutions (Caesar, et al., 2008). To ensure continued quality improvement, these processes are intended to be ongoing, not one-time events.

Many hospitals choose to start process improvement initiatives by focusing on one of several key service areas such as operating room scheduling, pre-admission clinics, supply chain management, operating room processes, postoperative care, or discharge planning.

## ***Preoperative Phase***

### *Operating Room Scheduling*

Effective operating room scheduling has been identified as one of the primary determinants of perioperative efficiency (Macario, 2007). A key solution includes evidence-based scheduling, which involves tracking actual procedure and turnaround times by individual anesthesiologists and surgeons, and by specific procedures to make scheduling more accurate (Strum, et al., 2000)

Some organizations use modeling software that can analyze various scenarios to determine the most optimal OR schedule. In one case, with the help of modeling software, a hospital was able to increase OR utilization by 10 percentage points (from 69% to 79%). Within eight months, the surgical program was able to accommodate 900 new surgical procedures a year without adding any operating rooms or hours (Terry, 2009).

Other scheduling solutions that can improve resource utilization and increase capacity and throughput include the following:

- Implementing an integrated electronic scheduling system to track OR performance (e.g., cancellation rates, room utilization, delays, and resource utilization) that links with other systems in material management, central processing, and staff scheduling. Such a system helps improve efficiency by allowing everyone to work from the same platform and have access to the same information.

- Developing a clear and transparent case prioritization protocol to schedule add-on emergent cases, and treating urgent cases as part of regular planned activities.
- Assigning dedicated ORs or “open slates” to accommodate anticipated urgent and emergency cases (e.g., orthopedic trauma, plastic surgery, general surgery) in busy major tertiary hospitals. This helps ensure such cases do not bump scheduled elective cases in other ORs, and also helps reduce the need for after-hours surgery by performing them during the day in the dedicated room (Bhattacharyya et al., 2006; Elder et al., 2005).
- Reserving capacity in elective surgery lists to allow flexibility in the schedule for expected emergency cases.

### *Clinical Pathways*

There is considerable evidence to suggest that clinical pathways lead to improvements in clinical care for surgical patients, as well as reduced hospitalization costs (Ronellenfitsch et al., 2008). The use of a clinical pathway combined with clinical judgment can help organize and facilitate a safe and smooth journey for patients. The tool is used to ensure that all the proper surgical patient care information is collected, and that all perioperative requirements and considerations, such as medication allergies and discharge planning needs, are taken into account prior to surgery. Reviewing the clinical pathway with patients also helps ensure that the patient and caregiver are fully informed and prepared for admission, operation, and discharge. In BC, effective clinical pathways for hips and knee replacement were developed as part of the Arthroplasty Plan (Hughes & Roberts, 2006).

Some clinical pathways are used throughout a jurisdiction to standardize the perioperative process and to reduce the potential for errors and missed information. For example, the state of Queensland in Australia uses a standardized state-wide clinical pathway for general surgery, day surgery, cholecystectomy, and hernia cases, and Saskatchewan uses a standardized province-wide pathway for hip and knee surgery (Queensland Government, 2010; Saskatchewan Ministry of Health, 2010b).

### *Pre-Admission Clinic*

An effective pre-admission clinic helps ensure that patients are properly prepared for surgery and that the post-surgical recovery and discharge considerations are planned in advance. Such planning reduces case cancellations and helps ensure patient safety and appropriate management of complex patients (Digner, 2007). The University Health Network (UHN) in Toronto found that their pre-admission consultation process was not streamlined, had excessive patient length of stay in the clinic (four to five hours), and underutilized clinic capacity. In response to these findings, UHN used process improvement to redesign the clinic, created a workflow that is patient-centric by having various staff go to patients in assigned consult rooms, staggered patient arrival times, and enhanced tracking of patient status. These changes reduced the pre-admission visit time from five hours to two, a 60% reduction (Caesar, et al., 2008).

The use of group appointments, where multiple patients are served at the same time in a group setting, has been demonstrated to improve access and productivity in busy office practices, and to enhance patient care when patients are able to learn and support each other (Noffsinger, 2009). A similar model could be explored for the pre-admission clinic to accommodate patients undergoing similar and higher-volume procedures. Part of the patient’s preadmission visit can include a group session where several patients can learn about their upcoming surgery at the same time and prepare for their postoperative care and discharge plan. By incorporating some form of group visit into their service, pre-admission clinics could potentially alleviate long wait times and serve more patients.

### *Supply Chain Management and Organization in the Operating Room*

Better management of purchasing and more efficient use of non-clinical supplies, medications, and clinical materials can lead to significant cost savings. This includes, for example, standardizing equipment and reducing the amount of unused and discarded supplies (Braithwaite; National Health Service, 2010; Surgical Process Analysis and Improvement Expert Panel, 2005)

The use of integrated OR management systems that link scheduling with electronic patient and anesthetic records, order entry for tests and pharmaceuticals, supply chain management, and other hospital-based information systems can also significantly improve efficiency and reduce errors (Australian Department of Health and Family Services, 1997; Randa, 2010; Saskatchewan Ministry of Health, 2010b).

Further, a well-organized OR is more efficient and safe. Using process improvement tools for the OR such as 5S (sort, set, shine, standardize, and sustain) can help ensure that the right equipment and consumables in the right place at the right time (National Health Service, 2010).

## **Operative Phase**

### *On-Time Starts in the Operating Room*

Because a late start in the OR at the beginning of the day can affect the schedule for the rest of the day, many hospitals have chosen to work on ensuring that the OR day actually starts when it is scheduled to. Successful tactics include improving the same-day admission process, holding a pre-surgery “huddle” of OR staff to discuss the day’s cases, and providing feedback to staff on on-time start data. For example, the Hospital for Sick Children in Toronto gathered data on the frequency of on-time starts, identified the reasons for delay, and examined the barriers to starting on time. As a result of their findings, they implemented a morning huddle for OR team members so that the surgeon, anesthesiologist, and nurses can meet to discuss the cases for the day and address any special considerations. The huddle has the dual purpose of enhancing safety through communication and getting OR staff to the operating room on time. This initiative has resulted in an increase in the percentage of on-time starts from 6% to 60% within several months (Wright, Roche, & Khoury, 2010).

### *Procedure and Turnover Time*

In an effort to reduce procedure time (anesthesia and surgical time) and turnover time between surgical cases, some operating rooms have used parallel processes to shorten sequence of events. Examples of parallel processing include the anesthesiologist starting anesthetic at the same time the nurses prepare surgical equipment, or running two adjacent operating rooms concurrently and sequencing the two cases so that surgeons and anesthesiologists can move back and forth between rooms. In Europe, a separate induction room is used for the concurrent induction of anesthesia, and in North America, local block rooms are sometimes available to place epidural or peripheral nerve blocks before bringing the patient into the OR. Success for such parallel processes may be best achievable with a select patient population and a small, highly committed group (Friedman, Sokal, Chang, & Berger, 2006). In some cases, these options may require additional personnel and a different physical layout of the suite (Macario, 2010a).

The benefits of using parallel processing, induction rooms, and other means to reduce procedure time and turnover time in ORs are time savings throughout the day with the potential to fit in another short case at the end of the day,

especially in ORs that have a long schedule, multiple shorter cases, and multiple turnovers (Friedman, et al., 2006; Harders, Malangoni, Weight, & Sidhu, 2006). Even if the time saved is not enough for an additional case, ending the operative day closer to the actual schedule could reduce the amount of staff overtime and overall staff costs for the operating room (Wright, et al., 2010).

#### *Operating Room Communication and Teamwork*

Promoting a culture of teamwork and improving communication practices in the operating room have been demonstrated to have a significant effect on efficiency, quality, and patient safety. Tools such as the surgical safety checklist from the World Health Organization (WHO), briefing and debriefing sessions, and structured communication techniques help improve teamwork and communication (Haynes, et al., 2009). A program that teaches teamwork and communication skills is another initiative that can improve communication among members of the operating room team (Halverson et al., 2011).

Improvements to operating room efficiency were noted in a number of studies after the implementation of a preoperative briefing and, in some cases, with the use of a safety checklist (Lingard et al., 2005; Lingard et al., 2008). Nundy and colleagues (2008) reported on the implementation of two-minute preoperative discussions and post-procedure surveys that were completed by staff. Results of those surveys showed that the preoperative meetings were associated with a 31% reduction of reported unexpected delays. This reduction was attributed directly to fewer communication failures during surgery and to the ability of OR staff to identify any potential problems beforehand.

Implementing preoperative meetings and surgical safety checklists has also significantly impacted patient safety and quality of care. One study showed that 86% of OR team members believed that safety checklists and meetings provided them with an opportunity to identify and solve problems, while 93% reported that the interventions contributed to increased patient safety (Nilsson, et al., 2010).

Indicators on surgical safety checklist and surgical site infection are being implemented in BC as part of the Ministry of Health's strategy to improve the quality and management of acute clinical care through a clinical care management system (Bc Patient Safety & Quality Council, 2011; Ministry of Health Services, 2011). Health authorities are expected to provide measurement on these indicators by the fall of 2011.

#### **Recommendation 1**

To improve communication, safety, and efficiency in the operating room, all surgical programs and OR team members across British Columbia hospitals should implement the surgical safety checklist and surgical briefings as standard practice.

### III. The Value of Process Improvement

The cases noted above are just some examples of how organizations have successfully improved the quality and efficiency of surgical services along various stages of the perioperative process. Most hospitals have achieved these results by using process improvement methods and by following the basic structure: examine current perioperative processes, identify root causes of bottlenecks to patient flow and quality defects, implement potential solutions, and measure outcomes. The examples provided clearly demonstrate the value of initiating perioperative process improvement and the impact it can have on patient care, provider satisfaction, and operational cost savings.

#### **Recommendation 2**

Health authorities and their hospitals should implement process improvement initiatives. Standardized performance indicators must be in place and used to measure performance before and after.

# Part 3: Process Improvement Initiatives in Other Jurisdictions

*While many individual hospitals, particularly those in the United States, have implemented perioperative process improvement initiatives, only a few jurisdictions have attempted to take a more comprehensive and coordinated approach by implementing such initiatives in multiple hospitals across a particular region or country. Experiences from these jurisdictions, which include Australia, the United Kingdom, and parts of Canada, provide insight into how a coordinated perioperative process improvement initiative can be successfully implemented in British Columbia.*

## I. The Experience of Other Jurisdictions

### *Australia*

In 1994 the Australian Department of Health and Family Services established the National Demonstration Hospitals Program (NDHP), which focused on improving patient pre-admission and admission processes, operating suite management, and discharge planning and post-acute care (Alexander, 2000; Australian Department of Health and Family Services, 1997).

Under the NDHP, 38 public hospitals were grouped into seven consortia, and major metropolitan hospitals with experience and expertise in developing best practice models were identified to lead each. The process to develop and use best practice models involved multiple stakeholders, including patients, clinical staff, hospital executives, consumer groups, professional bodies, and funding agencies. The lead hospitals then worked with and supported the other hospitals within their consortium group to transfer the use of best practice service delivery models.

The key steps of the NDHP included a needs analysis of existing services, collection of data and performance indicators, implementation of best practice models, and consolidation/continuation of the new models of service delivery. At the end of the NDHP initiative an external performance evaluation was conducted. The following are some of the key outcomes:

- Average hospital stays reduced 6% overall, and by more than 10% in 23% of hospitals.
- Unplanned readmissions within a month of discharge reduced by nearly 27%.
- Operating room utilization improved 3.1% for hospitals reporting the measure. More than 50% of hospitals achieved utilization greater than 90%.
- Cancellations on the day of surgery reduced by 20% in 28% of NDHP hospitals.
- Estimated net savings from all hospitals participating in the initiative between \$51.5 million and \$72 million per year. According to the review, the savings are substantial against the input of \$11 million used to fund the program.

## ***United Kingdom***

In 2009 the National Health Service (NHS) launched The Productive Operating Theatre (TPOT) Programme, designed to train and empower perioperative personnel with the knowledge and practical tools needed to improve surgical programs in their respective hospitals. TPOT provides a comprehensive package of foundation and training modules derived from Lean methodology, and is aimed at addressing specific operating room issues and processes (e.g., organization of the OR, patient preparation, scheduling, communication).

The program modules are used by staff to review each perioperative component with a structured approach to help identify issues, then test, implement, and measure appropriate changes. The modules are also used by senior executive hospital leaders to determine what leadership, engagement, and support is necessary to ensure the initiative is successful in their hospitals. TPOT also provides structured train-the-trainer sessions and on-site implementation support. While the program is still relatively new, participating hospitals have self-reported improvements in the following ways:

- Enhancing the safety culture, improving communication, and reducing errors by implementing structured briefing and debriefing, the WHO safety checklist, and better OR staff teamwork.
- Improving efficiency and productivity by focusing on operating start time, turnaround time, more effective utilization of operating room, and staff resources.
- Realizing financial savings by eliminating waste and making processes more efficient through standardization. For example, a minimum £5,000 (~\$8,000 CDN) in stock reduction per OR and a minimum £9,000 (~\$14,000 CDN) in recurring annual saving per OR was realized on consumables.

According to the NHS, TPOT's success is based on the fact that the perioperative teams themselves identify the problems and implement the solutions. Since the changes are specifically relevant to staff, they are more likely to be sustained. TPOT is now being implemented in hospitals throughout England, Wales, and Scotland, as well as in New Zealand. In Canada, most recently Saskatchewan has taken interest in adopting its use (Saskatchewan Ministry of Health, 26 November 2010).

## ***Ontario***

As part of Ontario's 2004 Wait Time Strategy, the Ministry of Health and Long-Term Care established the Surgical Process Analysis and Improvement (SPAI) Expert Panel, along with several other expert panels. The SPAI Expert Panel was made up of leaders in health care administration, perioperative processes, surgery, materials management, and academia. It developed a comprehensive perioperative improvement plan for the province that included advice on accountability frameworks; mapping of perioperative processes; benchmark and best practice targets, information technology, and management; human resources; education; funding; and organization of regional surgical services to increase efficiencies.

As part of the implementation strategy, the Surgical Efficiency Targets Program (SETP) was established and key performance indicators related to surgical process efficiency were developed (e.g., first-case on-time start, turnover time, scheduling accuracy, case cancellations). The list of indicators is identified in Exhibit 4.

Standard data on operating room performance are now collected by each hospital and used by the Ministry, Local

Health Integration Networks (LHINs), and individual hospitals to monitor and compare progress and help identify, analyze, and improve on areas where performance issues exist. LHINs are also able to link perioperative performance with surgical program funding.

#### **Exhibit 4. Ontario's Surgical Performance Indicators**

- % First Case On Time or Early
- % Subsequent Case On Time or Early
- Average Patient-In to Patient-Out Minutes
- Average Patient-In to Anesthesia-Ready Minutes
- Average Turnover Minutes
- % Scheduling Accuracy
- % Utilized 7 a.m. to 3 p.m.
- % Same Day Add-On Weekdays
- % Unplanned Closures
- % Same Day Cancelled or Postponed
- % Returns to Surgery Within 24 Hours
- % Patients Screened Prior to Surgery
- % Surgical Checklist/Timeout Compliance
- % Priority Cases (various)—Access Within 0–2 hours, 2–8 hours, 8–48 hours, 2–7 days

Perioperative coaching teams were also established to provide assistance to 61 hospitals that requested peer support from the coaching program. Each coaching team comprised a physician expert (surgeon or anesthesiologist), one or two surgical leaders (vice president or director), and one or two perioperative leaders/managers. Coaching was provided to help hospitals conduct self-assessments of their perioperative processes and develop improvement plans to address key practices highlighted as part of the SPAI Expert Panel recommendations. The role of the coaching teams was seen as an invaluable and successful resource because the teams were made up of peers and supported hospitals to lead their own improvement initiatives. Coaching was also seen as an opportunity to share best practices, tools, and templates (Berk, Hall, & Legresley, 2010; Sherrard, et al., 2009).

Based on a preliminary assessment of the coaching teams and the best practices identified in the SPAI Expert Panel report, all hospitals reported improvement in perioperative efficiencies, increased surgical capacity, incurred savings, and improved the quality of care (Sherrard, et al., 2009). Some of the specific achievements identified by some hospitals include the following:

- Reduced cataract surgery wait times by 18% within one year, with further reductions continuing.
- Increased surgical throughput for cataracts with reduced wait times by 76 days by creating an aide role in the cataract suite and improving processes.
- Earlier discharges and reduced lengths of stay from 6.2 to 5.4 days for hip replacements and from 5.5 to 5.2 days for knee replacements.
- Number of cancelled procedures due to bed unavailability reduced by almost half, from 24 cancellations to 14.
- Saved \$100,000 by revising the supply chain and inventory processes.

## *Saskatchewan*

In 2010 the Government of Saskatchewan, in collaboration with health care stakeholders, launched the Saskatchewan Surgical Initiative, aimed at improving surgical patients' care experience and improving access to surgical services by reducing wait times. The strategy intends to increase capacity for surgical care and improve patient flow and system efficiency through the following means:

- Increasing surgical volumes.
- Establishing safe, streamlined, patient care pathways for surgical care.
- Mapping the patients' surgical journey from initial GP visit, to surgery, rehabilitation, and home.
- Identifying and eliminating inefficient processes, and improving how OR time is allocated.
- Expanding the new provincial surgical information system (a computerized system to track information about surgical bookings, wait lists, OR usage, equipment and supplies, available staff, and other facets of surgical care).

The Surgical Initiative leverages another important initiative that has already been implemented in Saskatchewan, called Applying Lean Principles to Health Services (Saskatchewan Ministry of Health, 2010a). The use of Lean as a standardized process improvement philosophy has been adopted by the Ministry of Health, and \$5 million in funding has been used to train more than 50 Lean teams across all of the province's health regions and the cancer agency in Saskatchewan. The Lean methodology is now being applied in various initiatives across the surgical patient's journey of care, from improving surgical patient flow for day surgery, to developing a hip and knee surgical pathway, and improving operating room organization.

The results have been promising. For example, one hospital has now added an extra half-day of capacity to do an additional nine scope procedures each week, or approximately 470 more scopes each year (Livingstone, 2010). In another hospital, the operating team used Lean to improve the location and storage of supplies and help clarify each team member's responsibilities, resulting in a gradual reduction in transition time between patients to less than 11 minutes. Further time savings could potentially allow them to perform an additional surgical case each day (Saskatchewan Ministry of Health, December 2010).

A summary of the perioperative improvement initiatives undertaken in Australia, the UK, Ontario, and Saskatchewan is provided in Exhibit 5.

**Exhibit 5. Summary of Perioperative Process Improvement Initiatives in Other Jurisdictions**

Jurisdiction	Australia	United Kingdom	Ontario	Saskatchewan
<b>Initiative</b>	National Demonstration Hospitals Program (1995 to 1997)	The Productive Operating Theatre Programme (2009 to present)	Wait Time Strategy: Perioperative Improvement (2004 to 2010)	Surgical Initiative (2010 to present) and Applying Lean Principles to Health Services (2005 to 2010)
<b>Activities</b>	Group hospitals that use best practices with other hospitals to collaborate, share, and implement best practice models of perioperative care	<ul style="list-style-type: none"> <li>• Train and empower providers to identify own perioperative problems and strategies to fix them</li> <li>• Provide training tools and modules for perioperative staff, plus implementation support</li> </ul>	<ul style="list-style-type: none"> <li>• Identify perioperative best practices and set provincial benchmarks for hospitals to achieve</li> <li>• Use of peer coaching teams to assist hospitals</li> </ul>	<ul style="list-style-type: none"> <li>• Implement patient care pathways for surgical care, eliminate inefficient processes, improve allocation of operating room time, expand provincial surgical information system</li> <li>• Adopt Lean philosophy across the health system</li> </ul>
<b>Key Areas of Focus</b>	<ul style="list-style-type: none"> <li>• Pre-admission and admission processes</li> <li>• Operating suite management</li> <li>• Discharge planning and post-acute care</li> </ul>	<ul style="list-style-type: none"> <li>• Foundation issues: executive and program leadership, information for decision making, and OR organization</li> <li>• Enablers: teamwork and scheduling</li> <li>• Process issues: OR startup, patient preparation, turnaround, handover, consumables and equipment; patient recovery</li> </ul>	<ul style="list-style-type: none"> <li>• Accountability frameworks</li> <li>• Perioperative process mapping</li> <li>• Benchmarks and best practice targets</li> <li>• Information technology and management</li> <li>• Human resources, education, and funding</li> <li>• Organization of regional surgical services</li> </ul>	<ul style="list-style-type: none"> <li>• Various, including hip and knee clinical pathway; safety checklist; process mapping; surgical information system; etc.</li> <li>• Integrate Lean into Ministry of Health, all health authorities, and agencies</li> </ul>
<b>Process Improvement Methodology or Approach</b>	Collaborative model for hospitals to share and implement best practices	Customizing use of Lean approach into training modules	Process mapping and use of best practices	Adoption of Lean principles and tools
<b>Products</b>	Review document with critical success factors and identified best practice models in OR management and discharge planning	<ul style="list-style-type: none"> <li>• The Productive Operating Theatre module and toolkit</li> <li>• Staff to provide train-the-trainer and implementation support</li> </ul>	<ul style="list-style-type: none"> <li>• SPAI Expert Panel Report</li> <li>• Surgical Efficiency Target Program (provincial efficiency indicators and benchmarks)</li> <li>• Perioperative coaching teams</li> <li>• Reference Guide and Toolkit</li> </ul>	N/A
<b>Key Success Factors</b>	Collaborative support and expertise provided by lead hospitals to other hospitals	Empowerment of perioperative personnel based on standardized process improvement training	Use of peer coaching teams to assist individual hospitals assess processes and make changes, and use of provincial efficiency benchmarks	Senior leadership adoption and staff buy-in to Lean philosophy of continuous improvement

## II. The Experience in British Columbia

### *Surgical Process Improvement Projects*

Several surgical programs in BC have conducted process improvement projects including, among others, the following:

- Hip and Knee Reconstruction Project at Richmond Hospital—Vancouver Coastal Health.
- Ambulatory Eye Surgery Clinic at Royal Jubilee Hospital—Vancouver Island Health Authority.
- Surgery Pre-Admission Clinic at St. Paul’s Hospital—Providence.
- Transfer of care between the OR and the pediatric intensive care unit at BC Children’s Hospital—Provincial Health Services Authority.

The Hip and Knee Reconstruction Project (The Arthroplasty Plan) has been one of the most successful initiatives in BC. It uses best practice methods to maximize utilization of resources and efficiencies. Accomplishments from this initiative include:

- 136% increase in hip and knee replacement surgeries (from 275 to 675 cases per year).
- 25% reduction in average length of stay in hospital (4.1 days for hips and 3.1 days for knees).
- 25% improvement in OR efficiency, resulting in more cases performed per day.

The success of the arthroplasty initiative has resulted in the development of a toolkit to help transfer these best practices to other centers in BC, Canada, and internationally (Health Council of Canada, 2007; Hughes & Roberts, 2006).

Other initiatives have also been undertaken in BC hospitals as a result of funding from the Lower Mainland Innovation and Integration Fund, and more recently through Patient Focused Funding, which encourages hospitals to find efficiencies through innovation and integration of existing and new services (Mickleburgh, 2010, November 9; Vancouver Coastal Health, 2009, October 20). However, the majority of process improvement projects in BC have been initiated by hospitals and surgical departments on an individual and ad hoc basis. To date there has been very limited coordination of process improvement projects or use of common process improvement models across hospital programs. However, in its 2011/12 Service Plan, the Ministry of Health committed to a strategy to implement a system-wide approach to apply Lean design across the health system, and health authorities are beginning to execute this strategy in their regions (Ministry of Health Services, 2011; Provincial Health Services Authority). An opportunity exists to increase coordination of perioperative process improvement initiatives in BC, and sharing of individual hospital experiences.

### *A Strategy for Enhancing Surgical Capacity*

The Provincial Surgical Advisory Council is currently implementing the Surgical Patient Registry to track, prioritize, and manage patients on the surgical waiting list. Consideration is also being given to establishing wait time benchmarks for all elective procedures in the province. Therefore, it will be imperative to develop a strategy to ensure there is adequate surgical capacity to realistically meet the access benchmarks. Part of that strategy should include a systematic way of examining the current perioperative processes and uncovering hidden capacity by eliminating inefficiencies and

improving surgical quality. Without undertaking this work in each hospital, it will be difficult to achieve the scale of improvement that is likely needed to uncover capacity in the current system.

Other jurisdictions have demonstrated the value in developing a coordinated strategy for perioperative improvement and providing structured implementation support to hospitals to scale up system change. It is time for British Columbia to develop its own strategy. The benefit of developing a provincial framework is the ability to establish clear provincial goals and objectives on how surgical services in the province can be improved to meet the growing demands for surgical services. With a well-defined mandate, all stakeholders can work along the same path to meet those goals and achieve perioperative systems change in a more comprehensive and integrated manner.

### **Recommendation 3**

The Ministry of Health, through the Provincial Surgical Advisory Council (PSAC), should establish a multi-stakeholder Perioperative Improvement Panel (PIP) that will, within six months of its initial meeting, develop a report with a provincial framework for improving surgical quality, efficiency, and access in hospitals across BC.

Members of the PIP should include representation from the Ministry of Health, health authorities, the BCMA, the Perioperative Nurses Association of BC, the BC Patient Safety & Quality Council, surgical patient representatives, and associations and regulatory bodies representing clinical perioperative providers. The composition of PIP must include practising clinical and administrative perioperative leaders from BC hospitals, and individuals experienced in process improvement.

The PIP framework should include a guide and checklist to assess the efficiency, quality, and access to perioperative care in each hospital, as well as to identify high-level best practices and a means to spread the adoption of new processes and ideas used in individual hospitals.

### **Recommendation 4**

The PSAC should oversee the implementation of the provincial framework and ensure that process improvement projects undertaken by health authorities and hospitals are coordinated and integrated within the framework.

The PSAC, along with established regional surgical advisory councils, is already working to better coordinate surgical care across the province. As an established committee with representation from the Ministry of Health, health authorities, the BCMA, and other organizations, the PSAC would be the most appropriate body to oversee the implementation of a provincial perioperative improvement framework.

Process improvement is about supporting and enabling perioperative personnel in individual hospitals to enhance quality, efficiency, and access to surgical services for patients. However, better system integration and coordination is also required to ensure that system change and improvement can be expanded so that all surgical patients across BC can benefit. The role of the PSAC should be to focus perioperative process improvement on key objectives such as:

- Improving the experience and outcomes of surgical patients.
- Enhancing satisfaction of perioperative personnel.
- Decreasing operational inefficiency and cost.

These objectives are consistent with the IHI's Triple Aim to optimize the health system by improving the health of the population, enhancing the patient experience, and reducing or limiting the per capita cost of care.

# Part 4: Best Practices, Lessons Learned, and Critical Success Factors

*When developing a provincial framework to improve perioperative care in BC, a lot can be learned by examining the various surgical improvement initiatives undertaken in BC and in other jurisdictions. Many of the lessons learned and success factors are consistent across the different initiatives in each jurisdiction, and highlight the components that need to be in place to successfully implement perioperative process improvement initiatives. Consideration should be given to the best practices, lessons learned, and critical success factors identified in academic literature and by other jurisdictions.*

## I. Clinical Champions and Staff Engagement

Identifying clinical champions (e.g., surgeons, anesthesiologists, nurses, and other perioperative personnel) who are willing to participate in initiatives to improve the quality of their respective services is one of the most important factors when initiating successful systems change. Without the engagement of clinical leaders, the necessary changes will not occur. Experience has shown that with any initiative, some resistance is to be expected. However, when clinical champions are able to demonstrate successful changes that benefit both their patients and staff, it can help convince others to adopt (National Health Service, 2010).

For this reason, the involvement of physicians, nurses, and other perioperative staff at the beginning of the initiative during the planning and project design phase is recommended. The experience of the Productive Operating Theatre implementation in the UK demonstrates that clinicians can be extremely enthusiastic and committed when they are empowered to identify problems and are able to implement solutions that are specifically relevant to them. Positive changes are also more likely to be sustained when led by perioperative personnel (M. Morgan-Cooke, personal communication, December 21, 2010). Support to perioperative personnel in the form of change management support and opportunities for them to learn and use process improvement methods to redesign patient flow and operational processes are also a critical component to facilitate continuous quality and process improvement.

### **Recommendation 5**

Health authorities and hospitals must identify and support clinical champions to lead multidisciplinary perioperative improvement teams at each hospital. Support should enable the perioperative improvement teams to make relevant changes based on local needs and priorities.

Perioperative improvement teams should consist of, but not be limited to:

<ul style="list-style-type: none"> <li>• Surgeon</li> <li>• Medical office assistant</li> <li>• OR booking</li> <li>• OR coordinators—registered nurses (RNs)</li> <li>• Preadmission clinic</li> <li>• Admitting staff and RNs (arrival at hospital)</li> </ul>	<ul style="list-style-type: none"> <li>• Central supply department</li> <li>• Porters (to OR)</li> <li>• OR admitting staff (arrival at OR holding, RN, porters)</li> <li>• Anesthesiologist and technician</li> <li>• OR nursing staff</li> </ul>	<ul style="list-style-type: none"> <li>• Surgeon and assistant</li> <li>• OR porters</li> <li>• OR cleaners</li> <li>• Post-anesthetic recovery staff</li> <li>• “Bed control” team (check wards for available post-op beds)</li> <li>• Hospital executive leaders</li> </ul>
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The Specialist Services Committee (SSC), a joint committee of the Ministry of Health and the BCMA, has recognized the benefit of supporting the engagement and participation of specialist physicians in health system redesign initiatives. The SSC has made funding available to provide scholarships for specialist physicians who may wish to obtain leadership training or system redesign training. As well, funding is available to support specialists who participate in health system redesign initiatives. Health authorities should take advantage of the financial support provided by the SSC by applying for funding to facilitate physician engagement in perioperative process improvement.

### Recommendation 6

Health authorities should work with the Ministry of Health and the BCMA at the Specialist Services Committee (SSC) to identify how SSC funding can be used to help support physicians who wish to learn about process improvement methodologies and who want to participate in perioperative process improvement initiatives.

## II. Organizational Culture

Adopting and sustaining change initiatives requires an appropriate organizational culture that is supported by everyone from the health authority, hospital boards and CEOs, through to perioperative managers and providers. In order to obtain the buy-in of champions and persuade slow adaptors who may be skeptical, the initiative should be adopted with a view to promoting an organizational culture that is more collaborative and accountable. Successful initiatives utilize a staff-empowering approach and focus on continuous performance improvement for the benefit of both patients and staff.

Instilling a culture of collaboration and teamwork is also helpful in breaking down departmental barriers within the perioperative process as well as with other parts of the hospital. For example, enhanced cooperation and communication between scheduling, supply chain management, and bed management helps various departments

better understand not only their part of the process but how each component is related and interdependent. Overall, it is crucial for clinical leaders and administrators to work as a team in a constructive and collaborative environment. A good working relationship between the key players can help to improve and enhance the effectiveness of the OR system and ensure that improvements are sustained (Calmes & Shusterich, 1992).

Although recommendations in this policy paper are directed toward improving surgical care, it must be recognized that the development of such an organizational culture will have benefits for the organization that extend far beyond the surgical suites; such a culture may well enhance effectiveness and efficiency in other parts of the hospital system as well.

### III. Leadership

Strong leadership, both at the senior management and program levels, is critical to success (Nolan, 2007). Senior leadership at the health authority and hospital, including the board, CEO, and senior executives, should be actively engaged to drive and support change. The likelihood of successfully implementing and sustaining improvement in perioperative efficiencies is enhanced when senior executives:

- Champion the adoption of cultural change into the organization, which includes open communication and teamwork, the continuous pursuit of improvement, and the empowerment of clinical providers to generate and implement innovative solutions based on best practice.
- Provide clear direction about the strategic objectives for the hospital and ensure that the perioperative program is aligned with those objectives through accountability mechanisms.
- Demonstrate visible leadership and engage with staff, providing legitimacy to the initiative and making staff aware of the commitment and support of senior leadership.
- Provide the appropriate resources for staff training and change management, such as freeing up staff time and assigning dedicated resources to participate in the initiatives.

Leadership is also crucial at the perioperative program level. To effectively plan and manage the program, a leadership team is needed and should include representatives from administration, surgery, anesthesiology, nursing, and other clinical and ancillary providers. The role of the perioperative leadership team within each hospital is essential to:

- Develop a practical and realistic plan for initiating and sustaining perioperative improvement.
- Define perioperative management goals and set measurement indicators with a process to monitor and evaluate performance at the level of the individual provider, service, and system.
- Conduct a hospital self-assessment of the perioperative process and to determine where blockages or bottlenecks occur, focusing on improving those areas that add value to the process.
- Ensure optimal coordination and communication across the entire perioperative process.
- Use measurement indicators to help drive evidence-based decision making to improve the quality and patient safety outcomes, as well as the efficiency of the program.

### IV. Patient Focus and Patient Engagement

Developing a perioperative improvement program with a strong patient focus is integral to improving the quality and safety of surgical care, as well as the efficiency of service delivery. The patient perspective must be incorporated into any

system redesign initiative, as only the patient can provide a clear evaluation of his or her experience through the entire surgical journey.

Patients can engage meaningfully in the process by including them as partners in all relevant stages of the initiative, including design, implementation, and evaluation. For example, in Saskatchewan patients are represented by patient advisors on both the Surgical Initiative's Executive Sponsorship Group and their Guiding Coalition (Saskatchewan Ministry of Health, 2010b). Ongoing mechanisms for surgical patients to provide feedback to providers, through regular exit surveys and focus groups, also provide an excellent opportunity for organizations to examine whether the services are meeting the needs of patients.

### **Recommendation 7**

Patient representatives should be engaged as partners in initiatives to improve surgical care by participating on the provincial PIP as well as on committees at the local hospital level and the regional health authority level.

Clinical and administrative personnel should work collaboratively with patients to identify quality and efficiency issues relating to the perioperative process and to develop solutions that improve the surgical patient experience and outcomes.

## **V. Implementation Support**

Whether it is the use of standardized training in process improvement analysis methods (UK, Saskatchewan), lead hospitals supporting other hospitals to adopt perioperative best practices (Australia), or peer coaching teams advising hospitals on conducting process mapping and developing action plans (Ontario), all jurisdictions have indicated that providing coordinated implementation support is a key success factor for implementing process improvement initiatives. Coordinated support to hospitals ensures that all hospitals and staff have similar access to expertise and analysis tools, and they all understand best practices and lessons learned from other hospitals. This saves much time and effort, as individual surgical programs do not have to start from scratch. The Ministry of Health and health authorities will need to allocate appropriate funding to support implementation of this initiative.

In addition, the experience of other jurisdictions has demonstrated that data collection for performance measurement has been one of the most challenging components, primarily due to inherent problems with developing or adapting automated systems. The challenges that hospitals will inevitably face, and the amount of resource support needed for information management should not be underestimated.

### **Recommendation 8**

To aid the implementation of the provincial framework, the PSAC should establish an implementation support unit to assist hospitals and the perioperative improvement teams. The implementation unit can work with hospitals and community surgical facilities to assess their surgical programs and develop action plans to improve their perioperative processes based on best practices identified by the PIP.

Implementation support can take the form of one provincial unit, or smaller regional implementation units that would work in coordination with the PSAC, regional surgical advisory councils, and existing support services and expertise within individual health authorities. Implementation unit members should consist of clinical and administrative leaders with significant experience in managing surgical services and resources, as well as experts in process improvement. Implementation support should also include information technology and management assistance, and data analysis expertise to help hospitals set up performance management reporting systems that will facilitate the collection and analysis of perioperative performance information.

Consideration should also be given to initiating forums and conferences so that perioperative improvement champions and perioperative improvement teams from individual hospitals have a venue to meet and discuss their perioperative quality and efficiency issues, share best practices, and learn from each other about how best to improve surgical services.

The BC Patient Safety and Quality Council (BCPSQC) is initiating a Surgical Quality Action Network to facilitate provincial collaboration and sharing of innovation and best practice in surgical quality in areas such as clinical care management (e.g., surgical checklist and surgical site infection), adoption of the National Surgical Quality Improvement Program (NSQIP), and patient reported outcome measures. There is an opportunity to expand the scope of the Network to take on the role of the implementation support unit as envisaged in this paper, in order to support both a quality and efficiency improvement agenda.

## **VI. Information and Performance Measurement**

Improving surgical quality and efficiency must be data-driven. In all of the major surgical improvement initiatives that have been implemented, performance measurement has been a vital component. Collecting performance data on surgical quality and efficiency can help organizations shift from managing by assumptions to managing on the basis of demonstrated evidence. Measuring performance also allows implementers to determine if changes being made are producing the intended results.

Ontario has implemented standardized OR performance indicators across all hospitals in the province, while several other established surgical efficiency performance measurement programs are offered by private vendors (Mckesson; Sullivan Healthcare Consulting Canada). Currently in BC, no standard measures of OR efficiency are collected consistently across all hospitals. However, the Interior Health Authority has recently developed a suite of standardized OR efficiency performance indicators (e.g., first case on-time start, turnover time, delays) that are being applied across all ORs within Interior Health. The use of standardized efficiency indicators should be expanded across all hospitals in BC.

The use of surgical quality indicators is a relatively recent development. The American College of Surgeons (ACS) has implemented the National Surgical Quality Improvement Program (NSQIP), which is a data collection program that tracks surgical quality and outcomes such as preoperative risk factors, operative variables, and 30-day postoperative mortality and morbidity outcomes for patients undergoing major surgical procedures. Individual hospitals enrolled in the ACS NSQIP submit their data on a continuous basis, and the program is able to provide reports that compare the participating hospital's risk profiles and outcomes with those of peer hospitals and against national averages. Hospitals can then use this feedback to re-engineer their workflows, foster and improve internal education, and develop clinical performance improvement initiatives.

The Fraser Health Authority has already used NSQIP in three hospitals, including Surrey Memorial. This quality performance tool helped the hospital reduce surgical site infections from over 13% to 7% between 2006 and 2009. This reduction resulted in \$2.54 million of savings through decreased complications and lengths of stay (American College of Surgeons). With funding from the Health Services Purchasing Authority, NSQIP is now being adopted by 18 more hospitals across BC, with the implementation support of the BCPSQC's Surgical Quality Action Network. The expanded use of NSQIP across BC is beneficial to track surgical quality, but it must also be complemented by integrating indicators of efficiency in order to measure and improve overall perioperative performance.

### **Recommendation 9**

The PIP should develop or adopt existing standardized indicators and benchmarks that can track and measure both perioperative efficiency and quality performance in all surgical programs across the province. Using provincial benchmarks, individual hospitals should establish performance targets, track their progress through the collection of performance indicators, and make continued improvements against those targets.

### **Recommendation 10**

The Ministry of Health should work with health authorities to incorporate the reporting of standard perioperative quality and efficiency performance indicators in the annual performance accountability agreements between the Ministry and individual health authorities. Where appropriate, public reporting on overall performance is encouraged.

Performance agreements between the Ministry and individual health authorities should identify how each individual health authority will work to improve perioperative performance and report on the performance measures. Future consideration should be made by the Ministry and health authorities to link incentives from activity-based funding to the performance of individual hospitals based on the quality and efficiency indicators.

Over the long term it will be important to measure and determine what outcomes and impact the provincial

framework to improve surgical quality, efficiency, and access for patients will have at the local hospital level and on a provincial scale. An evaluation plan should be included as part of the provincial framework developed by the PIP.

### **Recommendation 11**

The provincial perioperative improvement framework must include an evaluation component to measure whether the provincial initiative is successful at improving the quality and efficiency of perioperative services at the level of individual hospitals as well as at a provincial level.

## **VII. Surgical Capacity and Operating Room Closures**

Pressure to limit hospital operating expenditures can sometimes have a negative impact on access to surgical care, such as when hospital budget constraints result in operating rooms being regularly closed, and surgical programs and services being reduced (Fayerman & Cernetig, 2007, January 18; Moreau, 2009, July 18; Nieoczym, 2010, January 5; Scallan, 2010, March 6). Hospitals have been motivated to increase the down time of the ORs during break or vacation periods in order to reduce operating costs. Typically the number of ORs that are open and resourced is reduced, at minimum, by one week over the winter holiday, two weeks over the spring break, and by as many as eight weeks during the summer school holidays. While these OR closures do coincide with reduced availability of staff and patients, the reduction in OR capacity may be more than necessary to accommodate the reduced availability. Efforts should be made to make optimal use of OR resources and capacity that may be currently underutilized.

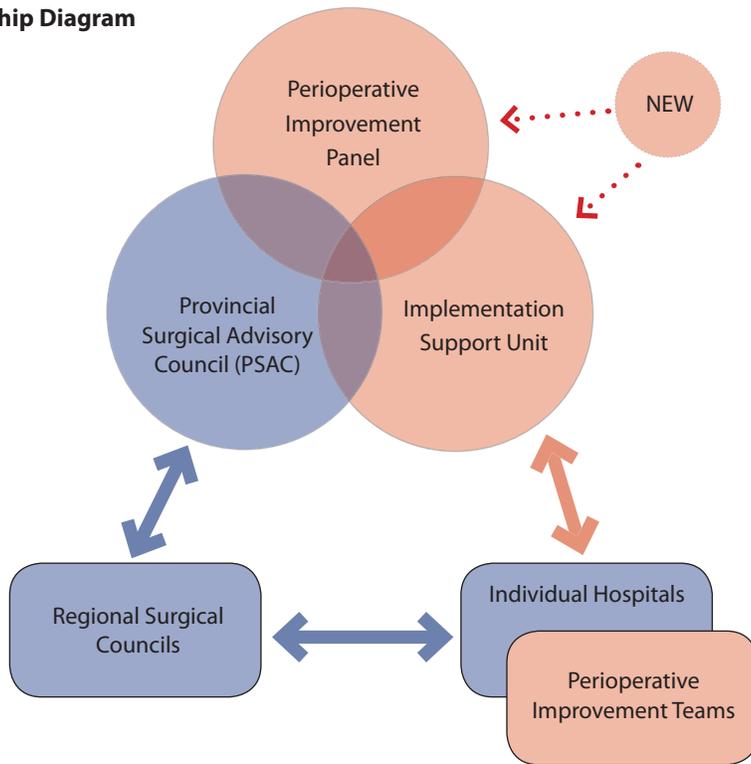
The Health Services Purchasing Organization provides hospitals, through the activity-based funding program, additional per case funding to provide incentives to hospitals to conduct more surgical procedures. The use of activity-based funding and other means should be examined to help minimize the OR down time periods so that this lost OR capacity can be restored to serve more patients.

### **Recommendation 12**

Health authorities and hospitals should consistently re-examine how seasonal OR closures can be shortened. Currently unused or underutilized operating rooms should also be examined as options for increasing access and efficiency.

The relationship between the existing structures (PSAC, Regional Surgical Councils, and Individual Hospitals) and the proposed complementary structures (PIP, Provincial Implementation Support Unit, and Perioperative Improvement Teams) is identified in Exhibit 6. The proposed roles and responsibilities of each body are identified in Exhibit 7.

**Exhibit 6. Relationship Diagram**



**Exhibit 7. Perioperative Process Improvement Roles and Responsibilities**

<p><b>Perioperative Improvement Panel (ad hoc)</b></p> <ul style="list-style-type: none"> <li>• Conduct survey of perioperative practices across BC hospitals, including consultation with perioperative personnel on issues, problems, and potential solutions.</li> <li>• Identify high-level best practices and areas that require improvement.</li> <li>• Develop provincial performance indicators to measure perioperative quality and efficiency.</li> <li>• Identify high-level goals and outcomes for improving surgical quality, efficiency, and access.</li> <li>• Develop provincial framework to implement perioperative process improvement.</li> <li>• Act as steering committee during implementation.</li> </ul>	<p><b>Provincial Surgical Advisory Council &amp; Regional Surgical Councils</b></p> <ul style="list-style-type: none"> <li>• Oversee implementation of perioperative process improvement framework.</li> <li>• Oversee adoption and monitoring of provincial performance indicators.</li> <li>• Arrange and coordinate implementation support (e.g., contract for process improvement training, technical support for data collection, and analysis).</li> <li>• Coordinate ongoing review and analysis of performance measures.</li> <li>• Evaluate progress and impact of provincial framework.</li> </ul>
<p><b>Individual Hospitals</b></p> <ul style="list-style-type: none"> <li>• Adopt culture of quality and process improvement throughout organization.</li> <li>• Establish local perioperative improvement teams.</li> <li>• Conduct perioperative quality and process improvement.</li> <li>• Educate and train staff in process improvement methods.</li> <li>• Use perioperative assessment tools process such as process mapping exercises to identify problem areas and best practices.</li> <li>• Collect baseline and ongoing data on perioperative quality and efficiency performance indicators.</li> <li>• Develop action plan for implementing process improvement (areas to improve, resources required, etc.).</li> </ul>	<p><b>Implementation Support Unit</b></p> <ul style="list-style-type: none"> <li>• Provide support to regional surgical councils, individual hospitals, and local perioperative improvement teams.</li> <li>• Provide educational opportunities and expertise on using process improvement methodologies and perioperative best practices.</li> <li>• Assist with process mapping in individual hospitals.</li> <li>• Spread adoption of best practices and patient culture at system and unit levels in each health authority.</li> <li>• Facilitate conferences and forums for individual hospitals to share best practices &amp; lessons learned.</li> </ul>

# Summary

Undertaking process improvement initiatives to change the way in which surgical services are managed and delivered requires considerable commitment from hospitals and perioperative personnel. It also requires health authorities and hospitals to make initial funding investments to develop and implement these initiatives. However, organizations that have made the investment have been able to demonstrate that the returns have been worthwhile in terms of improvements to the patient experience, increased staff satisfaction, and operational cost savings due to better delivery of surgical care. Jurisdictions that have developed a coordinated strategy to implement perioperative process improvement initiatives have made considerable gains, as demonstrated by performance indicators, in enhancing the level of quality, efficiency, and access to surgical care on a broad scale. There is now an opportunity for British Columbia to do the same.

# Appendix

## ***Treat the Whole Me***

*Patient Perspectives on the Perioperative Experience:*

*A Focus Group Summary Report prepared by Patient Voices Network, ImpactBC*

### **Introduction**

At the request of the BC Medical Association, the Patient Voices Network (PVN) conducted a focus group on Saturday February 26, 2011, to gather patient input about surgical access and efficiency. Eight patient partners, residing in regions served by four provincial health authorities (Fraser Health Authority, Interior Health Authority, Northern Health Authority, and Vancouver Island Health) were identified by PVN to participate in the day-long focus group.

The participants ranged in age, gender, cultural background, and personal surgical experience. The group included males and females between the ages of 50 and 75 years, two of whom were from Aboriginal communities in BC. The range of surgical experiences included both elective and emergency surgeries, specifically knee replacement surgeries, open heart surgery, cataract surgery, gynecological surgery, hernia repair, and lower leg amputation. Many of the participants also contributed to the discussion from their perspective as a caregiver or family member providing pre- and postoperative support to a loved one.

Focus group participants identified six quality-related areas that could improve their perioperative experiences:

1. Communication and information-sharing
2. Better planning
3. Patient influence/control vs. vulnerability
4. Anxiety/fears vs. safety/security
5. Responsibility (most responsible clinician)
6. Patient feedback

This summary report was shared with the participants, and their comments and recommendations were verified. However, patient names have been changed to protect the identity of the participants.

### **Key Findings**

#### ***1. Improve quality of communication and information-sharing at all stages of the perioperative process to ensure continuity of care***

Participants shared a number of negative experiences during the discussion, and many of them pointed to a lack of information sharing and breakdowns in communication processes among medical staff, and also between the patients or family members and medical staff.

## ***Darlene's story***

One patient's story highlighted the need for effective communication and accurate information-sharing. Darlene told the group about her experience having knee surgery in light of an identified and uncorrected medication error in her chart.

Someone had prepared a common pain medication and had entered in the chart that Darlene had taken the medication before it was actually administered. When Darlene was presented with the medication, she reminded the clinician that she was allergic to that particular medication and refused to take it. However, Darlene was told that her chart could not be amended by that clinician. The "dose" she didn't take stayed on file uncorrected, creating the impression it was fine for her to take.

*"Hospitals substitute in generic drugs and don't always tell you... You need to ask if the hospitals even have your meds available before you show up for surgery. Staff not only need to give you information, they need to receive it from you too."*

Despite her warnings about her allergies, Darlene was in fact administered the incorrect pain medication after her surgery and experienced a severe allergic reaction.

Since her experience, Darlene feels that staff should consult with the patients to ensure their chart information is accurate: *"...that simple step would alleviate so much of the anxiety [the patient feels] about the potential for complications."*

The focus group members acknowledged that a thorough and accurate consultation experience can prevent or at least alleviate many of the challenges that both patients and staff experience in subsequent stages of the perioperative process. At least two of the patients in the focus group experienced the effects of inaccurate or incomplete chart information. In Darlene's case, she experienced a life-threatening allergic reaction to a post-surgical pain medication; in the other case, a surgery had to be cancelled at the last minute because the patient's regular use of an anticoagulant medication was not identified earlier at the preoperative stage.

Specific recommendations to improve communication and information sharing include:

- There should be improved communication and information-sharing in all manners of communication (verbal, written notes, information sheets, charts), with all parties concerned (staff, patients, family members), across all sectors of the health care system (primary care, home and community care, acute care).
- GPs should maintain a relationship with the patient's specialists or other care providers to ensure coordination and continuity of care.
- Patients should be clearly informed when test results are ready, who has the results, and who will share or interpret the results with the patient. They would prefer this information also be sent to them directly from the lab or their specialist.
- More information should be provided to patients during the surgical consultation process, including why surgery was necessary, the risks, adverse effects (e.g., postoperative pain, delirium), or alternative treatments. There was general agreement within the focus group that patients often consent to surgery, without feeling fully informed of the risks or potential consequences. In one patient's words, "the right information matters."
- Patients' emotional and physical needs should be met through kindness and respect, and in a way that alleviates fear and builds trust with their care providers.
- "The behaviour of the clinician toward the patient matters more than when the consult occurs or how long it takes."

- o “When surgery is bumped, keep patient and family informed... it’s awful if your surgery is suspended with no information or respect.”
- o “Treat the patient with compassion, kindness, and respect even if you think the patient is drowsy or ‘out cold’ ... Staff need to know that patients can hear them!”
- The health system should ensure accuracy when collecting and sharing information. Methods for collecting and sharing information can create errors such as misunderstanding handwritten critical information, or losing or misfiling papers.
  - o “Communication within the system is still in silos. Information comes to the patient from the different silos.”
- Patients should have the ability to review their own chart with providers in order to identify and correct chart errors with a clinician and prevent further complications.
  - o “It’s hard for patients to get access to their own chart, but it’s amazing what mistakes you see when you do (e.g., wrong medications, allergies).”

## 2. Better planning up front

Improved up-front planning was also identified as a priority. The group recognized that improved planning measures and communication strategies would likely result in patients’ greater sense of control and influence over their surgical experience, and in lower levels of anxiety and fear. As one patient commented, “[fast access to surgery] is nice, but I would rather have lots of advance notice and thorough planning.”

### *Laurel’s story*

Laurel lives in a small, remote community about a five-hour drive from a major hospital. She had been on a wait-list for knee replacement surgery for about six years when she received a phone call notifying that there had been a cancellation, and asking if she could be available for surgery in one week’s time.

Laurel received some basic information to help her prepare for surgery, and did what she could to prepare her home for her post-surgery period, but she soon found she was desperately unprepared for her post-surgical experience.

A couple of days after her surgery, Laurel was discharged from hospital without any social support in place. Laurel decided to stay at a local hotel to recover further before embarking on the five-hour drive home. *“I had to stay in a hotel room by myself. I needed ice and a person to care for me.”*

Once she arrived home, she again found herself alone without adequate assistance. *“The home support that was promised was not in place. I live alone and out of town, and nobody was able to bring me to rehab appointments. You think you are totally prepared but then you realize it’s more than you thought.”*

*If there was a key message Laurel wanted to share about the need for advance planning, it would be this: "The system needs to know that things change...people who are supposed to help don't show up...you get sick, and you hurt more than you thought."*

Laurel's story resonated with other patients from rural communities. The group agreed on the importance of having a complete discharge plan and someone to help you, especially if your family is unavailable. According to one patient, "It's very stressful to handle things on your own. You need a medical navigator."

Other specific recommendations to improve up-front planning include:

- Ensure every patient is fully and adequately prepared for surgery, with realistic expectations for their perioperative process and the reality of their recovery.
- Plan for postoperative recovery and discharge during consultation (when surgery is agreed to), not at hospital admission or discharge. This would decrease patients' anxiety and help with informed decision-making.
- Ensure pre- and postsurgical supports are in place for every patient, and are appropriate for each patient's needs.
- Provide a process flowchart so that patients are clear on expectations of the process for their procedure, recovery, etc. (what to do/next steps).
- Use the family physician as the "point person" or coordinator.
- Reassess the discharge plan at time of discharge to ensure it is still reasonable and that required postoperative supports are actually in place. Does the patient have adequate medication upon leaving hospital (to provide for long trip home, or weekends when pharmacy is closed)? Is home support arranged and confirmed before patient leaves hospital? Does patient agree that he or she is ready for discharge?
  - "My mother was discharged without any nursing support. Our family was given a bag of dressings and we were sent on our way. When I called home care, they said, 'Sorry, the nurse is not available for two days... didn't you know to go to the wound clinic?'"

### **3. Increase Patient Influence; Control and Decrease Vulnerability**

Patients identified that being regarded in a respectful manner, being well informed of their procedure, and having access to their health information is key to minimizing their vulnerability. As one patient mentioned, "You lose all control and self-protection in an alien world. The vulnerability changes your ability to act which increases your vulnerability even more."

The patients who expressed serious concerns regarding their level of personal control identified the need for strong self-advocacy when a person is a postsurgical patient in hospital.

- "Self management doesn't stop when you are admitted to hospital."
- "Having an advocate or being an advocate is key to ensuring that decisions are made with your best interest in mind."
- "Hard or complex decisions need to have the patient or family member fully involved, and able to tell of previous experience and preferences."

Although the quotes below do not represent the sentiments of every surgical patient, they indicate how patients are sometimes made to feel when they are prepared for surgery:

- “Once you are in the surgery receiving area, you are like a lab rat...[the staff] are busy, but...”
- “You’re put on the table with little attention to dignity... it’s no big deal to them, but that does not mean it’s no big deal to me.”
- “I am a number: a bed, days in hospital, a surgery spot.”

The following are examples of things patients did to improve their influence/control of their experience:

- Brought alternatives to attention of surgeon and had good experiences of shared decision making/partnership.
- Took audio recorder and a partner to each consultation so information would not be missed (practitioners were okay with this).
- Had questions written down in advance so key questions wouldn’t be forgotten.
- Negotiated with physician to be “allowed” to self-monitor and self-administer insulin while in hospital.

#### **4. Anxiety and Fear vs. Safety and Security**

The individuals in this focus group expressed a wide range of experiences resulting in various levels of anxiety and fear or safety and security. Noted below are some suggestions to alleviate patients’ feelings of anxiety and fear:

- Create a culture in which patients’ concerns are valued and their special needs are respected and acted upon at all stages of the perioperative process.
  - “Staff should act in a way that respects the increased stress level of patients in the moments leading up to and including surgery.”
  - “If you have allergies or other complications, it is more scary because you know what can happen and you can see when the staff aren’t listening to you.”
- Acknowledge the concerns of patients. Building a rapport based on respect is key to the patient feeling safe and secure.
  - “If the clinicians are dismissive of the patient’s special needs or other conditions, this increases the patient’s stress and anxiety.”
  - “Knowing that staff are responding to your needs gives reassurance they will continue to help.”
  - “Hospital staff need to listen to your advocate.”
- Allow adequate time for in-depth pre-surgery consultations to address issues such as medication reconciliation, pain management, or expectations for recovery. If the patient is feeling anxious about his or her surgery, or if the patient is a “complex case,” this will go a long way to reducing the anxiety level.
  - “If a patient is not adequately informed about what to expect, this can lead to extreme emotional trauma and fear of further care or surgery.”
  - “If patients are clear on what to expect, how to manage their pain, and who to call for help, they will have much less fear and anxiety.”

Patients expressed their feelings and concerns about their postoperative pain experiences. Some of their comments are noted below:

- Staff need to be extremely sensitive to patient needs in the recovery area.
  - “Waking up without [pain medications] prepared in advance is hell.”
  - “Waking up hurts and is frightening and makes you scared about more things.”
  - “Patients need VERY HUMAN interactions at this time.”
- A good GP relationship is key to ongoing pain management, and pain management is the key to recovery, ability to move, etc.

### **5. Most Responsible Clinician to Oversee Coordination of Whole-Patient Care**

The patients in this focus group expressed very clear concerns about trusting medical staff to be on the alert for “whole patient” care, and to avoid treating “the body part” in isolation of other postsurgical complications or chronic health conditions.

- Patients trust doctors because they are the experts. Patients assume the doctors have looked at their file and have chosen the best option for “ME.”
- They question whether the surgeon should be the most responsible physician for the patient’s overall care, or whether another highly trained “case manager” should be assigned with this responsibility—someone who is on the alert for systemic physiological concerns, not just localized surgical symptoms.
  - “It’s terrifying not having a ‘most responsible person’ or someone to follow you when you know you have complex needs.”

#### ***Karen’s Story***

Of all the patient experiences shared during the focus group, Karen’s was by far the most poignant and profoundly disconcerting. Karen’s story was shared in memory of her late husband, Mr. B, who died “unexpectedly” eight days after what was considered to that point a “successful” leg operation.

Karen’s husband was a relatively fit senior with comorbidities. He was assessed for an operation to his leg that was supposed to take three hours. Mr. B’s surgery ended up lasting for seven hours. Following the surgery, he was admitted to the ward where he soon developed symptoms of a *C. difficile* infection.

Unfortunately, it was three days before the lab tests were ordered and antibiotics administered. Because his surgery left him immobile and confined to bed, Mr. B was unable to clear his chest of congestion and his respiration deteriorated.

According to Karen, *“the Staff did not respond to the symptoms of infection as a comprehensive process...they treated the symptoms individually. If symptoms are only matched to individual specialist ‘snapshots,’ you don’t get an overall ‘moving picture’ of the patient’s complete condition.”*

Mr. B endured eight days without food, suffered from delirium, a fluid imbalance, and lack of sleep (aggravated by his delirium). These symptoms, although each minor on its own, combined to create a catastrophic consequence. Despite Mr. B trying to be brave, replying “I’m OK” in response to his doctor’s queries, Karen’s husband died of a gastrointestinal bleed eight days after his surgery.

*Now, several years after her husband’s death, Karen is committed to supporting the BC health system to improve the quality and coordination of whole-patient care. In Karen’s words, “The patient’s care plan needs to be carried out across the entire medical team, regardless of who’s on shift, day or night. We need continuity and coordination of ‘full-person’ care. Many small things can go wrong and nobody notices until it’s a disaster. What can we do to make [full-person care] consistent throughout system?”*

After listening to Karen’s account of her late husband’s experience, the patient group overwhelmingly agreed to the following recommendations:

- The MRP (most responsible physician) shouldn’t necessarily be the surgeon as they are too specialized. Instead, there needs to be a “most responsible clinician” who will care for the whole patient
- The “most responsible clinician” should:
  - Have a very high level of medical training (e.g., nurse practitioner, hospitalist, or other physician).
  - Be responsible for the “whole patient.”
  - Help with medications, monitor side effects, etc.
  - Oversee hand-off of patient to clinical medical navigator.
  - Create feedback loops so that each unit or team is informed of patient outcomes/conditions. (i.e., how did things ultimately turn out?).
- A clinical medical navigator should be available to support patients. The navigator needs to be a doctor or have a VERY high level of medical training (e.g., nurse practitioner), not just a personal advocate or lay volunteer.
- Patients are trusting and expect they will be informed of important information by staff; therefore the onus is on the system to proactively inform patient of critical information.

## **6. Patient Feedback**

The focus group strongly advocated for improved mechanisms to gather postoperative patient feedback regarding the quality of care to help inform the system of opportunities for improvement.

Their suggestions regarding patient feedback include:

- Patients want hospitals to feedback on every patient’s outcome and experience, such as cleanliness of facilities, whether communication was clear, whether the patient felt listened to, whether the patient was comfortable, whether the patient felt prepared for discharge.
  - Use open-ended techniques such as “Tell us about your experience.”
  - Note that “satisfaction” is not the same as the patient’s “experience.”

- Patients would like the hospitals to clearly define “successful outcome” so that:
  - “A surgery is successful only when I am totally back to normal.”
  - “If a patient is readmitted following a surgery, the true cost and outcomes should be attributed appropriately (complications should not be considered ‘new’ events).”
- Patients want to know how the information is ultimately used.
  - What is the purpose of collecting the information?
  - How will patients be notified of changes or improvements to the system?
- Patients fear the consequences of completing feedback forms and whether their comments will affect their current or future care.
  - “We will be honest with our feedback if we feel safe doing so.”
  - “We don’t want busy ward staff punished.”

*“The patient is the only true generalist in the health care system, the only one that sees it all.”  
(PVN Participant)*

## **Summary**

It was generally agreed by the focus group participants that improvements in communication, planning, and continuity and quality of whole-patient care would help patients to feel safer with a greater sense of influence and control over their situation. This in turn would mitigate the anxiety and fear they feel in relation to their perioperative experience.

Some of their closing comments are noted here:

- “I am feeling empowered/hopeful.”
- “We are a diverse group here—Good!”
- “This opportunity to discuss change is so exciting/significant.”
- “This is meaningful and patients have power.”
- “Our voices are being heard.”
- “For all the bad stories today, the vast majority [of us] had very good results.”

The patient partners who engaged in the BCMA Perioperative Focus Group were very pleased with the opportunity to discuss change to the medical system. Any frustration the patients expressed was very much directed at the system’s limitations, and not at individual clinicians. The patients recognized that BC’s medical system is complex and faces innumerable challenges on many fronts. The patients in this focus group also recognized the dedication of the majority of clinicians working within the system who take pride in providing the best care possible.

Each of the patients who participated in this group believes strongly in the power of the “Patient Voice” to advocate for a patient-centred approach to care in a cohesive provincial system with a focus on quality and continuity of whole-patient care. In other words, “Treat the Whole Me.”

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