Knee replacement surgeries take more time, are more costly in overweight individuals

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Knee replacement surgery takes far more time to conduct in overweight and obese patients than in normal weight patients, according to recent research at Hospital for Special Surgery in New York. The study will be presented at the American Academy of Orthopaedic Surgeons annual meeting, held Feb. 15-19 in San Diego, Calif. The study has implications for hospital staff scheduling surgeries, operating room utilization and personnel staffing, and also raises the question of whether knee replacements should be reimbursed based on time.

"When we schedule surgery, the body mass index is never considered," said Geoffrey Westrich, M.D., an adult reconstruction and joint replacement surgeon and co-director of Joint Replacement Research at Hospital for Special Surgery who led the study. "If I have four or five knee replacements in a day, they will just put them on the OR schedule but they don't look at whether a person is heavy or obese class II or obese class III. What this study shows is that the utilization is greatly increased. If you have a 20 percent greater utilization for someone who is obese and if you multiply that by five or six knee replacements over the course of a day, at the end of the day the operating room staff could be finishing up two hours later. In many cases, the hospital has to pay the staff overtime which greatly increases hospital expenditures."

Obesity causes a variety of health problems, including an increased need for total knee arthroplasty (TKA) or knee replacement surgery—extra weight puts extra stress on knees. Researchers at Hospital for Special Surgery wondered whether weight might impact the time it took to

perform a knee replacement. "Intuitively, one would think that as people get heavier, knee replacement surgery may be more difficult and more time consuming because the fatty tissue makes surgery more difficult," Dr. Westrich said. "Now that we have collected data on the different stages of knee replacement surgery, we wanted to use the objective data to determine if there was an increase in the time of surgery based on a patient's weight and whether we could correlate a patient's weight or BMI with the different steps of knee replacement surgery."

The investigators retrospectively reviewed a consecutive series of 454 TKAs conducted by one surgeon at HSS between 2005 and 2009. They categorized patients into groups based on the World Health Organization classification of body mass index: normal weight 18.5-25 kg/m2, overweight 25-30 kg/m2, obese class I 30-35 kg/m2, obese class II 35-40 kg/m2, and obese class III >40 kg/m2. The investigators then correlated weight with five factors: anesthesia induction time, tourniquet time, time spent surgically closing the knee after completing the procedure, total surgery time, and total amount of time spent in the operating room. The tourniquet time is measured from the time of the initial incision, includes the time it takes to implant the knee prosthesis, and ends when the bone cement is hard. The closure time is not included in the tourniquet time.

The investigators found that as BMI increased, so did the time it took to perform all parts of the surgery. "As BMI increased, surgery times progressively increased," Dr. Westrich said. In patients who were a healthy weight, the overall room time was two hours and increased as weight category increased; for obese class III patients, it was two hours and 24 minutes, a difference that was 20 % greater and highly statistically significant. In comparing normal weight to obese class III patients, the times were also greater for obese patients in total room time (24 minutes, P