



PRESS RELEASE (2025/11/27)

How fast you can walk before hip surgery may determine how well you recover

Researchers report that patients who can walk at least 1 meter per second before hip replacement have significantly better mid-term postoperative outcomes.

Fukuoka, Japan—Total hip arthroplasty (hip replacement) is a common treatment for hip osteoarthritis, a degenerative joint disease caused by cartilage in the hip joint wearing down. However, clinical outcomes vary between patients, and the best timing for surgery remains unclear.

Now, researchers at Kyushu University have identified that pre-surgery walking speed is a strong predictor of post-surgery outcomes. In a study published on 26 November in [*The Journal of Bone and Joint Surgery*](#), they found that patients who could walk at least 1 meter per second (m/s) before surgery were significantly more likely to report good postoperative results.

"Among all the factors we examined, gait speed stood out as the most consistent and reliable predictor of better recovery," says first author, Dr. Yuki Nakao, a medical doctor and PhD student in the [Department of Orthopaedic Surgery](#) and the [Graduate School of Medical Sciences](#). "Its simplicity also makes it a practical measure that clinicians can easily incorporate into their routine preoperative assessment."

Osteoarthritis, which is the most common form of arthritis, is a growing issue that affects more than 500 million people worldwide. It often causes severe pain and joint stiffness and significantly impacts quality of life. For hip osteoarthritis, total hip arthroplasty, where surgeons replace the damaged joint with an artificial one, is an effective but last-resort treatment. However, determining the right time for surgery remains difficult. Doctors typically rely on factors such as pain intensity or the severity of osteoarthritis as assessed by hip X-rays, but research has been inconclusive about whether these criteria reliably predict good postoperative outcomes.

To address this gap, Nakao and colleagues, including [Associate Professor Satoshi Hamai](#) and [Professor Yasuharu Nakashima](#) from the [Faculty of Medical Sciences](#), aimed to identify preoperative factors that could predict mid-term, patient-reported outcomes 5–10 years after surgery.

The researchers analyzed data from 274 patients who underwent total hip arthroplasty for osteoarthritis at Kyushu University Hospital between 2012 and 2018. All patients completed detailed physical assessments the day before surgery, including measurements of pain level, the hip's range of motion, lower-limb muscle strength, and a 10-meter walking test. In August 2023, these patients then answered two standardized post-questionnaires: the Oxford Hip Score, which assesses pain and hip function; and the Forgotten Joint Score-12, which measures the patient's awareness of their hip joint and level of discomfort.

To determine which patients had achieved a meaningful recovery, the research team used established Patient Acceptable Symptom State (PASS) thresholds. Patients who scored at least 42 points on the OHS and at least 50 points on the FJS-12 were considered satisfied with their surgical outcome.

The researchers then analyzed their outcomes against 15 different factors, including their age

at surgery, sex, BMI, duration of symptoms, length of follow-up period, and severity of osteoarthritis based on preoperative hip X-rays. They also used the physical assessments measured on the day before surgery, including the 10-meter gait speed test.

“While we saw a few significant factors emerge for each questionnaire in isolation, gait speed was the only significant factor across both questionnaires, highlighting its reliability,” says Nakao.

To gain deeper insight, the team also used machine learning to group patients into three clusters based on their questionnaire responses: those with excellent, moderate, and poor outcomes.

When the researchers looked at which factors best predicted an excellent outcome, walking speed was the only significant predictor, with a gait speed of about 1.0 m/s marking the key threshold separating those with excellent recovery from everyone else.

Although the research has limitations as it can only identify associations rather than causes, gait speed’s strength and reliability as a predictor of surgery success, along with how easy it is to measure, make walking tests a promising tool for future clinical practice. Gait speed could help physicians determine when to refer patients for surgery, and preoperative rehabilitation programs could be developed to help patients reach a walking speed of at least 1.0 m/s.

“We hope that bringing this knowledge into clinical practice will support better recovery and ultimately improve outcomes for patients undergoing hip replacement surgery,” Naoko concludes.

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For more information about this research, see “Preoperative Gait Speed as a Predictor of Patient-Reported Outcomes after Total Hip Arthroplasty: Insights from Patient Acceptable Symptom State and K-means Clustering Analyses” Yuki Nakao, Satoshi Hamai, Satoshi Yamate, Toshiki Konishi, Shinya Kawahara, Goro Motomura, Takeshi Utsunomiya, Yasuharu Nakashima, *The Journal of Bone and Joint Surgery*, <https://doi.org/10.2106/JBJS.25.00542>

About Kyushu University

Founded in 1911, Kyushu University is one of Japan's leading research-oriented institutions of higher education, consistently ranking as one of the top ten Japanese universities in the Times Higher Education World University Rankings and the QS World Rankings. Located in Fukuoka, on the island of Kyushu—the most southwestern of Japan’s four main islands—Kyushu U sits in a coastal metropolis frequently ranked among the world’s most livable cities and historically known as Japan’s gateway to Asia. Its multiple campuses are home to around 19,000 students and 8,000 faculty and staff. Through its VISION 2030, Kyushu U will “drive social change with integrative knowledge.” By fusing the spectrum of knowledge, from the humanities and arts to engineering and medical sciences, Kyushu U will strengthen its research in the key areas of decarbonization, medicine and health, and environment and food, to tackle society’s most pressing issues.

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