

# How Would We Know Whether Joint Replacements Are Successful if We Do Not Ask Patients?

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## Abstract

Joint replacements are among the most effective and most frequently performed surgeries in Canada. Patient-reported outcome measures (PROMs) are measurement instruments completed by patients about aspects of their health status, including pain and function. PROMs data from three provinces show that approximately nine in 10 patients report higher PROM scores after joint replacement surgery. These data can help identify factors that lead to better care and opportunities to further understand what contributes to a patient's perception of surgical success. Expanding the collection of PROMs to more patients and more provinces is needed to help healthcare planners and clinicians understand these important outcomes.

## The Changing Landscape of Hip and Knee Replacements in Canada

Joint replacements are widely known to be effective surgeries, improving mobility and quality of life for patients, particularly after many years of trying to manage chronic, debilitating pain. Hip and knee replacements are among the top three most common in-patient surgeries performed in Canada (58,635 hip and 58,443 knee replacements were performed in 2021–2022), leading to more than \$1.2 billion in hospital costs annually (CIHI 2023a). Although the number of joint replacement surgeries performed decreased during the COVID-19 pandemic, the number is increasing again, though the total number of surgeries performed is still below pre-pandemic levels (Figure 1). Accelerating the shift to more of these procedures being performed in day surgery has been one of the adaptations since the pandemic began as day surgery requires fewer hospital resources (e.g., hospital beds and overnight stays) than in-patient stays. With pressures on healthcare systems to address surgical backlogs and long wait times for these

surgeries, it is ever more important for health administrators and clinicians to ensure that patients having these surgeries have good outcomes to optimize the efficient use of healthcare resources.

The success of a joint replacement is often measured by how long the implant lasts before needing to be replaced, which is typically 15 to 20 years (CIHI 2023b). Given that a major primary indication of a successful joint replacement is improvement in mobility and reduction in pain, those aspects should also be measured when determining success. This information can only be collected using tools that gather information directly from patients.

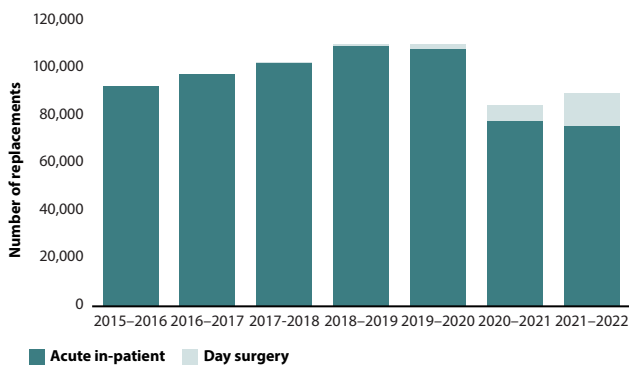
## Patient-Reported Outcome Measures

Patient-reported outcome measures (PROMs) are tools used to gather information from patients on their physical, mental and social well-being, and they consequently have the potential to:

- provide insight into the effectiveness of care from the patient's perspective;
- complement clinical and administrative outcome data to provide a more comprehensive assessment for evaluating the impact of these surgeries; and
- support improvements in the quality of care for surgical patients and more patient-centred health systems.

When monitored over time, PROMs can be used by health system decision makers to inform health services programming, planning and policies, as well as for performance measurement and quality improvement initiatives. PROMs are valuable to both clinicians and patients, providing a platform for patient-provider communication and expectation setting and health status monitoring.

**FIGURE 1.**  
**Number of hip and knee replacements for osteoarthritis**  
**by type of care in Canada, 2015–2016 to 2021–2022**



Includes hip and knee replacements with osteoarthritis as the most responsible diagnosis or main diagnosis.

Sources: Discharge Abstract Database–Hospital Morbidity Database and National Ambulatory Care Reporting System, 2015–2016 to 2021–2022, CIHI.

PROMs are categorized as follows:

- generic (applied across different populations) and typically an indicator of health-related quality of life and
- condition-specific (used to assess outcomes that are specific or unique to particular diseases or sectors of care).

National data collection standards for PROMs in hip and knee replacement (CIHI 2021) were published by the Canadian Institute for Health Information (CIHI) in 2017, and five provinces (Alberta, British Columbia, Manitoba, Nova Scotia and Ontario) have since adopted these standards for the collection of PROMs. The standards include a PROM specific for hip and knee replacements that was designed to measure pain and mobility, the Oxford Hip Score/Oxford Knee Score (the OHS/OKS) (Oxford University Innovation 2016a, 2016b), another PROM to measure health-related quality of life (the EQ-5D-5L) (EuroQol n.d.) and a single-item question to measure satisfaction with surgery. Collected both before and after the surgery, these instruments measure improvement, if any, as a result of having a joint replacement.

Hip and knee PROMs collection is underway and growing across Canada. Although PROMs data submitted to CIHI must adhere to standards to be included in national comparative reporting, approaches to administration and collection vary between and within jurisdictions. For example, in Ontario, PROMs are collected at the hospital level according to each unique care pathway (e.g., operations at large academic centres vs. small community sites – some with referral and assessment

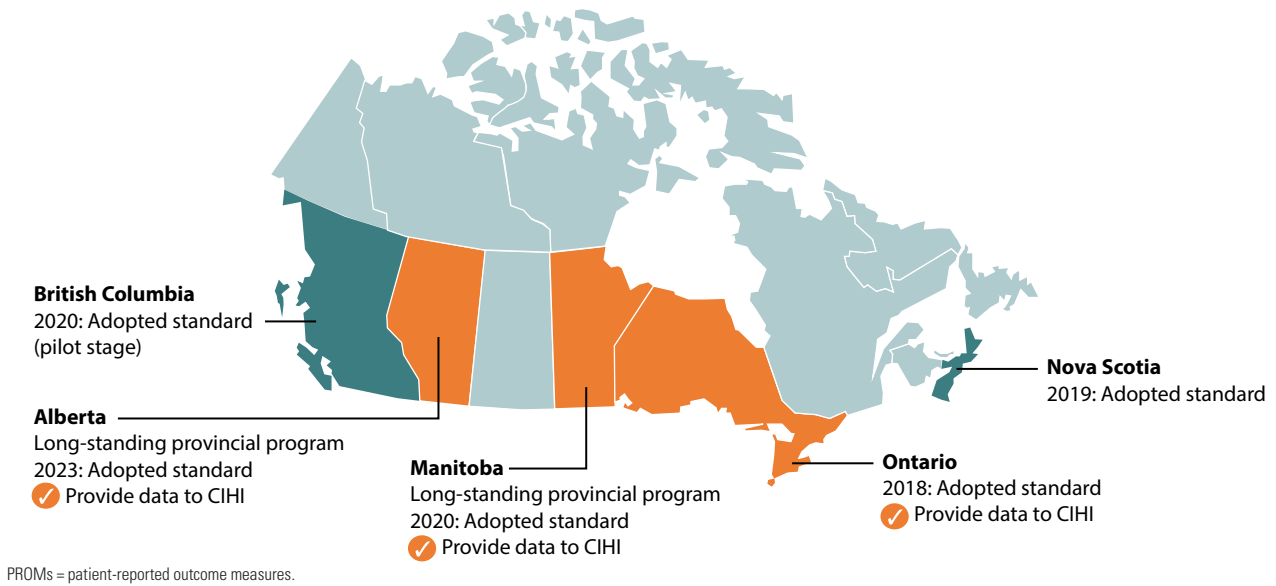
clinics and others without) by clinical, research or administrative staff or even volunteers. In British Columbia and Alberta, surgical planning and collection of PROMs are coordinated via a provincial central registration system. In terms of mode of collection, electronic collection is preferred and encouraged. Some jurisdictions provide electronic platforms on which patients can complete the PROMs on site (i.e., via a kiosk or tablet) or on a personal device. The use of technology has the potential to reduce administrative burden resulting in higher response rates and the elimination of transcription errors and supports timely access to PROMs information for use in direct patient care. However, not all hospitals have the resources or information technology infrastructure necessary to implement PROMs collection in this way; therefore, surveys can also be collected on paper or via telephone interview and transcribed into an electronic platform. To ensure successful PROMs collection, program planners should offer a variety of collection options that reflect variation in care models, human and financial resources, infrastructure, workflow and patient preferences (e.g., mode of administration and languages available).

A summary of the adoption of the national standards and submission of data to CIHI is illustrated in Figure 2. Data from adult patients in Ontario, Alberta and Manitoba have regularly been submitted to CIHI, where they can be linked to other CIHI databases for analysis and reporting. This article presents an analysis of PROMs data from these three provinces, exploring the 12-month change in patient-reported outcomes and patients' satisfaction with surgery.

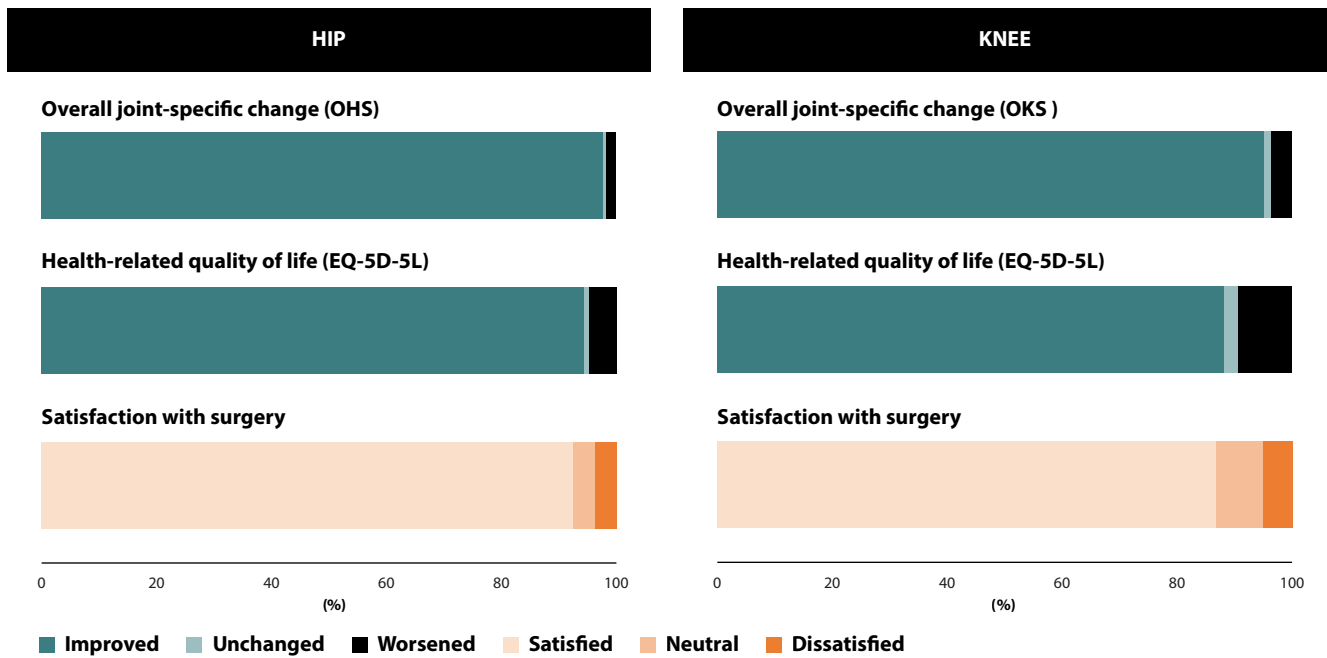
### Analysis of PROMs Data in Canada

PROMs were eligible for comparable reporting if completed by patients at least 20 years of age at the time of surgery; had an elective, primary (first implant) hip/knee arthroplasty; and had completed a pre- and 12-month post-operative PROMs survey within the standard time frame (up to two months pre-operatively and nine to 15 months post-operatively) from a subset of hospitals in Ontario, Manitoba and Alberta. Out of 4,129 hip and 4,761 knee replacement patients with PROMs data meeting the standard, approximately nine out of 10 patients reported a positive change in their pain and mobility (OHS/OKS) and health-related quality of life (EQ-5D-5L) after hip or knee surgery (Figure 3). Most hip (93%) and knee (87%) replacement patients reported feeling satisfied with their surgical results. These findings support evidence suggesting that the vast majority of patients report that they are satisfied with their hip or knee replacement; however, focusing on the small proportion of dissatisfied patients may help identify modifiable factors that can lead to improved outcomes.

**FIGURE 2.**  
Standards adoption and data collection for hip and knee PROMs in routine care in Canada



**FIGURE 3.**  
Twelve-month change in patient-reported outcomes and satisfaction with surgery, 2019–2020 to 2021–2022



EQ = EuroQol; OHS = Oxford Hip Score; OKS = Oxford Knee Score.  
 Improvement is based on the patient-reported outcome measures (PROMs) change score, which is the difference in score from pre-surgery to one year post-surgery. A change score greater than zero indicates an improved outcome, a change score equal to zero indicates an unchanged outcome and a change score less than zero indicates a worsened outcome. Not all positive change scores indicate a meaningful improvement to the patient.  
 Sources: PROMs data: Alberta Bone and Joint Health Institute, 2018–2019 to 2022–2023; Winnipeg Regional Health Authority, 2018–2019 to 2022–2023; and Ontario PROMs Program co-executed by Ontario Ministry of Health, Ontario Health and CIHI, 2018–2019 to 2022–2023.  
 Surgical data: Discharge Abstract Database and National Ambulatory Care Reporting System, 2019–2020 to 2021–2022, CIHI.

## A Call for Continued Focus on and Investment in PROMs

Collecting PROMs and satisfaction scores before and after surgery provides a measurable result on the effectiveness of joint replacements and a more complete picture of health gains for patients. PROMs for hip and knee replacement also support more informed patient prioritization and wait list management and help to further understand the complexities that contribute to a patient's perception of surgical success (e.g., judgements on the value of an intervention, patient-provider expectation setting and psychosocial experiences).

The changing environment of care (e.g., patients waiting longer and increasing use of day surgery) underscores the need to measure the effect these changes have on patient outcomes. Collection and analysis of PROMs data allow for an evaluation of whether patients experience similar outcomes when they receive the procedure as a day vs. in-patient surgery. Also, the effect of waiting longer to receive surgery and its potential impact on the outcome can be used to inform decisions on prioritizing patients. The potential of PROMs data to answer these questions as well as to ensure that patients are receiving the anticipated outcome is important for an efficient use of healthcare resources.

High-quality data for patients receiving a joint replacement are needed to be able to assess patient-reported outcomes effectively. Although substantial progress has been made,

more robust and comprehensive PROMs data collection across Canada, including higher rates of response, is needed to maximize the use of this information. Investments in data infrastructure, including technology (e.g., patient portals), and human resource supports (for tracking and follow-up) are required for successful implementation and to attain representative data to be able to make decisions about care models and patient groups.

## Conclusion

Our findings are a starting point, but more complete PROMs data collection and regular reporting are needed to truly assess the success of joint replacements. Over 100,000 joint replacements are performed each year that have the potential to make a substantial impact on a significant number of current and future patients. Ensuring that resources are used effectively is important to optimize the benefits these surgeries have for Canadians. **HQ**

## Acknowledgment

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