Introduction: Evaluation of hospital readmissions after total knee arthroplasty (TKA) may provide an opportunity for improved patient safety and cost reduction. Despite the established effectiveness of TKA for treatment of arthritis, it is a very costly procedure. Thus, it is of great interest to find ways of reducing costs while ensuring that patient safety and outcomes are not compromised. The equipment, personnel and facilities needed for TKA comprise some of the costs, but the postoperative hospital stay is a significant contributor. Factors contributing to the length of hospital stay after TKA include preoperative, intra-operative as well as postoperative variables. Some of these causes of increased postoperative stay are more modifiable than others. Previous studies of risk factors associated with prolonged hospital stay after TKA have described female gender, increasing age, comorbidities, obesity, higher American Society of Anesthesiologists-Physical Status scores, longer incisions, longer operative time, the need for transfusion and postoperative complications as having significant associations with increased stay.

Length of postoperative hospital stay is decreasing for a broad variety of operative procedures. The causes are likely multifactorial, and may include the introduction of less invasive procedures, the implementation of rigid perioperative patent safety protocols, and streamlining of postoperative care by the implementation of evidence-based practices. It has been suggested that reductions in postoperative hospital stay in TKA would be an effective cost-reducer and would not adversely affect outcomes. Concerns have been raised, however, that reductions in length of hospital stay may be made at the expense of other postoperative outcomes, possibly causing prolonged stay at rehabilitation units, increases in adverse events after discharge, or the increasing the need for readmission.

In this study we used medical record abstraction and administrative claims data from hospital charts of Medicare beneficiaries who underwent TKA from 2002-2007 to investigate the rates and reasons for postoperative readmission as well as the length of postoperative stay (LOS). We hypothesized that a reduction in length of hospital stay would lead to an increase in the rate of readmission. We also investigated the causes of readmission in this patient population.

Methods:

Data
The data were collected as part of the Medicare Patient Safety Monitoring System (MPSMS), which is a nationwide surveillance project aimed at identifying the rates of specific adverse events (AEs) in Medicare beneficiaries through the identification of adverse events from inpatient medical records and administrative claims data. The Centers for Medicare and Medicaid Services and the Department of Health and Human Services Patient Safety Task Force led the coordination and development of the MPSMS. The MPSMS sample is a subset of the Hospital Payment Monitoring Program (HPMP) record sample. The HPMP sample is randomly selected each month, from the Medicare National Claims History (NCH) File by the Centers for Medicare and Medicaid Services, from a pool of approximately 1 million Medicare beneficiary hospital discharges across 50 states, Washington DC, Puerto Rico and the Virgin Islands. The study sample was drawn from the MPSMS database, which includes more than 180,000 hospital discharges between January 1, 2002 and December 31, 2007. From within this larger sample we selected the records of all 4057 patients that had a total knee arthroplasty for degenerative arthritis during their hospitalization.

Outcomes
For this study, our primary outcomes of interest were total length of hospital stay in days and 30-day readmission rate. Length of stay was calculated as a difference between dates of discharge and admission. If a patient was discharged at the same date as admission, his/her LOS was defined as one. The rate of all-cause 30-day readmission was calculated from the NCH database by counting the total number of first re-hospitalizations per 100 discharges within 30 days after discharge from a hospitalization that included a TKA procedure. We also noted the recorded causes for the readmissions by International Classification of Diseases, Ninth Revision (ICD-9) code.

Results:
The overall rate of readmission in the 30 days after discharge was 228/4057 (5.6%). The ten most common reasons for readmission were: congestive heart failure (21%), chronic ischemic heart disease (14%), cardiomyopathy (13%), pneumonia (11%), osteoarthritis (9%), general symptoms (7%), acute myocardial infarction (7%), care involving other specified rehabilitation procedure (6%), diabetes mellitus (6%), and disorders of fluid, electrolyte, and acid-base balance (6%). There was no difference in the rate of readmission from 2002-2004 (5.5%) to 2005-2007 (5.8%) (OR 1.08, 95% CI 0.88-1.32, p=0.46). The overall mean LOS was 3.9 ± 1.9 days. There was a significant reduction in LOS from 2002-2004 (4.1 ± 2.0 days) to 2005-2007 (3.8 ± 1.7 days) (OR 1.27, 95% CI 1.25-1.29, p=0.0001).

Conclusions: A reduction in LOS was not associated with an increase in the rate of readmission. Cardiac complications were the most common reason for readmission (55%). Future efforts to optimize cardiac status prior to discharge may lead to lower rates of readmission.

References:
Husted H, Holm G. Fast track in total hip and knee arthroplasty--experiences from Hvidovre University Hospital, Denmark; 37 Suppl 5:S31-5.