

Outpatient Total Joint Arthroplasty: An Overview

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Introduction

Outpatient (<24 hour stay) total joint arthroplasty (TJA) has emerged as an acceptable cost-effective alternative to traditional inpatient TJA.^{3,7,13-15,20} Advances in anesthesia, perioperative analgesia, post-operative rehabilitation and surgical techniques have contributed to decreased length of stay and early post-operative mobilization.^{5,8,28} The demand for total hip arthroplasty (THA) and total knee arthroplasty (TKA) is projected to increase significantly over the next 20 years.²² In a 2005 study, outpatient TJA was shown to be a cost-saving measure when compared to inpatient TJA.⁹ However, there are few studies analyzing cost or cost-savings of outpatient TJA performed in a free-standing ambulatory surgery center (ASC).

While outpatient TJA has been successful in select patient populations when performed in a hospital setting,^{3,7,13-15,20} increasing numbers of orthopedic practices are performing TJAs in free-standing ASCs. However, few studies report results and experience of TJA in the ambulatory setting.²⁵ Concerns about ambulatory ASCs include the possibility for increased rates of complications and hospital admission, early and unplanned follow up, and transfer to an inpatient facility for treatment of complications.^{8,12,19,20,23,27} Additionally, certain patients are disqualified from undergoing a TJA at an ASC if they meet certain exclusion criteria. A recent study retrospectively reviewed the charts of 3,444 patients undergoing TJA, and found that 70.3% of patients were eligible for treatment in an ASC.¹⁸ The most common exclusion criteria included high BMI (>40kg/m²; 32.66%), severe comorbidities such as cardiorespiratory diseases, diabetes, or infections (28%), and untreated obstructive sleep apnea (25.2%). Patient reported outcomes in the past have revealed favorable comparisons to inpatient controls at follow-up of 24 months.²⁰ Little data on outpatient TJA outcomes has been presented thus far in the literature. The following is a summary of pertinent outpatient TJA topics obtained from a large cohort of patients from the Humana database with patient procedures (CPT 27447) from 2007 to 2015.¹

In the studies referenced in this report, 8,961 total joint arthroplasty procedures were performed in a total of 8,807 patients. There were 4,473 total hip arthroplasties (49.9%), and 4,488 total knee arthroplasties (50.1%) performed. Overall, 4,932 were inpatient procedures (55.0%), and 3,875 were outpatient (43.0%).

Complications

Complications requiring extended stay can arise in outpatient TJA procedures. Certain comorbidities, such as coronary artery disease, chronic obstructive pulmonary disease, and prostatic hyperplasia are associated with increased risk of complications.⁴ Common complications in patients undergoing TJA included dislocations, wound complications and infections, gastrointestinal bleeds, stress fractures, pneumonia, and thromboembolic complications.^{2,6-8,12} A study comparing the complications arising within 30 days of surgery found that bleeding requiring transfusion (6%), wound drainage or infection (1%), and superficial surgical site infection (0.5%) were the most common outpatient TJA complications, while bleeding requiring transfusion (12%), urinary tract infection (1%), and wound drainage or infection (1%) were most common in inpatient procedures.¹² Of the studies reporting complication rates, outpatient procedures had an overall complication rate of 3.5% (89/2,522) compared to 11.3% (399/3,544) for inpatient procedures.

Readmissions/ER visits

Complications that arise after TJA procedures sometimes require a visit to the emergency room (ER) or hospital readmission depending on severity. Of the 8,807 TJA patients, the overall readmission rate was 3.6% (19/535) for inpatient procedures and 2.0% (53/2,586) for outpatient procedures. ER visits were not widely reported, but overall, studies report 2 visits with a 1.0% ER visit rate for inpatient procedures and 11 visits with a 1.2% rate for outpatient procedures. The most common reasons for a visit to the ER were wound complications, infections, fractures, and blood clots.^{6-8,10,14}

Financial Comparison

Over 400,000 Medicare patients received an inpatient or outpatient hip or knee replacement in 2014, with costs ranging between \$16,500 and \$33,000 per joint for the procedure, hospital stay, and recovery.^{21,24} Factors that can reduce costs included a shortened hospital stay, and fewer complications.²³ In a small study, financial analyses have shown that the average hospital bill for outpatient procedures range from \$4,000 to \$6,800 less than for inpatient procedures.^{3,9} A study of costs based on length of hospital stay found that the costs associated with outpatient procedures and patients staying in the hospital for 1-2 days were \$8,527 and \$1,967 lower than patients staying for 3-4 days, respectively.²³ After 2 years, the outpatient group and patients staying 1-2 days reported less pain and stiffness, respectively, although the 1-2 day stay group had a higher risk for requiring a revision.²³ Ambulatory surgical centers have shown to provide an 84% average reduction in cost compared with hospital outpatient departments.²⁵ Goyal et al. demonstrated that because a significant percentage of patients (24%) planning to have outpatient surgery were not able to be discharged the same day, facilities to accommodate an overnight stay should be available.¹⁴

Cost differences between inpatient and outpatient procedures have fluctuated over time. In comparisons between same-day discharge and hospital inpatient procedures, a study from 2002 found that inpatient procedures cost \$4,000 more than outpatient.⁹ A Medicare sample of patients receiving a total knee arthroplasty procedure between 1997 through 2009 found that at two years, costs associated with the outpatient group were \$8,527 lower than the inpatient group.^{9,23} An observational case-control study from 2008 to 2011 showed the cost difference to be \$6,800,³ and a prospective study from 2012 to 2013 found that inpatient procedures cost \$3,155 (or 33%) more than outpatient procedures.^{3,17} This indicates that cost differences are significant relative to procedural costs, but have ranged widely and more systematic study is necessary to determine trends in cost differences between inpatient and outpatient procedures.

Limitations

There were several limitations in the included studies. For example, several studies were not randomized controlled studies.^{7,15,20} Another common shortcoming was a lack of a control population.^{1-3,7,16,23} Often, patients selected for outpatient or accelerated protocols were more likely healthier or younger than those selected for inpatient procedures, introducing the possibility for significant selection bias.^{3,8,10,26,27} Additionally, the number of patients selected for outpatient procedures and short hospital stays were small compared to inpatient procedures and longer length of stay.^{1,11} Specific inclusion criteria used by studies, such as BMI, age, and sex, may not match the majority of patients seen in any given surgeon's practice.²⁶ Lastly, it was common that some patients who were initially designated as outpatient requested overnight hospitalization.⁸ Therefore, the outcome and complications rates reported may not accurately represent the entire patient population.

Conclusion

In general, studies of TJA treatment have demonstrated that appropriately selected patients can undergo TJA in an outpatient setting with low risks of complication or readmission. Patient age, weight, and BMI do not appear to be limiting factors for outpatient arthroplasty, but readmissions may be higher in select groups, so a stringent screening process is recommended.⁶ Outpatient TJA protocols can offer acceptable short-term results that are comparable to conventional inpatient protocols for appropriately indicated patients, but there is a risk of unplanned readmission, which must be weighed against the benefits and potential cost savings of outpatient TJA.²⁷

References

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