

# Prehabilitation better prepares patients for knee replacement surgery

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An exercise program designed by researchers at the University of Louisville for patients with severe knee arthritis improves leg strength and patients' functional ability before knee replacement surgery, according to recent report in *The Journal of Strength and Conditioning Research*.

The study, led by UofL's Ann Swank, Ph.D., CSCS, and Robert Topp, Ph.D., R.N., says gains from exercise before knee replacement or prehabilitation may translate into improved recovery after surgery.

"We designed this program to be easily transferred to a home environment," Swank said. "It is very possible for many patients preparing for [knee replacement surgery](#) to participate in this exercise program and experience increased strength and functionality such as getting up from a chair or climbing stairs."

However, Swank noted the prehabilitation program did not significantly improve functional tasks such as walking speed or going downstairs.

The study included 71 patients scheduled for knee replacement surgery because of severe [osteoarthritis](#) that could not be managed with pain medications. Osteoarthritis of the knee is a very common condition in [older adults](#), causing pain and gradual declines in the ability to perform everyday tasks. When pain becomes so severe that medications no longer provide relief, knee replacement surgery is the only option. By that time, reduced leg strength may be present for several years—not only

decreasing functional ability, but increasing the risk of falls.

One group of participants was randomly assigned to a comprehensive prehabilitation program, consisting of light resistance training, flexibility and step exercise, and light walking.

Patients in this "pre-rehab" group exercised three times per week, in the clinic and at home, for four to eight weeks before knee replacement surgery. Patients in the comparison group received standard preoperative care, with instructions to continue their usual activities. The two groups were compared for knee strength and performance on standard functional tests.

When tested one week before surgery, patients who went through the prehabilitation program showed improvements in several areas. In particular, they had a 10 percent increase in extension strength in the leg scheduled for knee replacement. In contrast, the comparison group had a 10 percent decrease in extension strength.

In addition, patients in the prehabilitation group had less pain when performing the functional tests. For patients receiving standard care, performance on some functional tests actually decreased in the weeks before surgery—possibly reflecting increased pain scores.

The results show significant improvements in strength and functioning in the weeks before knee replacement surgery. Strengthening of the leg undergoing knee replacement may be a particularly important factor—exercise may reduce the strength imbalance between legs, therefore contributing to the functional improvement. The researchers do note that even with exercise, the surgical leg remains significantly weaker than the other leg.

Previous studies have evaluated exercise programs to improve leg

strength and functional ability before knee replacement surgery, but with limited success.

Although the study did not compare postoperative recovery, increases in leg strength and performance of functional tasks before knee replacement surgery may result in improved postoperative recovery because preoperative performance of functional tasks has been shown to be a predictor of postoperative performance of functional tasks, Swank said.

Topp noted that in addition to the clinical aspects, there is the potential for cost-savings as well.

"The next step in this research is to determine whether this comprehensive prehabilitation exercise program translates to a savings in healthcare dollars," Topp said. "For example, reducing the number of days a patient stays in the hospital or reducing the number of physical therapy sessions."

Provided by University of Louisville

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