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Is Rapid Recovery Hip and Knee Replacements Possible and Safe in the Octogenarian Patient?

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ABSTRACT

Background: Rapid recovery programs are now aimed to reduce costs of hip and knee arthroplasties by discharging patients directly home, shortening hospital length of stay (LOS), and reducing readmission rates. Although patients aged 80 years and older are included in the Medicare bundle, little work has been performed to determine if older patients can safely participate in rapid recovery programs.
Methods: We retrospectively reviewed 2482 patients undergoing primary and revision total hip and knee arthroplasties (THA and TKA) who all participated in a multifaceted rapid recovery program. The goals of this program were next day discharge to home without the use of home services or post-acute care admission. We examined the hospital LOS and the percentage of patients discharged home as well as 90-day readmission rates to determine efficacy and safety of this program in the patients aged 80 years and older.
Results: Octogenarians receiving primary THA and TKA were discharged home >90% of the time with LOSs <2 days and low readmission rates. Revision THA and TKA patients aged 80 years and older were discharged home about 70% of the time with significantly longer LOSs than patients aged more than 80 years. The revision THA patients aged more than 80 years had the highest readmission rates.
Conclusion: Patients aged more than 80 years can successfully and safely participate in rapid recovery programs.

The Bundled Payments for Care Improvement (BPCI) initiative seeks to align surgeons and hospitals by placing them at risk for financial penalty if adequate outcomes are not achieved or gain sharing opportunity if these goals are reached. Successful participation in the BPCI depends on minimizing adverse events with hip and knee arthroplasties while simultaneously minimizing the associated costs. Increased hospital length of stay (LOS), discharge to post-acute care facility (PACF), and hospital readmission are some of the primary drivers of cost during the episode of care [1–3]. Because PACF admission may also lead to increased readmission rates, minimizing PACF admission may lead to improved care and less costs [4].

Age is a major risk factor for postoperative complications, discharge to a PACF, and hospital readmission [5,6]. The increased incidence of comorbidity in the elderly has also been implicated in greater mortality, longer LOS, and increased complication rate after both primary and revision total joint arthroplasties (TJAs) [7–11]. However, improved pain and functional status after TJA) is still demonstrated in older patients [12–16]. Several studies have shown that a clinical pathway (CP) consisting of preoperative patient education, patient medical optimization, and improved inpatient care can reduce hospital LOS, minimize discharge to PACF, and improve readmission in the general arthroplasty population [17–21]. We have recently reported that our CP eliminated the longer LOS associated with surgery later in the week, but was unable to mitigate adverse outcomes associated with total hip arthroplasty (THA) in patients with high American Society of Anesthesiologists (ASA) scores [22,23]. Our CP includes discharge to home the day after surgery. Discharge to PACF is discouraged. Hip replacement patients perform a self-directed therapy program,

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Table 1
Demographics.

	YG	YG (N)	OG	OG (N)	*P* Value
Mean age (SD)					
All patients	61.6 (10.8)		83.5 (3.18)		
Mean ASA score (SD)					
All patients	2.44 (0.56)		2.62 (0.54)		.00073
pTHA	2.41 (0.59)	829	2.60 (0.56)	60	.09
rTHA	2.42 (0.55)	324	2.69 (0.62)	26	.046
pTKA	2.45 (0.55)	895	2.62 (0.49)	42	.15
rTKA	2.50 (0.56)	272	2.59 (0.50)	34	.77

ASA, American Society of Anesthesiologists; OG, older group; pTHA, primary total hip arthroplasty; pTKA, primary total knee arthroplasty; rTHA, revision total hip arthroplasty; rTKA, revision total knee arthroplasty; SD, standard deviation; YG, younger group.

whereas knee replacement patients go to outpatient physical therapy (PT). Home health PT services are not used.

The purpose of this study is to determine if patients aged 80 years and older undergoing primary or revision hip and knee replacement can safely participate in a rapid recovery CP. We hypothesize that octogenarian patients undergoing primary and revision hip or knee arthroplasty would have similar hospital LOS, discharge to PACF, and readmission rates when compared with patients aged less than 80 years.

Methods

We performed a retrospective study and identified 2482 patients who underwent primary and revision hip and knee replacements performed at a single institution from January 2013 to April 2015. One hundred sixty-two of these patients were aged more than 80 years (Table 1). The patients' age at surgery, ASA score, LOS, readmission within 90 days postoperative, and discharge disposition were recorded from the medical record. No patients in this study underwent primary THA for femoral neck fracture. During this period, we used a clinical care pathway for all TJA patients.

Details of the CP have been previously published [21,22].

Preoperatively, patient factors are maximized for a smooth recovery. This includes body mass index, smoking, opioid use, and other modifiable risk factors for surgery. The surgeon explains the goals of early discharge and the benefits to the patient of going directly home without home health care or rehabilitation service. The discussion must include the family who will provide that care. The increased risks of using additional services and rehabilitation or nursing facilities are clearly spelled out [4,24].

Preoperatively, all patients must attend the Joint Academy Education Program. The education program focuses on the expectation of discharge home without home health care.

Periarticular blocks using liposomal bupivacaine injections are used for pain control after primary total hip and knee arthroplasties. Intravenous (IV) narcotic medications are not administered in the postanesthesia care unit, and IV patient-controlled anesthetic devices are not used. Foley catheters are not placed to allow for early mobilization. Tranexamic acid (1 g IV at incision followed by 2nd dose 1 g IV dose 2 h later) is used to limit the need for blood transfusions. Thromboprophylaxis is with 81 mg ASA PO daily for 6 weeks along with 23 h per day mobile compression devices for 10 days after surgery. Those patients at higher risk for thromboembolism are treated with additional prophylaxis.

Patients are mobilized on the day of surgery and expected to eat meals out of bed. PT sees the patients twice on postoperative day (POD)#1 and discharge occurs if goals are met on the second PT visit. THA patients do not receive outpatient or home health PT.

Table 2
Difference in ALOS in Younger and Older Patients.

Procedure	Group	ALOS	*P* Value
Primary THA			.04
	Younger	1.18	
	Older	1.58	
Primary TKA			.7
	Younger	1.24	
	Older	1.95	
Revision THA			.02
	Younger	1.58	
	Older	3.03	
Revision TKA			.08
	Younger	1.42	
	Older	2.44	

ALOS, average length of stay; THA, total hip arthroplasty; TKA, total knee arthroplasty.

Home health care is a not ordered for patients. Total knee patients are prescribed outpatient PT after discharge to start the next day.

Postoperatively, patients are monitored by a TAVHealth coordinator with follow-up phone calls at a minimum of 24 h, 7-10, 30, 60, and 90 days after discharge (put in tav health reference). This management allows for reductions in emergency room visits and readmissions by preventing problems and attempting to have them addressed in the outpatient setting.

We divided patients into 2 groups, the younger group (YG) patients aged less than 80 years; and the older group (OG) equal to and older than 80 years. The average LOS, discharge to home rate, and readmission rate were calculated. Statistics for both groups were performed using Kaplan-Meier survivorship curves, log-rank, chi-square test, and Fisher exact test.

Results

In both primary total knee arthroplasty (TKA) and THA, mean LOS was <2 days. In primary arthroplasty, the LOS was significantly longer in the OG for hips ($P = .04$), but not knees ($P = .7$). Revision THA had longer LOS than in the primary groups ($P = .02$). In revision knee arthroplasty, the OG did not have longer LOS than the YG ($P = .08$; Table 2).

Over 90% of the OG primary TKA and THA patients were discharged directly home from the hospital. Both TKA and THA revision in the >80 group had significantly less patients discharge directly home ($P < .001$; Table 3).

In the primary THA cohort, readmission rate was significantly lower in the OG than the YG ($P = .03$). No difference between readmission rates was found between OG and YG in primary TKA or

Table 3
Difference by Age in Percentage of Patients Discharged Directly Home.

Procedure	Group	Percentage Home	*P* Value	Odds Ratio	Confidence Interval
Primary hip			<.001	18.3	5.4-61.9
	Younger	5/829 (99.4%)			
	Older	54/60 (90.0%)			
Primary knee			.0058	11.4	2.7-47.3
	Younger	6/895 (99.3%)			
	Older	3/42 (92.9%)			
Revision hip			<.001	14.6	4.8-44.4
	Younger	8/324 (97.5%)			
	Older	7/26 (73.1%)			
Revision knee			<.001	12.8	4.9-33.4
	Younger	10/272 (96.3%)			
	Older	11/34 (67.6%)			