

# Obesity associated with longer hospital stays, higher costs in total knee replacement patients

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Obesity is associated with longer hospital stays and higher costs in total knee replacement (TKR) patients, independent of whether or not the patient has an obesity-related disease or condition (comorbidity), according to a new study published in the *Journal of Bone and Joint Surgery* (JBJS).

More than half of TKR patients have a body mass index (BMI) within the obesity range (greater than 30 kg/m<sup>2</sup>), which has been linked to a higher risk for related comorbidities such as diabetes, hypertension, osteoarthritis; and in some studies, to higher medical costs and longer hospital stays. However, research has been inconclusive as to whether the higher related medical costs in obese TKR patients are directly due to a higher BMI or related comorbidities.

In the *JBJS* study, researchers reviewed the BMI, comorbidities, complications, outcomes and cost of care of 8,129 patients who had undergone 6,475 primary TKRs and 1,654 revision TKRs at a major medical center between Jan. 1, 2000 and Sept. 30, 2008. The median patient age was 68. Fifty-seven percent of the patients who underwent primary TKR and 53 percent who underwent revision TKR were female. The mean patient BMI was 31.6 kg/m<sup>2</sup>.

Among the key findings of the research:

- The most common patient comorbidities were hypertension and diabetes.
- Length of stay and direct medical costs were lowest for patients with BMI values in the normal to overweight range.
- Every 5-unit increase in BMI beyond 30 kg/m<sup>2</sup> was associated with higher hospitalization costs: in 2010 U.S. dollars, approximately \$250 to \$300 for patients undergoing TKR and \$600 to \$650 for patients undergoing a revision joint replacement. These estimates persisted after adjusting for comorbidities and complications.
- Every 5-unit increase in BMI beyond 30 kg/m<sup>2</sup> was associated with a mean hospital stay that was .11 days longer for patients undergoing primary TKR and .06 days longer for patients undergoing revision TKR. The data was the same for patients with and without comorbidities.

"The higher costs associated with obesity are believed to be largely due to managing comorbid medical conditions linked to obesity, such as diabetes," said lead study author Hilal Maradit-Kremers, MD, an associate professor of epidemiology at Mayo Clinic in Rochester, Minn. And yet in this study, "even in the absence of comorbidities, patients with obesity had longer stays and higher hospital costs."

"The bottom line is that obesity is increasingly common among [patients](#) undergoing joint replacement, which creates a myriad of technical and medical challenges, and likely contributes to the financial burden of the surgery," said senior author David G. Lewallen, MD, an orthopaedic surgeon, also from Mayo Clinic.

## Study Details

In the study, patient data on clinical and surgical characteristics and complications were obtained from the original medical records and the

institutional joint registry. Patients were classified into eight groups based on their BMI at the time of surgery. Direct medical costs were calculated in 2010 U.S. dollars by using standardized, inflation-adjusted costs for services and procedures billed during hospitalization within a 90-day window. Data on hospital length of stay and direct [medical costs](#) were compared across the eight BMI categories in both unadjusted and multivariable risk-adjusted analysis. Linear regression models were used to determine the cost impact associated with increasing BMI and [obesity](#) accounting for comorbidities and complications.

Provided by American Academy of Orthopaedic Surgeons

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