

Outpatient Total Joint Arthroplasty-Can It Be Done Safely? : A Review



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Abstract

Total knee arthroplasty and total hip arthroplasty are one of the most successful procedures treating patients with later stage of osteoarthritis. With an improvement of patient care, in every step from pre-operation, intra-operation and post operation, the length of hospital stay is decreasing to a few days and lastly, in outpatient service. We reviewed the current literatures about outpatient arthroplasty, to determine what you should know before doing an outpatient total joint arthroplasty, results and complications.

Keywords: outpatient, day-surgery, total knee arthroplasty, total hip arthroplasty

Total knee arthroplasty (TKA) and total hip arthroplasty (THA) are among the most successful orthopedic procedures with a 15 year-survival rate of more than 90% in most studies.^{1,2} They have traditionally been considered as inpatient surgical procedures. Historically, the inpatient stay exceeded several weeks. With multiple improvements including surgical techniques, anesthesia and implementation of clinical pathways, the length of stay (LOS) in the hospital has substantially decreased to a few days.^{3,4} The reasons that keep patients in hospital care postoperatively include patient and physician concerns about uncontrolled pain, delayed mobilization and possibility of perioperative complications.^{5,6} However, more recent studies⁷ indicate that there are no differences between longer hospital stays, short hospital stays and outpatient surgery. Berger et al have reported successful outpatient total knee arthroplasty without an increase in perioperative and early postoperative complications.⁸ The studies which reported the outpatient arthroplasty results defined an outpatient as a patient discharged within 23 hours.^{8,9}

Why outpatient arthroplasty?

Historically, it was thought that an extended acute hospital stay for several weeks was the best way for patients to recover and achieve a good outcome after total joint arthroplasty. However, there are studies that show with early discharge protocols,^{10,11} patients can recover safely and faster than previously thought, and this decreases inpatient workload and subsequent cost. Moreover, patients discharged quickly have comparable outcomes to patients who remain admitted for the standard hospital stay of 5-10 days. Bertin¹² has reported that outpatient THA costs average 4,000 USD less than inpatient surgery. Lovald et al.⁷ have compared the incremental payment for osteoarthritis and attributable costs at 2 years and reported that costs were approximately 8,527 USD lower for the outpatient group.

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Key to success in outpatient arthroplasty

To initiate and accomplish outpatient arthroplasty surgery, the roadblocks need to be understood. Studies¹³⁻¹⁵ show that patient fear or anxiety about the unknown, not knowing what is going to happen, and fear of pain are major obstacles as well as patient co-morbidities. For the surgeon, the side effects of the treatment from narcotics or anesthesia, blood loss or surgical trauma are concerning and indications for keeping the patient in hospital care under observation.^{10,16} For all of these reasons, good clinical pathways and protocols are crucial.

Preoperative care

Patient selection is the first and most important step to success in outpatient arthroplasty. In addition to the history and physical examination by the surgeon, the patient's home status should be also assessed to determine whether the patient has any support to help them move around the house safely after surgery.¹⁷ Patients with a history of diabetes, myocardial infarction, stroke, congestive heart failure, venous thromboembolism, cardiac arrhythmia, respiratory failure, chronic pain requiring regular opioid medications or patients who are on anti-coagulation therapy should not be considered candidates for outpatient total joint surgery as they were excluded from some of the studies.^{8,9} Lovald et al.¹⁸ has reported increased risk of revision, infection, accidental falls, wound complications, and death in patients with poorer health status (i.e. with a higher Charlson score). However, patients with ischemic heart disease or diabetes were not associated with increased risk for re-hospitalization, death, revision, infection, or DVT. Courtney et al.¹⁹ have reviewed 1,012 consecutive patients undergoing elective primary hip and knee arthroplasties and reported the independent multivariate risk factors for developing late (> 24 hours) complications included COPD (adjusted OR 4.16), CHF (adjusted OR 9.71), CAD (adjusted OR 2.80), and cirrhosis (adjusted OR 8.43).

Co-morbidities and any surgical risks of the patient should be evaluated carefully and cleared by a team of internal medicine specialists who are familiar with out-patient procedures and aware of factors that would make an outpatient procedure undesirable.^{5,20}

There are studies²¹⁻²⁵ that confirm that a significant aspect to consider is patient education which involves giving the patient appropriate goals and expectations, education about the surgical procedure and potential complications, the entire expected hospital course and postoperative care especially for pain control and ambulation. Reviewing the patient's questions and particularly addressing the patient's needs are necessary steps to improve postoperative patient satisfaction and outcome.

Pre-arthroplasty rehabilitation further educates patients about what is expected from them after the operation, such as how patients are going to move the operated extremity, how to use a cane or crutches, and what to expect in the perioperative phase. Patients who receive pre-arthroplasty rehabilitation education have been shown to have significantly better post-operative outcomes regarding strength, recovery and function²⁶ and also tend to save on hospital-related expenditure and have a shorter length of stay in the hospital.^{22,27,28}

Perioperative care

The main perioperative goals are prevention and prompt treatment of pain, nausea, and hypovolemia. It is better to manage these issues before symptoms arise. Premedication and perioperative protocols are varied in details between published studies, but all try to avoid using narcotics and aim to keep the patient well hydrated.^{8,9,29-31}

The choice of anesthesia for outpatient arthroplasty varies according to surgeon, anesthesiologist, and institution. Multimodal pain management including spinal anesthesia, local nerve block, intravenous narcotics and anti-inflammatory drugs have been shown to have significantly better post-operative pain management results.³²⁻³⁷

Tranexamic acid administration has also been demonstrated to safely reduce perioperative blood loss in hip and knee arthroplasty³⁸⁻⁴¹ and to reduce blood transfusion requirements which are one of the main problems that keep patients in the hospital.

The operative intervention itself should be smooth and efficient, but not hurried. Less invasive approaches and techniques have been reported to have significantly decreased pain and improve outcomes especially in the short term.⁴²⁻⁴⁴

Post-operative care

Physical therapy is usually started a few hours after surgery, soon after patients are assessed for vital signs and nausea. If any signs of hypovolemia or nausea are present, these should be treated promptly.^{8,45} The draining tube can be used in an effort to reduce wound complications⁸ and is typically removed 4 hours post-operation in the recovery room. However, there is a study⁹ that did not use the draining tube and reported no wound complication.

Patients will be discharged to return home only if all discharge criteria are met satisfactorily. To meet the criteria, patients must have stable vital signs, be able to eat regular diet and oral medication, and complete a formal physical therapy protocol. This protocol requires

that patients can independently transfer out of bed to standing and into bed from standing, rise from a chair to standing and sit from standing, ambulate 100 feet in distance, and ascend and descend a full flight of stairs.

After being discharged, patients will follow the care plan explained preoperatively. Pain is managed with oral narcotics and anti-inflammatory agents. Patients are seen by a home health nurse and therapist on the first post-operative day. Patients will be seen by the surgeon 1 week post operation and thereafter as a usual follow up.

Current published results

Most of the out-patient total joint arthroplasty studies have reported more than 90% success in discharging patients home within 23 hours without postoperative short term complications and less than 1% readmission due to pain, nausea or hypotension (Table 1).^{8,9,29,30} Lovald et al.⁷ have reported significantly less pain (31.7% vs 43.5%) in the outpatient group compared to the standard stay (3-4 days) group, but had higher 90 days infection (2% vs 1.9%), dislocation (0.4% vs 0.3%) and readmission rates (0.9% vs 0.5%). However, none of these differences are considered significant.

Table 1: Results of outpatient arthroplasty.

Study	Year	Operation	Patient	Follow up	Result
Berger et al. ⁸	2005	TKA	50	3 months	48 (96%) discharged within 23 hours 5 (10%) readmission within 30 days
Kolisek et al. ⁹	2009	TKA	64	24 months ¹²⁻⁴¹	62 (100%) discharged within 23 hours 0 (0%) readmission within 30 days 1 peroneal nerve dysfunction 1 genu recurvatum 10 months post op 1 tibial plateau fracture 1 year post op 2 manipulations
Berger et al. ³⁰	2009	THA	150	Minimum 3 months	150 (100%) discharged within 23 hours 0 (0%) readmission within 30 days 7 (4.67%) emergency visits
Dorr et al. ²⁹	2010	THA	69	6 months	53(77%) discharged within 23 hours 0 (0%) readmission within 30 days

TKA – Total knee arthroplasty, THA – Total hip arthroplasty

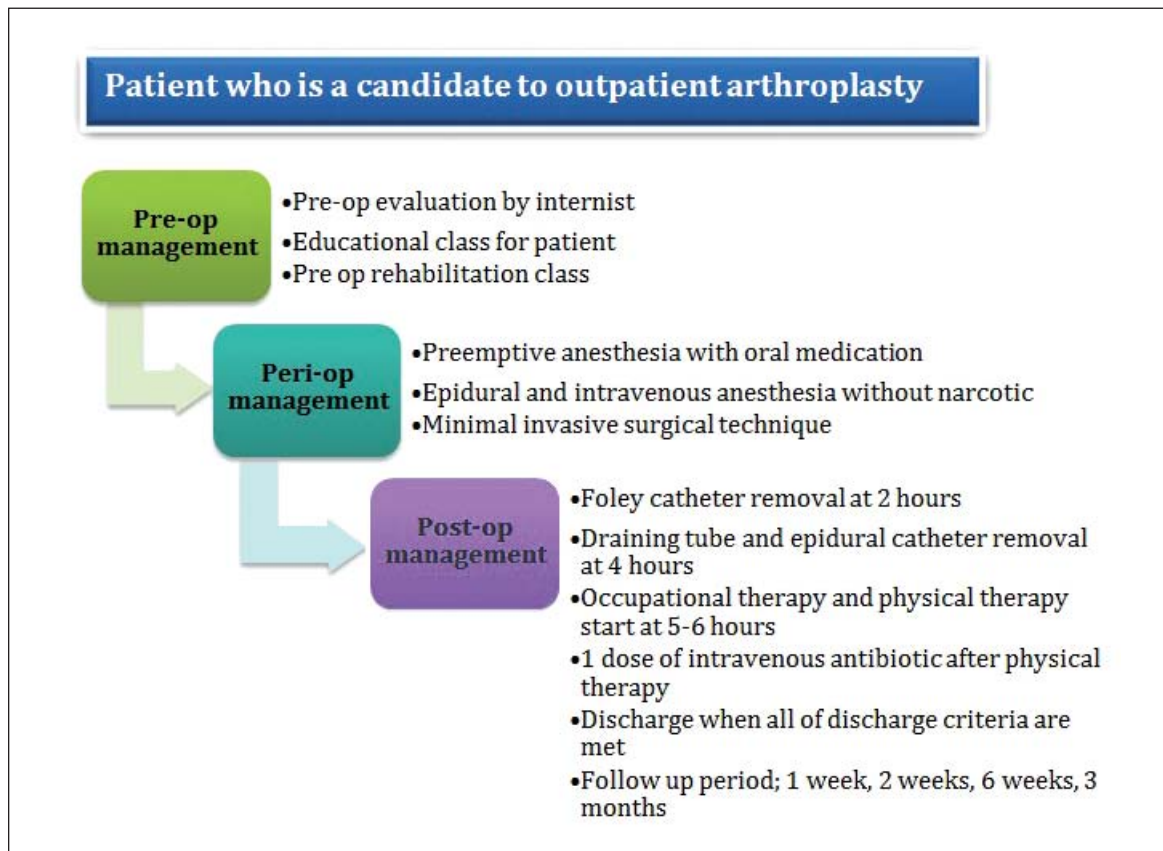
Conclusion

A trend of outpatient arthroplasty is emerging. It has already been established for orthopedic procedures which were formerly done as inpatient procedures such as upper extremity surgery, arthroscopy and anterior cruciate ligament reconstruction. The potential benefit is that patients can recover in their own home with reduced inpatient services. Outpatient arthroplasty involves multiple and specialized protocols for preoperative, peri-operative and postoperative care. The surgeon's role will change from the physician in the hospital to coordinator of the entire care experience.

Those interested in performing outpatient arthroplasty should initially aim to reduce the length of stay to 2 days. After a successful protocol and clinical pathway implementation, once a 1 day discharge can be achieved safely, then a same day discharge may be considered.

With careful patient selection and good clinical pathways, outpatient total joint arthroplasty can be done safely. However, current clinical studies have demonstrated only short term follow-up outcomes. Further studies with longer term follow-up and larger patient number are needed.

Diagram shows patient management flow chart summary from Berger et al.⁸



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