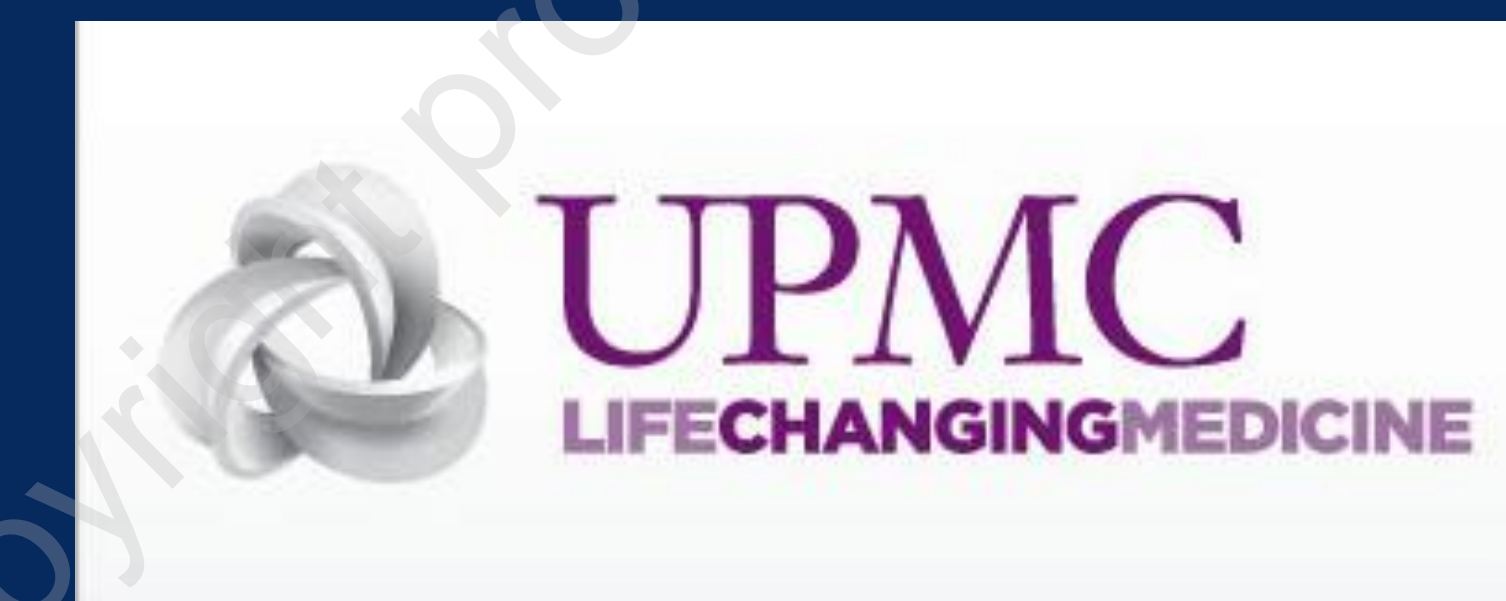




Total Joint Arthroplasty as an Ambulatory Surgery: Proof of Concept



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BACKGROUND and METHODS

Background- The current economic climate of rising healthcare costs combined with an increased utilization of our healthcare system, requires that steps towards healthcare savings are taken. An aging population suggests that the trend of increased joint replacements will continue into the next decades. Our clinical pathway for minimally invasive hip and knee replacements provide a unique opportunity to increase savings while simultaneously serving patients with a safe and life improving procedure. We present updated data on our minimally invasive total hip arthroplasty (THA) as well as new data demonstrating the concept of total knee arthroplasty (TKA) as an ambulatory surgery in non-preselected patients.

Materials and Methods- Between Jan 1st, 2011 and August 30th, 2011 we reviewed our IRB approved database for non-preselected patients scheduled for unilateral minimally invasive total knee or hip surgery. Each patient undergoing a total knee replacement received preoperative placement of a femoral and sciatic catheter bolused with 20 ml of ropivacaine 0.2% (femoral) or 10 ml of normal saline (sciatic). Each patient undergoing a total hip replacement received preoperative placement of a lumbar plexus catheter bolused with 20 ml of 0.2 % ropivacaine. Intraoperative management usually consisted of spinal with sedation but general anesthesia was used less frequently if desired by the patient. In the recovery room the perineural catheter was infused with either bupivacaine 0.0625% at 5 ml/hr (femoral/lumbar plexus) or bupivacaine 0.0325% at 3 ml/hr (sciatic). The nurses were encouraged to bolus 3 ml/hr in femoral or sciatic catheters depending on the distribution of pain prior to administering any narcotic medication. Each patient also was given access to oxycodone 5 mg for moderate breakthrough pain and 10 mg for severe pain. The patient would be discharged based on criteria from the surgeon, acute pain service, and physical therapy.

Results

Minimally Invasive TKA and THA from January 1, 2011- August 30, 2011

Discharged the day following surgery

THA- Total 69.1%

94/188 (50 %) discharged home <24hrs after surgery

36/188 (19 .1%) discharged home between 24hrs-36hrs after surgery

TKA-Total 64.4%

16/149 (10.7%) discharged home < 24 hrs after surgery

80/149 (53.7%) discharged home 24hrs-36hrs after surgery

These were not preselected patients, all patients were eligible for discharge if meeting a series of criteria including adequate analgesia and pre-established functional end points (walking with a crutch or a cane) .

Day of Discharge	Male/Female	Age (yrs)	Weight (kg)	Height (cm)	Primary/Secondary
<1	51/43 (94)	63/63.5	93/78	176/161	94/-
1-2	14/31 (45)	61/65	77/80	162/161	40/5
>/=3	19/30 (49)	65/72	101/73	172/160	28/18

Table 1: Day of Discharge for Total Hip Arthroplasty and Pt. Characteristic

REFERENCES

- Berger RA, et al. The feasibility and perioperative complications of outpatient knee arthroplasty. Clin Orthop Relat Res. 2009 Jun;467(6):1443-9
- Berger RA, et al. Minimally invasive quadriceps-sparing TKA results of a comprehensive pathway for outpatient TKA. J Knee Surg. 2006 Apr; 19(2):145-8
- Berger RA et al. Outpatient total knee arthroplasty with minimally invasive technique. J Arthroplasty 2005 Oct'20(7 suppl 3):33-8
- Mears DM, et al. THA with a minimally invasive technique, multimodal anesthesia and home rehabilitation. Clin Orthop Relat Res 2009 467:1412-17.

Day of Discharge	Male/Female	Age (yrs)	Weight (kg)	Height (cm)	Primary/Secondary
<1	12/4 (16)	63/63	94/74	177/162	16/-
1-2	43/43 (86)	63/65	102/89	175/164	82/4
>/=3	19/28 (47)	68/63	86/86	177/159	41/6

Table 2: Day of Discharge for Total Knee Arthroplasty and Pt. Characteristics

Discussion

The difference between the procedures discharge times could be because of the difference in surgical trauma and the implementation of the hip program before the knee program. We first reported only 44% of THA being discharged within 24 hours back in 2005. The improvement can be explained by increased experience at our institution with the minimally invasive total joint program. It can be expected that the knee program will improve with time also. With an aging baby-boomer generation, it should come as no surprise that the number of hip and knee replacement procedures have skyrocketed. The Nationwide Inpatient Sample (NIS) shows that primary hip replacements increased by 48% from 153,080 procedures in 1997 to 225,900 in 2004. First-time knee replacements grew by 63% from 264,331 in 1997 to 431,485 in 2004. According to HCUPNet, 228,332 patients received total hip replacements in 2006, and 496,077 patients received total knee replacements in 2006. If these trends continue, an estimated 600,000 hip replacements and 1.4 million knee replacements will be carried out in 2015. It is estimated that by 2030, the number of knee replacements will rise to more than 3.4 million. First time replacement procedures have been increasing equally for males and females; however, the number of procedures has increased at particularly high rates among people age 45-64 years. We demonstrate that total joint replacements can be done as an ambulatory procedure. The projected cost savings to the UPMC system for each < 24hr discharge is approximately \$1500. Considering the nation-wide increasing financial burden, of medical care, this is a powerful way to provide responsible cost-savings in our health care system.