Title: Waiting time for hip and knee replacement and its association with poor post-operative outcomes: a research protocol

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Background: Total joint replacement (TJR), to treat osteoarthritis of the hip or knee, is one of the most common elective surgeries performed in Canada each year. Due to high demand for these procedures, patients can face significant wait times for TJR. Since 2004, hip and knee replacements have been identified as priority procedures for reducing wait times, with a target of waiting no more than six months for surgery. Despite improvements, many patients are still waiting longer than this benchmark, a situation worsened by reduced capacity to perform elective surgery during the Covid-19 pandemic. In 2021-2022 only 62% of patients in Canada received TJR within 6-months of joining a waitlist. Osteoarthritis is a degenerative disease that causes worsening pain and loss of function in the joint which can limit daily activities and lower quality of life. Patients who are referred for TJR may already be experiencing unmanageable symptoms when they are waitlisted for surgery. Prolonged wait periods may lead to further deterioration and, in turn, worse outcomes after surgery. The purpose of this research is to explore patient and health system factors associated with longer wait times for TJR and to assess the impact of wait time on patient outcomes after joint replacement.

Methods: We will create a retrospective cohort of adult patients, diagnosed with osteoarthritis, who underwent hip or knee replacement in Ontario between 2003 and 2020. Cohort data will include linked health administrative data from ICES including hospital visit data, OHIP billing data, and patient and provider demographic data. Wait time for TJR will be defined as the number of days from the patient's last orthopedic consult to joint replacement, a previously validated method of approximating wait time from administrative data. We will first assess factors that influence wait time for TJR with a multi-level linear regression with three levels for patient, surgeon, and hospital covariates. Multi-level regression analysis will also be used to assess the association of wait time with poor post operative outcomes. The primary outcome will be revision of the joint replacement within two-years of the primary procedure. Secondary outcomes will include length of stay, readmission to hospital within 90-days, mortality at 90 days and two years, opioid use in the year after surgery, a composite outcome of complication-related diagnoses within two years of surgery, and a composite outcome of any intervention on the joint within two years.

Discussion: We will determine whether certain demographics of patients are at risk for prolonged wait times and identify possible inequities in access to TJR in Ontario by exploring patient and health system factors associated with long waiting periods. We will also determine if waiting time is associated with negative outcomes after surgery, which will have implications for both patients and health service provision. The results of this research can inform current waitlist practices to help clinicians and policy makers better prioritize patients waiting for hip and knee replacements.