

Does Discharge Disposition After Primary Total Joint Arthroplasty Affect Readmission Rates?

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Abstract: We reviewed 90-day readmission rates for 9150 patients with a primary total hip or knee arthroplasty performed between April 2001 and December 2004. Patients with an American Society of Anesthesiologists score of 3 or greater or with perioperative complications were excluded. We correlated the readmission rate with discharge disposition to either skilled nursing facilities (SNFs) or Home. Of the 9150 patients identified, 1447 were discharged to an SNF. After statistically adjusting for sex, age and American Society of Anesthesiologists scores, total hip arthroplasty and total knee arthroplasty patients discharged to SNFs had higher odds of hospital readmission within 90 days of surgery than those discharged home (total hip arthroplasty: odds ratio = 1.9; 95% confidence interval, 1.2-3.2; $P = .008$; total knee arthroplasty: odds ratio = 1.6; 95% confidence interval, 1.1-2.4; $P = .01$). Healthy patients discharged to SNFs after primary total joint arthroplasty need to be followed closely for complications. **Keywords:** total hip, total knee, skilled nursing, readmission, complications.
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The creation of the prospective payment system under Medicare was the driving force behind the practice of early discharge from hospitals [1]. Since then, numerous papers have noted that there is little difference in functional outcome between patients discharged home and patients who are sent to skilled nursing facilities (SNFs), even after total hip arthroplasty (THA) [1,2].

Because patients are being discharged earlier through the use of SNFs and aggressive home rehabilitation protocols, we need to ask if there is a difference in the relative rates of 90-day hospital readmission between patients who are discharged home with Home Health and Physical Therapy and those discharged to a SNF after an uncomplicated primary total joint arthroplasty.

To answer this question, we conducted a retrospective study of the effects of discharge disposition (home vs SNF) on 90-day hospital readmissions for all THA or knee

joint arthroplasty procedures performed in our health plan's hospitals in Southern California between April 2001 and December 2004.

Materials and Methods

The patients were identified using the Kaiser Permanente Total Joint Replacement Registry. Patient age, sex, and American Society of Anesthesiologists (ASA) score were abstracted from the Registry database. Discharge disposition, admitting and discharge *International Classification of Disease, Ninth Revision* diagnosis, hospital length of stay (LOS), complications, and hospital readmissions within 90 days of the surgery were obtained from the hospital database. Inclusion criteria included all primary total knee arthroplasty (TKA) and THA procedures performed at Kaiser Permanente Southern California hospitals within a 3-year period (2001-2004). We excluded patients with ASA scores greater than or equal to 3 to control for differences in comorbidities. Patients with complications during the initial hospital stay were also excluded from the study because complications during the initial hospitalization could predispose patients to subsequent hospital readmissions. Fig. 1 displays the final sample after applying the study inclusion and exclusion criteria.

Author S.B. evaluated all hospital readmission discharge codes to identify hospital readmissions related to the total joint procedure (Table 2). All diagnoses that could be related to the index procedure were further coded as 'surgical' or 'medical' complications based on

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Submitted February 26, 2008; accepted November 14, 2008.

No benefits or funds were received in support of the study.

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0883-5403/08/2501-0022\$36.00/0

doi:10.1016/j.arth.2008.11.007

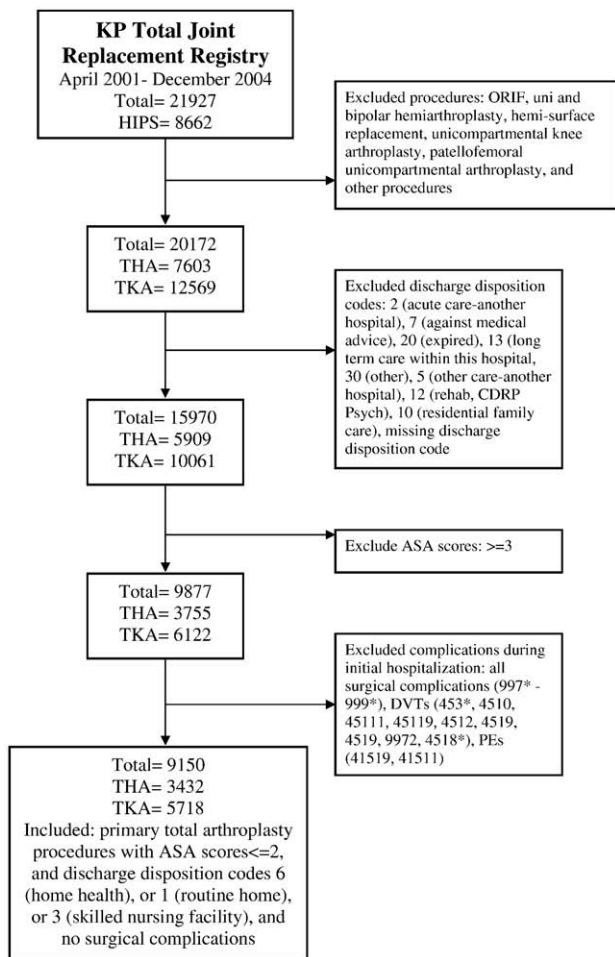


Fig. 1. Study inclusion and exclusion criteria.

whether the complication was primarily related to the procedure itself (eg, anemia) or to a comorbidity (eg, myocardial infarction) (Table 4). Readmissions due to any event that could not be construed as related to the index procedure were excluded (eg, diagnosis of bladder cancer).

Descriptive statistics consisted of means and SDs for continuous variables and frequencies and percentages for categorical variables. χ^2 and Fisher exact tests were used to evaluate categorical variables. The Mann-Whitney test was used to compare group ages, initial LOS, and ASA scores. Multivariate logistic regression was used to estimate adjusted odds ratios (ORs) for each of the covariates (patients' age, sex, and ASA score) in determining hospital readmission within 90 days of the total joint procedure. All reported *P* values are 2-sided and are considered to indicate statistical significance if *P* value is less than .05. The statistical software package SPSS 14.0 (Chicago, IL) was used to analyze the data.

Results

The cohort consisted of 3432 THAs and 5718 TKAs. Of the 3432 THAs, 2840 were discharged home and 592 to an SNF. For TKAs, 4863 were discharged home and 855 to an SNF. Table 1 displays the patient demo-

Table 1. Patient Demographics, Distribution of ASA Scores, and Mean LOS for Initial Hospitalization by Disposition at Discharge

	Discharged Home	Discharged to SNF	Total
Age, mean (SD)			
THA	63 (12)	73 (10)	65 (12)
TKA	66 (9)	73 (9)	67 (10)
Sex (% female)			
THA	53	73	58
TKA	63	68	64
ASA score			
THA (%)			
ASA 1	8	3	7
ASA 2	92	97	93
TKA (%)			
ASA 1	5	3	5
ASA 2	95	97	95
Initial hospitalization LOS, mean (SD)			
THA	3.62 (0.91)	3.46 (0.98)	3.61 (0.92)
TKA	3.62 (0.94)	3.72 (1.3)	3.63 (1.0)

graphics of patients discharged home vs those discharged to an SNF. Skilled nursing facility patients were significantly older (73 vs 63; *P* < .001), had a higher ASA scores (THA: ASA 2 97% vs 92%, *P* < .001; TKA: ASA 2 97% vs 95%, *P* < .05), and were more predominately female (*P* < .001). Total hip arthroplasty SNF patients had a shorter initial hospital LOS than those discharged home (*P* = .002). The average LOS was 3.6 days for both THA and TKA (Table 1).

Readmission rates after THA in this cohort were 2.9%, and for TKA 3.5%. Patients discharged to an SNF had a higher rate of hospital readmissions within 90 days than patients discharged home (TKA 4.4% vs 3.3%, *P* = .10; THA 5.2% vs 2.4%, *P* < .001). Although hospital readmissions for surgical reasons did not differ significantly between patients discharged to home vs SNF, THA and TKA patients discharged to SNF had higher rates of readmissions due to medical complication (THA *P* < .001, TKA *P* = .006) (Table 2).

The adjusted ORs for THA and TKA patients indicate that the odds of hospital readmission within 90 days of surgery is higher for patients discharged to SNFs than those discharged home (THA: OR = 1.9; 95% confidence

Table 2. Readmissions and Complications for Total Arthroplasty Procedures by Disposition at Discharge

	Discharged Home	Discharged to SNF	Total
Readmitted			
THA	69 (2.4%)	31 (5.2%)	100 (2.9%)
TKA	162 (3.3%)	38 (4.4%)	200 (3.5%)
Reason for readmissions			
Surgical complication			
THA	51 (1.8%)	17 (2.9%)	68 (2%)
TKA	119 (2.4%)	20 (2.3%)	139 (2%)
Medical complication			
THA	19 (.7%)	14 (2.4%)	33 (1%)
TKA	49 (1%)	18 (2.1%)	67 (1.2%)

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