What problems did the researchers set out to study, and why?
The researchers set out to quantify the biomechanical changes in patients following total knee arthroplasty (TKA) during a sit-to-stand (STS) movement and to compare these changes with preoperative functional status and with a group of control subjects. Assessing recovery after TKA should include both the patient's perspective and performance-based measures, but only a few trials have examined performance-based recovery, and no previous trials have examined performance from a biomechanical perspective.

Who participated in this study?
Sixteen patients with end-stage knee osteoarthritis followed by unilateral TKA and 16 age-matched and body weight–matched control subjects were included in the study. The patients were required to be free from obvious signs of contralateral knee osteoarthritis.

What new information does this study offer?
This trial provides biomechanical data that a TKA can improve a patient's ability to load their limbs equally during a STS movement. A smaller but still significant improvement in angular knee velocity also was noted; however, some deficits in angular velocity compared with the control subjects persisted. The improvements were mostly noted during the first 6 months after the operation.

What new information does this study offer for patients?
Patients can expect improvement in their ability to rise to standing from a seated position following TKA by the sixth month after the operation. The improvements that were noted included being able to more evenly load the limbs and generating more upward speed during standing. Physical therapists may use the sit-to-stand movement to assess functional recovery during the rehabilitation process.

How did the researchers go about this study?
The researchers utilized a motion analysis system to capture data on maximal angular knee velocity and weight shift during a STS movement. They used a loading ratio to determine the symmetry of loading during the movement and compared the patients, operated and nonoperated limbs, and compared the patients' loading rate to that of a group of control subjects. Pain was recorded on a visual analog scale.

How might the results be applied to physical therapist practice?
This trial suggests that the STS movement can be used by researchers and clinicians as a performance-based measure to assess functional status in patients following TKA.

What are the limitations of the study, and what further research is needed?
The patients were not perfectly matched to the control subjects, so comparing the 2 groups could be a source of error. Future research should focus on validating these results and establishing other measures of biomechanical performance-based measures of function in this patient population, such as gait symmetry or speed.

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