

Current Evidence Does Not Support Medicare's 3-Day Rule in Primary Total Joint Arthroplasty

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Abstract

Patients who undergo total joint arthroplasty and are destined for discharge to an extended-care facility—particularly Medicare beneficiaries—are required to have an inpatient stay of at least 3 consecutive days. The primary objective of this study was to explore the effect of this policy on length of stay. Secondary outcomes were 30-day readmission rate and inpatient rehabilitation gains.

We retrospectively reviewed 284 consecutive cases of patients who underwent primary total hip or knee arthroplasty and were discharged to an extended-care facility.

Based on readiness-for-discharge criteria, delaying discharge until postoperative day 3 increased length of stay by 1.08 days ($P < .001$) and had no effect on risk for 30-day readmission ($P = .073$). Although rehabilitation status improved with stays past discharge readiness ($P = .038$), the gains were not clinically sufficient to affect discharge destination.

This study calls into question the validity of Medicare's 3-day rule in primary total joint arthroplasty. Larger, prospective, multicenter studies are needed to confirm these findings.

Medicare beneficiaries' demand for total hip arthroplasty (THA) and total knee arthroplasty (TKA) has increased significantly over the past several years, with recent studies reporting 209,945 primary THAs and 243,802 primary TKAs performed annually.^{1,2} With this demand has come an increase in the percentage of patients discharged to an extended-care facility (ECF) for skilled nursing care or acute rehabilitation—an estimated 49.3% for THA and 41.5% for TKA.^{1,2} To qualify for discharge to an ECF, Medicare beneficiaries are required to have an inpatient stay of at least 3 consecutive days.³ Although the basis of this rule is unclear, it is thought to prevent hasty discharge of unstable patients.

We conducted a study to explore the effect of this policy on length of stay (LOS) in a population of patients who underwent primary total joint arthroplasty (TJA). Based on a pilot study by our group, we hypothesized that such a statutory requirement would be associated with increased LOS and would not prevent discharge of potentially unstable patients. Specifically, we explored whether patients who could have been discharged earlier experienced any later inpatient complications or 30-day readmission to justify staying past their discharge readiness.

Materials and Methods

Institutional review board approval was obtained for this study. Between 2011 and 2012, the senior authors (Dr. Wellman, Dr. Attarian, Dr. Bolognesi) treated 985 patients with Current Procedural Terminology (CPT) codes 27130 (THA) and 27447 (TKA). Of the 985 patients, 287 (29.13%) were discharged to an ECF and were included in the study. Three of the 287 were excluded: 2 for requiring preadmission for medical optimization and 1 for having another procedure with plastic surgery. All patients were admitted from home on day of surgery and had a standardized clinical pathway with respect to pain control, mobilization, and anticoagulation. Physical therapy and occupational therapy (PT/OT) were initiated on day of surgery and were continued daily until discharge.

The primary outcome was discharge readiness, defined as meeting the criteria of stable blood pressure, pulse, and breathing; no fever over 101.5°F for 24 hours before discharge; wound healing with no concerns; pain controlled with oral medications; and ambulation or the potential for rehabilitation at the receiving facility. Secondary outcomes were changes in PT/OT progress, medical interventions, and 30-day readmission rate. PT/OT progress was categorized as either slow or steady by the therapist assigned to each patient at time of hospitalization. Steady progress indicated overall improvement on several measures, including transfers, ambulation distance, and ability to adhere to postoperative precautions; slow progress indicated no improvement on these measures.

Results for continuous variables were summarized with means, standard deviations, and ranges, and results for cat-

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egorical variables were summarized with counts and percentages. Student *t* test was used to evaluate increase in LOS, and the McNemar test for paired data was used to analyze rehabilitation gains from readiness-for-discharge day to the next postoperative day (POD). SAS Version 9.2 software (SAS Institute) was used for all analyses.

Results

Of the 284 patients included in the study, 203 were female (71.5%), 81 male (28.5%). Mean (SD) age was 68 (11) years (range, 21-92 years). One hundred seventy-nine patients (63.0%) underwent TKA, and 105 (37.0%) underwent THA. Two hundred twenty-seven patients (80.0%) were discharged to skilled nurs-

ing care, and 57 (20.1%) to inpatient rehabilitation. Mean (SD) LOS was 3.44 (0.92) days (range, 3-9 days). One hundred eighty-three patients (64.4%) were ready for discharge on POD 2, 76 (26.8%) on POD 3, and 25 (8.8%) after POD 3. Delaying discharge until POD 3 increased LOS by 1.08 days ($P < .001$). Two hundred nine patients (73.6%) were discharged on POD 3, and 75 (26.4%) after POD 3. Reasons for being discharged after POD 3 were lack of ECF bed availability (48 patients, 64.0%) and postoperative complications (27 patients, 36.0%). Patients ready for discharge on POD 2 had fewer complications than patients ready after POD 2 ($P < .001$).

Analysis of the 183 patients who were ready for discharge on POD 2 demonstrated a statistically significant ($P = .038$) change in rehabilitation progress by staying an additional hospital day. However, this difference was not clinically significant: Only 17.5% of patients improved, while 82.5% remained unchanged or declined in progress. Most important, among patients who demonstrated rehabilitation gains, the improvement was not sufficient to change the decision regarding discharge destination. Three patients (1.6%) ready for discharge on POD 2 were readmitted within 30 days of discharge (2 for wound infection, 1 for syncope). Risk for 30-day readmission or development of an inpatient complication in patients ready for discharge on POD 2 was not significant ($P = .073$). **Table 1** summarizes the statistical results.

As age 65 years or older is one of the major criteria for Medicare eligibility, a secondary analysis was performed to explore whether there were age-related differences in the study outcomes. We found no significant differences between patients 65 years or older and patients younger than 65 years with respect to discharge readiness, LOS, postoperative complications, or 30-day readmission. **Table 2** summarizes the statistical results based on age.

Table 1. Demographics of Study Group

	Ready for Discharge		P
	Before POD 3	POD 3 or After	
n	183	101	—
Mean (SD) age, y	68 (10)	67 (12)	.291
Sex, n (%)			.825
Male	53 (65.4%)	28 (34.6%)	
Female	130 (64.0%)	73 (36.0%)	
Surgery type, n (%)			.670
Total hip arthroplasty	66 (62.9%)	39 (37.1%)	
Total knee arthroplasty	117 (65.4%)	62 (34.6%)	
Mean (SD) length of stay, d	3.21 (0.5)	3.85 (1.3)	<.001
Reason length of stay >3 days, n (%)			<.001
Bed availability	30 (93.8%)	18 (41.9%)	
Complications	2 (6.2%)	25 (58.1%)	
30-day readmission, n (%)	3 (1.6%)	6 (5.9%)	.073

Abbreviation: POD, postoperative day.

Table 2. Results of Secondary Analysis Based on Age

	Age, y		P
	≥65	<65	
n	95	189	—
Ready for discharge, n (%)			.268
Before POD 3	57 (60.0%)	126 (66.7%)	
POD 3 or after	38 (40.0%)	63 (33.3%)	
Mean (SD) length of stay, d	3.48 (0.9)	3.42 (0.9)	.570
Reason length of stay >3 days, n (%)			.828
Bed availability	19 (65.5%)	29 (63.0%)	
Complications	10 (34.5%)	17 (37.0%)	
30-day readmission, n (%)	2 (2.1%)	7 (3.7%)	.722

Abbreviation: POD, postoperative day.

Discussion

Consistent with our pilot study,⁴ the majority of patients discharged to an ECF were ready for discharge on POD 2. Delaying discharge until POD 3 increased LOS by 1.08 days with no significant risk in 30-day readmission if patients were allowed to be discharged 1 day earlier. Different from our pilot study results, however, 17.5% of patients who stayed past their discharge readiness showed improvement in PT/OT progress, though this was not clinically sufficient to alter the decision regarding discharge destination. This difference can be attributed to the fact that the current study (vs the pilot study) was adequately powered for this outcome.

Our study was specifically designed to evaluate the effect of Medicare's 3-day rule—the requirement of an inpatient hospital stay of at least 3 consecutive days to qualify for coverage for treatment at an ECF. This policy creates tremendous unnecessary hospitalization and resource utilization and denies patients earlier access to specialized postacute care. To put the economic implications of this policy in perspective, almost half of the 1 million TJAs performed annually are performed for Medicare beneficiaries, and almost half of those patients are discharged to an ECF.^{1,2,5} This equates to about 161,000 days of unnecessary hospitalization per year (64.4% of 250,000 patients), which translates into \$310,730,000 in expenditures based on an average cost of \$1930 per inpatient day for state/local government, nonprofit, and for-profit hospitals.⁶ Furthermore, with a growing trend toward outpatient TJA, the Medicare statute may leave substantial bills for patients who happen to require unplanned discharge to an ECF.

This study had its weaknesses. First, it was a retrospective review of charts at a single tertiary-care hospital. However, observer bias may have been eliminated, as the data were collected before a study was planned. An outcome such as discharge readiness, if prospectively assessed, could easily have been influenced by study personnel. Second, our patient sample was too small to definitively resolve this issue and be able to effect public policy change. However, there was sufficient power for the primary outcome. We also analyzed a consecutive group of patients who underwent a standardized postoperative clinical pathway with clear discharge-readiness criteria.

The effect of this study in the era of the Patient Protection and Affordable Care Act and its Bundled Payments for Care Improvement (BPCI) initiative deserves special attention. The BPCI initiative is divided into 4 models that reconcile payments associated with an episode of care (eg, TKA) against a predetermined payment amount.⁷ Relevant to our study, BPCI model 2 covers inpatient hospitalization up to 30, 60, or 90 days after discharge and includes a waiver of the 3-day rule for inpatient hospitalization. There are only 60 BPCI model 2-participating health care organizations. On the basis of our study results, we think the waiver is a step in the right direction, as no demonstrable benefits were realized from having patients stay hospitalized longer. However, the waiver should not be limited to select entities, and we hope that, with further research, the statutory requirement of 3-day inpatient hospitalization will be repealed.

Conclusion

Our study results call into question the validity of Medicare's 3-day rule, and we hope they stimulate further research to definitively resolve this question. The majority of our study patients destined for discharge to an ECF could have been safely discharged on POD 2. The implications of reducing LOS cannot be overstated. From a hospital perspective, reducing LOS eliminates unnecessary hospitalization and resource utilization. From a patient perspective, it allows earlier access to specialized care and eliminates billing confusion. From a payer perspective, it may reduce costs significantly.

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This paper will be judged for the Resident Writer's Award.