Planned and Actual Discharge Status Following Elective Total Knee Arthroplasty

Jeffrey K Lange, Michael Paskewicz, Paul Oh, Ethan F Eickmann, Jamie Elizabeth Collins, Angela T Chen, Jeffrey N Katz, ANTONIA F CHEN, Elena Losina

INTRODUCTION:

Since total knee arthroplasty (TKA) was removed from the CMS Inpatient-Only list in 2018, the proportion of TKA patients being admitted to the hospital postoperatively has continued to decrease. Optimizing bed planning is central in a resource-strained healthcare environment, to ensure that beds are available for those who need them most. The accuracy of planned discharge designation compared to actual time of discharge for primary TKA has not been studied in detail.

METHODS: We identified all elective TKAs performed in 2019, 2022, and 2023 at a large tertiary health care system (2020-2021 excluded due to the COVID pandemic). We stratified all elective TKAs into 3 groups based on planned admission status: 1) Planned Same Calendar Day Discharge (SCDD), 2) Planned Observation (overnight stay less than 2 midnights), and 3) Planned Inpatient (at least 2 midnights). The actual admission status was determined by calculating the difference between the date of admission and date of discharge. Through review of the medical records, hospital billing information, and an electronic data warehouse, we abstracted patient age, sex, race, ethnicity, primary language, ASA class, surgical duration, anesthesia time, time in the post-anesthesia care unit (PACU) and total time from admission to discharge. If primary language was not English, this was denoted as English as a second language (ESL). For Planned SCDD and Observation surgeries, admission status was deemed to be "extended" if a subject stayed in the hospital longer than anticipated. For Planned Observation and Inpatient surgeries, admission status was deemed to be "shortened" if a subject stayed in the hospital shorter than anticipated. We used Chi-squared (categorical variables) and ANOVA (continuous variables) to compare patient characteristics and episode of care parameters across actual discharge status.

RESULTS: Of the 10139 elective TKAs identified, 1884 (18%) were Planned SCDD, 4034 (40%) were Planned Observation, and 4421 (42%) were Planned Inpatient. 83% of the SCDD TKA recipients were discharged in the same calendar day, 14% spent one night at the hospital and 3% were admitted for at least two midnights. Among Planned Observation TKAs, 9% were SCDD, 64% spent one night at the hospital, and 27% were admitted for at least two midnights. Among Planned Inpatient TKAs, 4% were SCDD, 43% spent one midnight, and 52% stayed in the hospital for at least two midnights. Across all subjects in this TKA cohort, as compared with planned discharge, 13% of subjects experienced extended admission status, 24% experienced shortened admission status, and 63% had consistent planned and actual discharge status. Table 1 presents characteristics of subjects by actual discharge status. Non-white, Hispanic, female, and ESL TKA patients were more likely to be admitted for at least two midnights. Those with SCDD spent substantially less time in the operating room and PACU with total time spent at the hospital averaging 9.5 hours compared to 29 hours for those who spent one night at the hospital and 72.5 hours for TKA patients admitted for at least two midnights (p<0.001). Patients with SCDD were more likely to be prescribed benzodiazepines compared to those admitted for at least two midnights (64% vs 52%, p<0.001). SCDD subjects spent 176 minutes in PACU as compared to 316 and 300 minutes for subjects admitted < 2 midnights and 2+ midnights, respectively (P<0.001).

DISCUSSION AND CONCLUSION: The planned and actual admission status following TKA surgery differed substantially in our study cohort. The reasons underlying this discrepancy are likely multifactorial. When planned admission status differed from actual admission status, admission status was most often shortened as opposed to extended. Optimizing planned discharge status prior to TKA will likely lead to better bed distribution and resource allocation.

Table 1. Patient characteristics and episode of care parameters by discharge status

	Time from admission to discharge			P-value
	Same Day	One Midnight	Two Midnights	
ASA class	2.3 (0.5)	2.5 (0.5)	2.6 (0.5)	<.0001
Age	65.8 (8.4)	68.8 (8.8)	70.4 (9.2)	<.0001
Nonwhite race	9	11	16	<.0001
Hispanic	3	4	6	<.0001
Female	50	58	70	<.0001
ESL	2	5	7	<.0001
Time in OR (min)	133 (27)	143 (33)	151 (36)	<.0001
Duration of anesthesia (min)	121 (26)	130 (28)	139 (35)	<.0001
Time in PACU (min)	176 (119)	316 (424)	300 (488)	<.0001
Total time (hours)	9.5 (1.8)	29.2 (3.1)	72.5 (34.0)	<.0001
Taking opioids	74	69	74	<.0001
Taking benzodiazepines	64	55	52	<.0001

ASA = American Society of Anesthesiologists, ESL = English as a Second Language, PACU = post-anesthesia care unit, min = minutes. Race, ethnicity, sex, and medication management are reported as percentages. ASA class, age, time in OR, duration of anesthesia, time in PACU, and total time are reported as mean (standard deviation).