

Down syndrome and joint replacement: Risks for post-surgical complications

January 11 2024, by Isabella Backman



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One of the largest studies to date on post-operative outcomes for patients with Down syndrome following total knee replacement and total hip replacement surgeries was recently published by Yale researchers.

Down syndrome is associated with a range of musculoskeletal problems, some of which result in orthopedic complications that may require [joint replacement surgery](#). But for these patients, there is very little research on the risk of post-operative complications or the need for revision surgery after the initial operation.

Now, a new study finds that patients with Down syndrome were not more likely than the [general population](#) to undergo a revision surgery two years post-operation. Revision surgeries are follow-up procedures needed if the initial replacement fails. However, they were more likely to suffer adverse events from the surgery. The researchers [published](#) their findings in *JAAOS: Global Research and Reviews* in December.

"This is the first time that anyone has looked at patients with Down syndrome and their post-operative outcomes for total knee and [total hip arthroplasty](#) in such large numbers," says Scott Halperin, a fourth-year [medical student](#) at Yale School of Medicine and first author of the study.

People with Down syndrome are living longer than ever. Today, the [average life expectancy](#) is 60 years and climbing. In addition to musculoskeletal comorbidities, those with the [genetic disorder](#) are also more likely to have conditions including [congenital heart disease](#), immunodeficiencies, and blood disorders. This may put these patients at higher risk of adverse events following a surgery.

No additional need for joint revision surgery

In this new study, Halperin and his team used a national, multi-insurance administrative claims database called PearlDiver, which contained a cohort of 151 million patients at the time of the study. They first identified patients who had undergone a [total hip replacement](#) or [total knee replacement](#) between 2010 and 2021.

From this cohort, they looked for patients who also had been diagnosed with Down syndrome. For patients who had received a total hip replacement, they identified 492,551 without Down syndrome and 157 with Down syndrome. For total knee replacement, they identified 1,152,719 patients without Down syndrome and 151 with Down syndrome.

Then, the team matched patients with and without this additional diagnosis. "We tried to make those populations as similar as we possibly could, except one group had Down syndrome and one didn't," says Halperin. They considered factors including age, sex, and comorbidities. After matching, for total hip replacement, the cohort included 1,532 patients without Down syndrome and 154 with Down syndrome. For total knee replacement, there were 1,495 patients without Down syndrome and 150 with Down syndrome.

The researchers next compared 90-day post-operative outcomes and two-year revision rates between the groups. Importantly, they found no significant difference between the revision rates. "What that tells us is that from an orthopedic perspective, the surgery was successful," says Halperin.

However, patients with Down syndrome were at a significantly greater risk of experiencing adverse events, including sepsis, [urinary tract infections](#), acute kidney injury, and pneumonia. Halperin says this may be because Down syndrome is also associated with immunodeficiencies that can make patients more susceptible to these complications.

Careful monitoring after the operation is important

The findings support that a total hip replacement or total knee replacement can be beneficial for patients with Down syndrome. However, they say clinicians should monitor this group more carefully

post-operation for signs of infection. Administering longer or more intense courses of antibiotics may be one option for mitigating some of the adverse effects, according to the researchers. "The moral of the story is not to stop doing these procedures," says Halperin. "But we also need to limit the downsides as much as we can."

In future research, the team is interested in studying the health outcomes for patients with Down syndrome in other orthopedic procedures, including for the spine, hands, and ankles. Halperin hopes their ongoing work will shed light on the need for health outcomes research for this population and lead to more prospective studies. "Our goal is to better serve all of our patients, including patients with Down syndrome."

More information: Scott J. Halperin et al, Patients With Down Syndrome and Total Hip and Total Knee Arthroplasty: Outcome Measures Show Increased Risk of Perioperative Complications, *JAAOS: Global Research and Reviews* (2023). [DOI: 10.5435/JAAOSGlobal-D-23-00108](https://doi.org/10.5435/JAAOSGlobal-D-23-00108)

Provided by Yale University

Citation: Down syndrome and joint replacement: Risks for post-surgical complications (2024, January 11) retrieved 27 April 2024 from <https://medicalxpress.com/news/2024-01-syndrome-joint-surgical-complications.html>

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