Operating Room Turnover Time: An Area of Improvement for Hip Fractures

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INTRODUCTION:

Non-elective total hip arthroplasty (THA) to treat hip fractures has become a large economic burden for hospitals, insurers, and providers. Total costs and resources for treating hip fractures are rising while reimbursement is diminishing. Typically, the operating room (OR) accounts for up to 40% of a hospital's costs with estimates of $15-$50/minute. It is possible that turnover time, the time between one patient exiting the OR and the next case starting, also accounts for a variable that can be improved upon. The purpose of this study is to compare the turnover time and reimbursement between patients undergoing non-elective THA for hip fractures to patients undergoing elective THA for osteoarthritis.

METHODS:

The retrospective study identified all patients who underwent primary THA between 2015 to 2023. Only patients undergoing THA at a single hospital were included to limit variation of surgical teams. Patients were categorized into cohorts of non-elective and elective cases based on indication for THA. The primary outcome of the study was the OR turnover time. Secondary outcomes were operative cut-to-close times and surgeon reimbursement.

RESULTS:

683 patients were included in the study, with 74 (10.8%) patients in the non-elective cohort and 609 (89.2%) in the elective cohort. Turnover time was significantly longer in the non-elective cases (34.1 vs 29.3 minutes, p=0.015). Operating room cut-to-close time was similar between the two groups, with non-elective cases averaging a few additional minutes than elective cases (75.4 vs 72.1 minutes, p=0.514). Despite greater resource utilization and longer OR times, surgeon reimbursement was lower for non-elective than elective THA ($2050 vs. 2760, p=0.027).

DISCUSSION AND CONCLUSION:

In the present study, OR turnover times between cases remain an area of improvement, particularly for non-elective cases. Efficiency in turning over the OR can be a cost-containment strategy with goals of increasing reimbursement for more complex cases.

Table 1. Patient Demographics Comparing Elective and Non-Elective THA

	Total Cohort	Elective THA	Non-Elective THA	P-value
Number of Patients (N)	683	609	74	
Age	70.4 ± 10.1	70.3 ± 10.3	71.6 ± 8.44	0.400
Sex				0.414
Female	399 (58.4%)	352 (57.8%)	47 (63.5%)	
Male	284 (41.6%)	257 (42.2%)	27 (36.5%)	
Race				0.610
White	530 (86.2%)	478 (86.4%)	52 (83.9%)	
Black	35 (5.69%)	30 (5.42%)	5 (8.06%)	
Other	50 (8.13%)	45 (8.14%)	5 (8.06%)	
BMI (kg/m²)	29.4 ± 6.2	29.9 ± 6.04	25.7 ± 6.00	<0.001
ASA	2.58 ± 0.61	2.59 ± 0.58	2.49 ± 0.76	0.234
CCI Age Adjusted	4.11 ± 1.54	4.08 ± 1.52	4.38 ± 1.71	0.307

Values given as mean ± SD, N (%), median [1st quartile – 3rd quartile]; **Bold** values indicate statistical significance (p<0.05); *THA*, total hip arthroplasty; *BMI*, body mass index; *ASA*, American Society of Anesthesiologists physical status classification; *CCI*, Charlson Comorbidity Index prediction of 10-year survival.

Table 2. Elective vs. Non-Elective THA Outcomes

	Total Cohort	Elective THA	Non-Elective THA	P-value
Number of Patients (N)	683	609	74	
In OR to Cut Time	33.9 ± 8.80	33.4 ± 8.89	38.1 ± 8.64	**<0.001**
Cut-to-Close Time	72.5 ± 17.6	72.1 ± 16.8	75.4 ± 24.5	0.514
Turnover Time	29.8 ± 9.36	29.3 ± 8.78	34.1 ± 13.3	**0.015**
Readmissions	22 (3.22%)	15 (2.46%)	7 (9.46%)	**0.006**
Length of Stay	1.58 Days	1.22 Days	4.47 Days	**<0.001**
Surgical Reimbursement ($)	2,525 ± 1,754	2,760 ± 1,770	2,050 ± 1,561	**0.027**

Values given as mean ± SD, N (%); **Bold** values indicate statistical significance (p<0.05); *THA*, Total Hip Arthroplasty

Table 3. Patient Demographics Based on Insurance Status

	Total Cohort	Commercial	Medicare	Medicare Advantage	P-value
Number of Patients (N)	683	318	281	84	
Age	70.4 ± 10.1	65.4 ± 10.4	74.7 ± 7.24	75.5 ± 7.91	**<0.001**
Sex					0.541
Female	399 (58.4%)	179 (56.3%)	168 (59.8%)	52 (61.9%)	
Male	284 (41.6%)	139 (43.7%)	113 (40.2%)	32 (38.1%)	
Race					0.761
White	530 (86.2%)	254 (85.8%)	220 (85.9%)	56 (88.9%)	
Black	35 (5.69%)	20 (6.76%)	12 (4.69%)	3 (4.76%)	
Other	50 (8.13%)	22 (7.43%)	24 (9.38%)	4 (6.35%)	
BMI (kg/m²)	29.4 ± 6.23	30.2 ± 6.56	29.0 ± 5.95	28.0 ± 5.52	**0.004**
ASA	2.58 ± 0.61	2.49 ± 0.65	2.68 ± 0.54	2.61 ± 0.58	**<0.001**
CCI Age Adjusted	4.11 ± 1.54	3.55 ± 1.51	4.58 ± 1.34	4.68 ± 1.59	**<0.001**

Values given as mean ± SD, N (%); **Bold** values indicate statistical significance (p<0.05); *THA*, Total Hip Arthroplasty; *BMI*, body mass index; *ASA*, American Society of Anesthesiologists physical status classification; *CCI*, Charlson Comorbidity Index prediction of 10-year survival.

Table 4. Surgical Outcomes based on Insurance Status

	Total Cohort	Commercial Insurance	Medicare	Medicare Advantage	P-value
Number of Patients (N)	683	318	281	84	
Elective Surgery	609 (89.2%)	276 (86.8%)	259 (92.2%)	74 (88.1%)	0.101
In OR to Cut	33.9 ± 8.80	34.8 ± 8.15	33.3 ± 9.46	32.6 ± 8.67	**0.004**
Cut to Close	72.5 ± 17.8	76.1 ± 20.6	69.5 ± 13.8	68.8 ± 15.5	**<0.001**
Turnover Time	29.8 ± 9.36	28.6 ± 8.53	30.6 ± 8.67	31.3 ± 13.7	0.329
Readmissions	22 (3.22%)	11 (3.46%)	5 (1.78%)	6 (7.14%)	0.051
Length of Stay	1.58 days	1.67 days	1.54 days	1.31 days	0.544
Surgical Reimbursement ($)	2525 ± 1754	5121 ± 1474	1605 ± 416	1611 ± 124	**<0.001**

Values given as mean ± SD, N (%); **Bold** values indicate statistical significance (p<0.05); *THA*, Total Hip Arthroplasty