

CADTH Health Technology Review

# Single-Entry Models in Surgical Services

**Authors:** Jonathan Harris

**ISSN:** 2563-6596

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**Funding:** CADTH receives funding from Canada's federal, provincial, and territorial governments, with the exception of Quebec.

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## Key Messages

- In the health care system, common elements of SEMs include pooled referrals and waiting lists, centralized intake through a single-entry point, and triage for urgency and appropriateness.
- Four programs including the use of SEMs from the Canadian context were examined: the Winnipeg Central Intake System for hip and knee replacements, the British Columbia Surgical Strategy, the Nova Scotia Hip and Knee Action Plan, and the Saskatchewan Surgical Initiative.
- SEMs were generally implemented as 1 element of broader strategies to reduce surgical waits and enhance quality and safety of surgical services.
- Key success factors for implementation of SEMs included:
  - Concurrent investments in surgical capacity and health system resources.
  - The establishment of standardized clinical pathways to reduce care variation.
  - Strong leadership, including a focus on change management and use of clinician champions.
  - Standardized data collection and public reporting on key performance indicators.
  - Concurrent focus on quality improvement and patient-centred care.
- Challenges for implementation of SEMs included:
  - Effectively managing change and resistance to change.
  - Challenges in other areas of the health system that could impact wait times.
  - Maintaining strategic focus and predictable funding, especially in the face of external shocks.

## Issue

Single-entry models (SEMs) are an approach to waitlist management that have been used extensively in the Canadian and international context. There is a small body of evidence that shows SEMs contribute to reduced wait times and waitlist lengths. This briefing note examines 4 SEMs that have been implemented in the Canadian context and describes key success factors and challenges in SEM implementation.

## Background

Wait times for specialist care have been an area of strategic focus for Canadian health systems for many years. The 2016 Commonwealth Fund survey of a sample of citizens aged 18 and older found that self-reported wait times for specialist care and non-emergency surgeries in Canada were the highest among 11 comparable countries.<sup>1</sup>

Wait times for specialist care are measured in 2 components. The first part of the wait, classified as Wait Time 1, measures the time between a referral being made to a specialist and the patient being seen by the specialist. Wait Time 2 measures the time between a decision to treat being made by the specialist and the patient undergoing the treatment.

National benchmarks for wait times exist for priority procedures.<sup>2</sup> These benchmarks were developed by a committee convened in 2005 by the Canadian Institute for Health Information, that was tasked with collecting and reporting on wait time information on a national basis, and adopted by federal, provincial, and territorial governments.<sup>3</sup> For example, for hip and knee replacement scheduled cases (non-emergent or urgent cases) the benchmark Wait Time 1 is 3 months and Wait Time 2 is 6 months.<sup>4</sup> In 2019-2020, the national average for patients receiving a hip or knee replacement within 6 months was 72%. New Brunswick was 1 of 7 provinces that were below the national average, with only 45% of patients in need of hip or knee replacement undergoing surgery within the Wait Time 2 benchmark of 6 months.<sup>5</sup> Similarly, a 2020 study across 7 provinces and 1 territory found that New Brunswick's average wait to see any specialist following a referral from a primary care provider was a median of 105 calendar days, the longest of any jurisdiction studied.<sup>6</sup>

There are a variety of health equity considerations related to surgical waits. A 2009 gender-based analysis found that although both women and men underuse hip and knee replacement, women underuse the procedure at a rate that is 3 times greater.<sup>7</sup> It is hypothesized that this is because imaging underestimates the severity of arthritis and other causes of joint damage in women and because physicians are more likely to choose less aggressive treatment options than for men.<sup>7</sup> It is also thought that women may be unwilling to undergo joint replacement surgery because of concerns about a lack of post-surgical support or may delay necessary care because of their own caregiving responsibilities.<sup>7</sup> Additionally, socioeconomic status (SES) may impact one's ability to access primary or specialist care. A 2020 study of all elective surgeries in British Columbia found that although there was no significant association between lower SES and surgical wait times when adjusting for other factors such as health status and comorbidities, those of lower SES reported worse health by the time they were assigned to the surgical queue.<sup>8</sup> This likely indicates that lower SES individuals experience inequities during the wait time, and that they may be delayed in accessing the care needed to get to a surgical consult.

A variety of supply- and demand-side policy interventions have been implemented in decentralized health systems comparable to Canada's to manage wait times. Supply side interventions include funding additional surgeries and surgical capacity in the public health system, introducing activity-based funding models, contracting out to private providers, and improved waitlist management. Demand-side interventions include introducing explicit clinical guidelines for triage and prioritization.<sup>9</sup>

SEMs are 1 approach to waitlist management that have been used in the Canadian and international context.<sup>9,10</sup> The theory behind SEMs is rooted in queuing theory and it will be familiar to anyone who has ever queued up to see a bank teller or to check-in for a flight, where customers wait in a single line to see the first available teller or gate agent. In the health care system, common elements of SEMs include pooled referrals and waiting lists, centralized intake through a single-entry point, and triage for urgency and appropriateness.<sup>11</sup>

There is a small body of evidence as summarized in [this CADTH rapid response report](#) showing that SEMs contribute to reduced wait times and waitlist lengths.<sup>12</sup> No evidence-based guidelines were found for SEMs in the CADTH literature review. Understandably, this evidence is largely from observational, non-randomized studies, and authors of the single identified systematic review on the topic reported that the included studies were generally of low methodological quality.<sup>10,12</sup>

There are a number of notable examples of SEMs being implemented in Canada. These include:

- Winnipeg Central Intake System
- British Columbia Surgical Strategy
- Nova Scotia Hip and Knee Action Plan
- Saskatchewan Surgical Initiative

This briefing note will describe each of these provincial examples and examine the similarities, differences, and key success factors of each of these examples.

## Winnipeg Central Intake System

The Winnipeg Central Intake System (WCIS) for hip and knee replacement surgery was implemented in 2012.<sup>11</sup> The Winnipeg Regional Health Authority was, at the time the central intake system was conceived in 2011, performing 85% of all primary hip and knee replacements in Manitoba. At the time, Manitoba was 1 of the poorest performers on national Wait Time 2 benchmark for hip and knee replacement, with only 63% of hip replacements and 57% of knee replacements being performed within 6 months.<sup>11</sup> The objectives of the WCIS are to balance variation of total waiting time across specialists, to improve access by referring to the next-available surgeon, to optimize the referral process, and to determine the annual referral volumes for hip and knee replacements through centralized electronic management.<sup>11</sup> Key features of the central intake system include:

- A central office that serves as a point of contact for all stakeholders.
- A standard referral form circulated to all Manitoba physicians.
- Standard patient referral and screening criteria.
- Standard participation and referral allocation rules for surgeons.
- Standard pre-consultation questionnaire.
- Letters of acknowledgement of referral sent to patients and the referring physician.
- Patient information in the form of pamphlets, online videos, and in-person classes to educate patients before surgical consult.
- A waitlist tracking tool.
- A regional joint replacement registry.<sup>11</sup>

A 2018 study described the key success factors of the WCIS as identified by all members of the project team, including processing engineers, project sponsors, waitlist coordinators, managers, medical director, and policy-makers from both the Winnipeg Regional Health Authority and Manitoba Health. These included:

- **Strong communication**, including early and frequent consultation with all relevant stakeholders; transparent, clear, and consistent messaging around the changes being introduced; and clarity of vision, roles, responsibilities, and expectations.
- **Clear and robust data collection processes**, including centralized data collection and management, clear standardized criteria for referrals and triage, and reporting on key quality dimensions.

- **Physician leadership**, in the form of clinical champions supported by administrative leadership to help build trust, understand the concerns of colleagues, and advocate for the best interests of patients and the health system.
- **Patience**, including a commitment to iterative development and continuous improvement, combination of top-down and bottom-up change management strategies, and a recognition that it is necessary to convince those involved of the benefits to make changes to a deeply entrenched status quo more acceptable.<sup>11</sup>

Results from the WCIS have so far been promising, although research shows it took longer than anticipated to be fully established and operational.<sup>11</sup>

## British Columbia Surgical Strategy

In 2018, the Government of British Columbia announced a new, province-wide surgical strategy intended to reduce surgical wait times for priority procedures, the first 2 of which are hip and knee replacement and dental surgery.<sup>13</sup> The province committed \$75 million in the 2018-2019 fiscal year, increasing to \$100 million in 2019-2020.<sup>13</sup> The strategy for the provincial hip and knee replacement program is based on a smaller-scale initiative called the Richmond Hip and Knee Reconstruction Project, and incorporates a centralized intake, assessment, and triage process, including a single point of entry, standardized referral and assessment, access to the first available surgeon, and redirection to non-surgical services as appropriate.<sup>13</sup>

The 4 components of the British Columbia surgical strategy include:

- Addressing backlogs and long waits to catch up to demand. As 1 of the first target procedures, 5 new hip and knee replacement programs were established, 1 in each health region.
- Increasing annual volume of surgeries.
- Making system improvements, including optimizing the use of operating rooms, finding efficiencies to ensure that surgeries start and finish on time, and developing an SEM.
- Supporting existing and new staff by enhancing interdisciplinary care, enhancing capacity in non-surgical professions needed to support increased volumes (e.g., anesthesia, specialty nursing, perfusion, occupational therapy, and physiotherapy), and ongoing reporting and evaluation.<sup>13</sup>

Preliminary data did show improvements to wait times and the existing surgical backlog for hip and knee replacement in British Columbia, with 11% fewer patients waiting more than six months for surgery in 2019-2020 as compared to 2016-2017.<sup>14</sup> However, the pause in elective surgeries resulting from COVID-19 resulted in more than 5,000 lost orthopedic surgery cases between March 2020 and May 2020. As part of the province's Surgical Renewal strategy aimed at addressing the backlog from the pandemic, British Columbia has reiterated that hip and knee surgery will remain a strategic area of focus.<sup>14</sup>



## Nova Scotia Hip and Knee Action Plan

In October 2017, the Nova Scotia Health Authority (NSHA) announced the Hip and Knee Action Plan, aimed at reducing wait times and reducing variation in referral practices and pre- and post-surgical care across the province.<sup>15</sup> The Action Plan includes:

- Enhancing and expanding orthopedic assessment clinics, which includes creating new clinics in more communities, having these clinics be the entry point to connect patients to the care they need, and standardizing care in these clinics across the province.
- Expanding surgical capacity and teams.
- Creating a standardized care pathway for all hip and knee replacement sites in the province.
- Improving operating room scheduling.
- Improved measurement and reporting on targets and process, and improved public communication and engagement.<sup>15</sup>

In addition to the new standardized care pathway, a SEM including e-referral and centralized booking was introduced. NSHA has also introduced a new wellness model for inpatients after orthopedic surgery aimed at helping patients mobilize more quickly, with the goal of reducing length of stay.<sup>16</sup> Additionally, the Government of Nova Scotia has made a number of concurrent investments, including the recruitment of 8 new orthopedic surgeons and the creation of additional specialty residency seats at Dalhousie University Medical School.<sup>17</sup>

As of December 2019, hip and knee replacement surgeries had increased 7.3% year over year as compared with 2018.<sup>17</sup> NSHA also reported a 20.9% increase in the total number of hip and knee replacements between 2016-2017 (the first year of the action plan) and 2019-2020.<sup>16</sup>

## Saskatchewan Surgical Initiative

The Saskatchewan Surgical Initiative was a 4-year, province-wide program from 2010-2014 aimed at reducing surgical wait times across all specialties, improving quality and safety of surgical services, and improving patient experience.<sup>18</sup> The central principle of the initiative was a commitment that no patient would wait more than 3 months following specialist decision to treat for any surgery by 2014. The initiative involved several waitlist management reforms, including the creation of a centralized, provincial surgical registry, the introduction of clinical pathways to assist in triage and prioritization decisions, and pooled referrals for some surgical services.<sup>18</sup> The initiative also included supply side investments, including longer surgical hours, increased use of regional hospitals instead of provincial tertiary centres where appropriate, increasing health human resources and training spaces, and most controversially, contracting out some low-risk day surgical services to private, for-profit clinics.<sup>18</sup>

The Saskatchewan Surgical Initiative included the key components of SEMs (centralized intake, pooled referrals, and standard triage/prioritization methods), but did not cover all specialist groups in the province, as it was up to individual physicians whether to participate in the pooling of referrals.<sup>18</sup> Patient choice was also an important component of the initiative. Patients could choose whether to see the first available specialist or to wait to see the specialist of their choice. This choice was informed by the online specialist registry which

allowed the patient to see where they are on the waitlist as well as the wait times for all appropriate specialists, including the next-available specialist.<sup>18</sup>

The Saskatchewan Surgical Initiative was considered to be a success, despite not fully achieving the guarantee that no patient would wait more than 3 months. The Ministry of Health reported an 89% reduction in the number of patients waiting more than 3 months for surgery by 2015.<sup>19</sup> The number of patients on a waiting list for more than 3 months declined from 15,291 on March 31, 2010 (when the initiative began) to 1,678 on March 31, 2015.<sup>19</sup> Key success factors included strong leadership, including setting a clear, actionable, and understandable goals, transparency in consistently reporting on progress and performance indicators, and a concurrent focus on system integration and patient-centredness. The significant investments made in increasing surgical capacity were also necessary to achieve results.<sup>18</sup>

Although many of the core reforms of the initiative remain in place, some of Saskatchewan's progress on elective surgery waits has been lost in recent years. As the strategic focus on surgical waits has shifted and with government's capacity to invest at previous levels limited by declining resource revenues, wait times had, even before the impacts of COVID-19, begun to increase.<sup>18</sup> This underscores the importance of maintaining strategic focus and sustainable levels of investment over the medium term.

## Key Success Factors and Challenges

A comparison of the 4 example SEMs explored is shown in Table 1.

Based on these 4 examples, key success factors for SEMs in surgical services seem to be:

- **The development and implementation of a standardized clinical pathway or triage criteria** for the priority procedure that aims to reduce practice variation and provides clarity as to when and how a specialist referral should be made.
- **Concurrent investments in health system resources needed to deliver on clearing surgical backlog**, including increasing operating room and clinic capacity, expanding operating room hours, and increasing health human resources (including surgeons and all necessary staff to support surgical and post-surgical care).

**Table 1: Comparison of Provincial Single-Entry Models**

Program	Concurrent investment (in HHR, surgical space, utilization, etc.)	Specific to 1 specialty	Standardized clinical pathway or triage criteria	Based on a successful pilot program within jurisdiction
Winnipeg Central Intake System	Unknown	Yes	Yes	No
British Columbia Surgical Strategy	Yes	No <sup>a</sup>	Yes	Yes
Nova Scotia Hip and Knee Action Plan	Yes	Yes	Yes	Yes
Saskatchewan Surgical Initiative	Yes	Yes	Yes	No

<sup>a</sup>British Columbia's initial priority was hip/knee replacements and dental surgery, with the intent to apply learnings to other priority procedures in future years.

HHR = health human resources.

- **Leadership**, including setting clear, actionable, and measurable targets for wait times, involving clinical and health system champions to aid in change management, and following best practices for managing organizational and health system change.
- **Concurrent focus on quality improvement and system integration**, including focus on team-based care, enhancing quality and safety of surgical and post-surgical care, and putting the patient at the centre of any reform.
- **Data collection and transparency**, including standardizing data collection and reporting, and committing to regular public reporting on progress and key performance indicators.

Challenges in implementing or sustaining SEMs include:

- **Effectively managing change.** The Winnipeg Regional Health Authority officials noted that implementing their SEM took longer than anticipated, potentially as a result of insufficient system readiness for change. Effective implementation of an SEM involves collaboration and cooperation from across the health system, and upfront attention to how to communicate and manage this change seems crucial.
- **Pressures in other areas of the health system.** In a retrospective analysis of the Saskatchewan Surgical Initiative, former Saskatchewan Finance Minister Janice MacKinnon noted that although the initiative was successful in changing culture around surgical services, it did not necessarily go far enough to alleviate pressures or create change elsewhere in the health system. For example, preventive health care services including home care and access to allied health professionals may prevent some individuals from needing surgery at all, but access to these services is still limited by capacity. Access to primary care and team-based primary care models was also seen as something that could potentially prevent the need for some surgeries.
- **Sustaining funding, strategic focus, and momentum.** In the British Columbia and Saskatchewan examples, some of the progress achieved in reducing wait times and backlog was lost as a result of external shocks. In Saskatchewan's case, this shock was a sudden reduction in revenues as a result of low-world oil and other commodity prices that resulted in unforeseen budget constraints, meaning that previous year-over-year increases in the health budget were no longer sustainable. In British Columbia's case, the COVID-19 pandemic arrived just as the second year of their surgical strategy was wrapping up, resulting in the cancellation of many priority elective procedures. Although SEMs and other process improvements remain valuable in ensuring timely, appropriate and high-quality care, shocks like these can reduce funding and strategic focus, and ultimately cause lost momentum. Making true progress on wait times requires predictable multi-year funding and resolute commitment from health system leaders.

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