Factors Affecting Operating Room Scheduling Accuracy for Primary and Revision Total Knee Arthroplasty: A Retrospective Study

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abstract

Background: Optimizing operating room (OR) scheduling accuracy is important for improving OR efficiency and maximizing value of total knee arthroplasty (TKA). However, data on factors that may impact TKA OR scheduling accuracy are limited. **Materials and Methods:** A retrospective review of 7655 knee arthroplasties (6999 primary TKAs and 656 revision TKAs) performed between January 2020 and May 2023 was conducted. Patient baseline characteristics, surgeon experience (years in practice), as well as actual vs scheduled OR times were collected. Actual OR times that were at least 15% shorter or longer than scheduled OR times were considered to be clinically important. Logistic regression analyses were employed to assess the influence of specific patient and surgeon factors on OR scheduling inaccuracies. **Results:** Using adjusted odds ratio, patients with primary TKA who had a lower body mass index (P<.001) were independently associated with overestimation of scheduled surgical time. Conversely, younger age (P<.001), afternoon procedure start time (P<.001), surgeons with less than 10 years of experience (P=.037), and higher patient body mass index (P<.001) were associated with underestimation of scheduled surgical time. For revision TKA, female sex (P=.021) and morning procedure start time (P=.038) were associated with overestimation of scheduled surgical time, while surgeons with less than 10 years of experience (P=.014) and patients who underwent spinal/epidural/block anesthesia (P=.038) were associated with underestimation of scheduled surgical time. **Conclusion:** This study highlights patient, surgeon, and intraoperative variables that impact the accuracy of scheduling for TKA procedures. Health systems should take these variables into consideration when creating OR schedules to fully optimize resources and available space. [*Orthopedics*. 202x;4x(x):xx-xx.]

In US hospitals, operating rooms (ORs) account for approximately 70% of revenues, highlighting the importance of appropriate resource allocation and staff management within these departments.[1] The effectiveness of OR management depends in part on the critical element of optimizing OR scheduling, which directly influences patient care, resource use, and value. The financial repercussions of inaccurate OR scheduling primarily stem from

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unplanned overtime and the necessity for increased staffing.[1-3] Optimization of OR scheduling can facilitate improved personnel planning leading to cost savings. Additionally, inaccurate OR scheduling can lead to longer wait times and heighten patients' anxiety and discomfort prior to their surgery.[4-6] Lack of OR efficiency creates more stress on the surgeon and team, adds time to already long workdays, and can contribute to burnout.[7,8]

Numerous approaches have been used to improve OR scheduling accuracy. Certain medical facilities use scheduling software alongside input from surgeons, whereas others have found success in implementing machine learning models to substantially improve accuracy.[1,2,9] However, advanced technologies may be costly and difficult to implement. Moreover, published studies focused on non-orthopedic specialties and the data used to facilitate OR scheduling varied from hospital to hospital, which limits its reproducibility. As a result, the specific factors governing OR scheduling accuracy for orthopedic procedures, such as total knee arthroplasty (TKA), remain inadequately characterized and warrant further investigation.

Published literature has highlighted the influence of patient characteristics and surgeon experience on surgical time.[10-12] Patient demographics can impact the complexity and duration of surgical procedures, and understanding their role in OR scheduling is essential for tailored resource allocation and improved patient outcomes. For example, Abbas et al[13] demonstrated that there is a direct, linear relationship between body mass index (BMI) and duration of surgery. Lau et al[14] found an association between less experienced surgeons and longer TKA procedural time. However, no published studies have evaluated the impact of patient characteristics and surgeon experience on TKA OR scheduling accuracy.

The purpose of this study was to investigate the impact of patient demographics, surgeon experience, and other surgical factors on OR scheduling accuracy for primary TKA and revision TKA (rTKA). By analyzing these variables, we aim to uncover the factors that contribute to imprecise OR scheduling. Identifying patient and surgeon-related factors that are associated with scheduling errors will enable surgeons and hospital administrators to better predict scheduling variability. These insights will allow hospitals and other health care facilities to make better-informed scheduling decisions to optimize resource use and thus value.

Materials and Methods

Study Design

This was an institutional review board–approved study conducted as part of a quality improvement initiative. A retrospective review was conducted at an urban academic institution of 7655 knee arthroplasty cases—6999 primary TKAs and 656 rTKAs—between January 2020 and May 2023. Patients were excluded if they were younger than 18 years, underwent bilateral or non-elective TKA, or had an indication for surgery other than primary osteoarthritis. OR time was measured from wheels in to wheels out (WIWO), which includes anesthesia induction (including peripheral blocks), patient positioning, draping, the surgical procedure, and post-procedure imaging when performed. Actual and scheduled OR times were documented and compared for each procedure. Actual operative times that were shorter or longer than 15% of the scheduled operative times were deemed to have clinically significant inaccurate OR scheduling. The 15% cutoff is used as part of an internal tool by OR coordinators at our institution who seek to minimize such deviations. Using these parameters, patients were categorized into three cohorts: accurate scheduled TKA, shorter than scheduled TKA, and longer than scheduled TKA. Subsequently, patient characteristics, surgeon experience, anesthesia type, use of robotic assistance (RA), and procedure start time were compared between these cohorts.

Data Collection/Outcome Measures

Patient baseline characteristics, such as sex, age, race, smoking status, insurance status, American Society of Anesthesiologists (ASA) score, BMI, and Charlson Comorbidity Index (CCI), were collected from the institutional electronic medical record (Epic Systems).[15] Surgeon experience was assessed based on the number of years in practice. Surgeons were categorized into two groups: those with 10 years or less of experience and those with greater than 10 years of experience. The division at the 10-year mark was chosen due to its well-documented association with the highest variability in operative time.[16] Primary TKA was also classified into RA and non-RA (manual and computer-navigated) groups. Anesthesia type used in the procedure was categorized into the following two groups: those who received regional (spinal/epidural/block) anesthesia and those who received general (including general anesthesia plus peripheral block) anesthesia. As for the procedure start time, it was stratified into two distinct groups: those commencing prior to 12:00 pm (morning) and those commencing after 12:00 pm (afternoon).

TKA OR scheduling time-slots are typically allocated by an Epic Systems algorithm-predicted time based on the median of previous TKA procedures per surgeon, and referred to the predicted WIWO time frame. Surgeons are allowed to manually adjust predicted OR case time at their discretion. The actual surgical duration was calculated as the time between the patient's entry to (wheels in) and departure from (wheels out) the OR.

Statistical Analysis

Data analyses were performed using SPSS, version 25, software (IBM). Demographic characteristics, surgeon experience, and other surgical factors were presented as means with ranges for continuous variables or as frequencies and percentages for categorical variables. The differences in outcome parameters between the groups were analyzed using a chi-square test, as appropriate.

Logistic regression models were then employed to determine specific patient, surgeon, and surgical factors that contributed to OR scheduling inaccuracies. Regression analyses were performed to compare the following: (1) accurate vs shorter than scheduled TKA or rTKA and (2) accurate vs longer than scheduled TKA or rTKA. Scheduling accuracy served as the dependent variable for the multivariate regression analyses. Several independent variables were included in the regression models, namely, sex, age, BMI, CCI, surgeon experience, use of RA (only TKA), anesthesia type, and procedure start time. The results were reported as adjusted odds ratio with 95% CI to quantify the relationships between OR scheduling inaccuracies and the independent variables. $P<.05$ was considered statistically significant.

Table 1

Baseline Characteristics for TKA Operations

Characteristic	Accurate scheduled TKA (n=5194)	Shorter than scheduled TKA (n=709)	Longer than scheduled TKA (n=1096)	*P*
Sex, No. (%)				<.001
Male	1705 (32.8)	154 (21.7)	461 (42.1)	
Female	3489 (67.2)	555 (78.3)	635 (57.9)	
Age, mean (range), y	67.6 (24-94)	68.0 (31-90)	65.1 (24-88)	<.001
Race, No. (%)				<.001
Asian	264 (5.1)	56 (7.9)	39 (3.6)	
Black	948 (18.3)	88 (12.4)	272 (24.8)	
White	3007 (57.9)	436 (61.5)	605 (55.2)	
Not reported	975 (18.8)	129 (18.2)	180 (16.4)	
Smoking status, No. (%)				.102
Current	222 (4.3)	20 (2.8)	59 (5.4)	
Former	1712 (33.0)	248 (35.0)	353 (32.2)	
Never	3222 (62.0)	436 (61.5)	681 (62.1)	
Unknown	38 (0.7)	5 (0.7)	3 (0.3)	
Insurance status, No. (%)				.003
Medicare	2944 (56.7)	404 (57.0)	552 (50.4)	
Medicaid	410 (7.9)	61 (8.6)	104 (9.5)	
Commercial	1840 (35.4)	244 (34.4)	440 (40.1)	
ASA score, No. (%)				<.001
1	119 (2.3)	12 (1.7)	33 (3.0)	
2	2957 (57.0)	453 (63.9)	551 (50.3)	
3	2059 (39.6)	239 (33.7)	496 (45.3)	
4	59 (1.1)	5 (0.7)	16 (1.4)	
BMI, mean (range), kg/m^2	32.3 (15.3-70.7)	30.4 (18.0-61.1)	34.5 (18.8-72.8)	<.001
CCI, mean (range)	3.4 (0-17)	3.4 (0-14)	3.1 (0-16)	<.001
Surgeon experience, No. (%)				.040
0-10 y	728 (14.0)	112 (15.8)	184 (16.8)	
>10 y	4466 (86.0)	597 (84.2)	912 (83.2)	

Abbreviations: ASA, American Society of Anesthesiologists; BMI, body mass index; CCI, Charlson Comorbidity Index; TKA, total knee arthroplasty.

Results

Primary TKA

In total, 7655 cases were included in the analysis: 6999 primary TKAs and 656 rTKAs. Demographic factors showed significant discrepancies between patients in the accurate, shorter than, and longer than scheduled TKA cohorts. Patients with accurate or shorter OR times had an older mean age than patients with longer OR times (67.6 [accurate] vs 68.0 [shorter] vs 65.1 [longer] years, $P<.001$). Compared with patients in the accurate cohort, patients with shorter OR times were significantly less likely to be men and those with longer OR times were significantly more likely to be men (32.8% vs 21.7% vs 42.1%, $P<.001$). Additionally, compared with patients with accurate OR times, patients with shorter OR times had significantly lower mean BMI and patients with longer OR times had significantly higher mean BMI (32.3 vs 30.4 vs 34.5 kg/m^2, $P<.001$). Patients of non-White race were significantly more likely to have longer than scheduled OR times ($P<.001$). Patients with higher ASA score were significantly more likely to have longer than scheduled OR times ($P<.001$). Interestingly, higher CCI was associated with accurate or shorter OR times ($P<.001$). Smoking status was not significantly correlated with scheduling inaccuracies ($P=.102$). Compared with accurate cases, both shorter and longer than scheduled cases were more likely to have a surgeon with 10 years or less of experience (14.0% vs 15.8% vs 16.8%, $P=.040$) (**Table 1**).

Table 2

Baseline Characteristics for rTKA Operations

Characteristic	Accurate scheduled rTKA (n=288)	Shorter than scheduled rTKA (n=143)	Longer than scheduled rTKA (n=225)	*P*
Sex, No. (%)				.025
Male	108 (37.5)	38 (26.6)	90 (40.0)	
Female	180 (62.5)	105 (73.4)	135 (60.0)	
Age, mean (range), y	65.8 (33-91)	65.6 (45-86)	66.5 (34-97)	.670
Race, No. (%)				.500
Asian	3 (1.0)	3 (2.1)	2 (0.9)	
Black	80 (27.8)	33 (23.1)	73 (32.4)	
White	142 (49.3)	78 (54.5)	104 (46.2)	
Not reported	63 (21.9)	29 (20.3)	46 (20.4)	
Smoking status, No. (%)				.884
Current	19 (6.6)	8 (5.6)	14 (6.2)	
Former	106 (36.8)	49 (34.3)	72 (32.0)	
Never	160 (55.6)	85 (59.4)	138 (61.3)	
Unknown	3 (1.0)	1 (0.7)	1 (0.4)	
Insurance status, No. (%)				.719
Medicare	165 (57.3)	79 (55.2)	136 (60.4)	
Medicaid	15 (5.2)	11 (7.7)	14 (6.2)	
Commercial	108 (37.5)	53 (37.1)	75 (33.4)	
ASA score, No. (%)				.782
1	3 (1.0)	3 (2.1)	4 (1.8)	
2	152 (52.8)	74 (51.7)	107 (47.6)	
3	129 (44.8)	62 (43.4)	109 (48.4)	
4	4 (1.4)	4 (2.8)	5 (2.2)	
BMI, mean (range), kg/m^2	32.8 (20.0-51.2)	31.7 (16.7-53.3)	33.7 (17.1-58.6)	.017
CCI, mean (range)	3.4 (0-14)	3.1 (0-15)	3.4 (0-16)	.480
Surgeon experience, No. (%)				.068
0-10 y	46 (16.0)	26 (18.2)	54 (24.0)	
>10 y	242 (84.0)	117 (81.8)	171 (76.0)	

Abbreviations: ASA, American Society of Anesthesiologists; BMI, body mass index; CCI, Charlson Comorbidity Index; rTKA, revision total knee arthroplasty.

In a multivariate regression analysis that compared accurate with shorter than scheduled TKA, based on adjusted odds ratio, men (0.530; 95% CI, 0.439-0.641; *P*<.001), afternoon procedure start times (0.768; 95% CI, 0.647-0.913; *P*=.003), and patients with a higher BMI (0.941; 95% CI, 0.927-0.955; *P*<.001) were significantly less likely to have OR time shorter than scheduled (**Table A**, available in the online version of the article).

A separate multivariate regression analysis was conducted to investigate the differences between accurate and longer than scheduled TKA. Based on adjusted odds ratio, men (1.590; 95% CI, 1.385-1.826; *P*<.001), younger patients (0.985; 95% CI, 0.976-0.993; *P*<.001), afternoon procedure start times (1.552; 95% CI, 1.356-1.775; *P*<.001), use of RA (1.753; 95% CI, 1.490-2.061; *P*<.001), and patients with a higher BMI (1.056; 95% CI, 1.045-1.068; *P*<.001) were more likely to have longer than scheduled OR time. Additionally, surgeons with 10 years or less of experience were more likely to have underestimated scheduled time compared with surgeons with greater than 10 years of experience (0.824; 95% CI, 0.687-0.988; *P*=.037) (**Table B**, available in the online version of the article).

Revision TKA

Demographic differences were also noted among patients in the rTKA cohorts, categorized as accurate, shorter than, and longer than scheduled. Men had a significantly lower likelihood of experiencing shorter than scheduled OR times but a significantly higher likelihood of experiencing longer than scheduled OR times (37.5% [accurate] vs 26.6% [shorter] vs 40.0% [longer], *P*=.025). Additionally, patients with shorter OR times had a notably lower mean BMI, whereas patients with longer OR times had a significantly higher mean BMI (32.8 vs 31.7 vs 33.7 kg/m^2, *P*=.017). Although not achieving statistical significance, patients with accurate or shorter OR times had a younger mean age compared with patients with longer OR times (65.8 vs 65.6 vs 66.5 years, *P*=.670). There were no significant differences in race (*P*=.500), smoking status (*P*=.884), insurance status (*P*=.719), ASA score (*P*=.782), CCI (*P*=.480), or surgeon experience (*P*=.068) between the rTKA cohorts (**Table 2**).

In a multivariate regression analysis comparing accurate with shorter than scheduled rTKA, women (0.589; 95% CI, 0.376-0.922; *P*=.021) and morning start times (0.620; 95% CI, 0.395-0.974; P=.038) were significantly more likely to have OR times shorter than scheduled. Age, BMI, CCI, surgeon experience, and procedure start time were not strong indicators of shorter than scheduled rTKA (**Table C**, available in the online version of the article).

A separate multivariate regression analysis was conducted to investigate differences between accurate and longer than scheduled rTKA. Surgeons with 10 years or less of experience were more likely to have underestimated scheduled time compared with surgeons with greater than 10 years of experience (0.569; 95% CI, 0.364-0.891; P=.014). Patients who underwent general anesthesia were less likely to have OR times longer than scheduled (0.111; 95% CI, 0.014-0.884; P=.038). Sex, age, BMI, CCI, and procedure start time were not strong predictors of longer than scheduled rTKA (**Table D**, available in the online version of the article).

Discussion

This study sought to identify factors influencing OR scheduling inaccuracy for primary TKA and rTKA to enhance OR efficiency and optimize resource allocation within health care systems. Our findings shed light on several patient characteristics, surgeon experience, and other surgical factors as key determinants of OR scheduling inaccuracies, providing insights that can be used to improve efficiency and health care value.

Our study identified several patient characteristics that predict OR time over- and underestimation by scheduling software. The multivariate logistic regression analyses found that patient sex was a strong predictor of scheduling accuracy, with female patients being more likely to have a shorter than scheduled surgical time and male patients being more likely to have a longer than scheduled surgical time. Because the current study did not use radiographic measurements, it is unclear if this difference was due to the anatomical differences between women and men. Motesharei et al,[17] in a recent study that used machine learning algorithms, found sex to be a relatively weak predictor of TKA operative time compared with weight and several radiographic measurements. Thus, the significance of sex as a predictor of scheduling accuracy is likely to derive from underlying anatomical differences.

Although not as significant as sex, patient BMI, race, and age were also found to be significantly associated with scheduling inaccuracies. Patients with a higher BMI were less likely to have a surgery that was shorter than scheduled and were more likely to have a surgery that was longer than scheduled. A direct relationship between BMI and operative time in TKA has been widely established.[18-20] Our results indicate that scheduling algorithms do not account for BMI when calculating operative times. Interestingly, patients of Black race were significantly more likely to require longer than scheduled OR times. Kaidi et al[21] found that race may influence case order in total hip arthroplasty but did not influence case order in TKA. They did not analyze surgical time. This finding warrants further study as it may influence equitable access to care. Patient age did not affect the likelihood of operative time being overestimated, but younger patients were slightly more likely to have longer than scheduled OR times. This could be due to physiological differences in health status. Potential contributors may include differing levels of comorbidities, tissue resilience, or surgical complexity. After a logistic regression analysis was performed, CCI was not found to be a predictor of scheduling accuracy, indicating that comorbidities do not cause significant, unpredictable deviations in operative time.

Anesthesia type, regional or general, was not a predictor of scheduling inaccuracy for primary cases. Chandler et al[22] found that general anesthesia reduced the time to prepare the patient preoperatively, while regional anesthesia reduced the time to remove the patient from the OR postoperatively. These effects canceled each other out, resulting in no major differences in operative time and likely accounting for similar rates of scheduling inaccuracy for primary TKA found in the current study.

Time of day was found to be a strong predictor of scheduling inaccuracy. TKAs performed in the morning were more likely to be overestimated and TKAs performed in the afternoon were more likely to be underestimated. These results coincide with those of Hammoor et al,[23] who found that compared with the first cases of the day, mid-day cases were on average 4.9 minutes longer and late cases were on average 7.3 minutes longer. Because the current study's methods controlled for many patient and operative factors that affect surgery time, it is likely the scheduling inaccuracy reported derived from surgeon fatigue. Because surgeon fatigue and increased operative times are correlated with greater risk of postoperative complications, including prosthetic joint infection, measures should be taken to manage surgeon fatigue throughout the surgical day.[24] Surgeon fatigue is a multifaceted issue. Employing the noon cutoff served as a stand-in for assessing surgeon fatigue, yet it might also be influenced by factors such as case volume and case complexity.

The current study also revealed that surgeon experience significantly influenced OR scheduling accuracy. Surgeons with 10 years or less of experience were more likely to have their surgical time underestimated compared with surgeons with greater experience. Previous research on surgical experience and learning curve in surgical procedures has yielded varied results. Weber et al[25] found that trainees performed conventional TKA faster than experienced surgeons. However, they found no differences in operative time between trainees and experienced surgeons when computer-assisted navigation was used for TKA. Woolson and Kang[26] described prolonged operative times in TKA performed at teaching service centers compared with private institutions. Khanuja et al[16] did not discover any statistically significant differences in mean operative time based on surgeon volume and experience in TKA procedures. However, there was a clinically significant difference of approximately 30 minutes in TKA surgical time between surgeons with 10 years or less of experience compared with those with greater than 10 years of experience. The factors of surgeon experience that contribute to the unpredictability of OR scheduling accuracy are not fully understood. One possible explanation is that less experienced surgeons have limited historical data that can be used to predict operative times. Regardless, these results highlight the importance of factoring surgeon experience into OR scheduling to avoid potential delays and enhance resource use.

Optimizing OR scheduling accuracy can improve value for health care systems. The financial implications of inaccurate OR scheduling are profound, with unplanned overtime and need for increased staffing contributing to higher costs. Recent estimates of OR costs range from $30 to more than $100 per minute.[27] By accurately estimating surgical time, hospitals can better allocate staff, reduce unplanned overtime, and optimize resource use. Inaccurate scheduling can also result in longer wait times for patients, leading to increased anxiety and discomfort prior to surgery.[4-6] Given increased awareness of surgeon burnout, it is even more important to minimize inefficiencies that can derail work-life balance.[28] Although methods such as scheduling software and machine learning models have shown promise in aiding OR scheduling, their implementation in orthopedics remains limited. Thus, our research contributes to existing literature by focusing on factors that impact accurate OR scheduling specifically for orthopedic procedures, serving as a basis for tailored strategies. Our study's findings suggest that optimizing OR schedules based on patient demographics and surgeon experience can enhance cost-effectiveness and improve patient experience.

Certain limitations should be acknowledged in the course of this research. First, the retrospective design may introduce inherent biases and limit the scope of data collection. Future studies should seek to incorporate radiographic measurements and a measure of surgical complexity. Second, the use of WIWO time includes variability in time for induction, positioning, draping, and obtaining postoperative imaging. However, we did find that patients with accurate and shorter than scheduled times were more likely to have ASA scores of 1 or 2, whereas patients with longer times had worse ASA scores. Future studies could break down these times to understand how they contribute to scheduling inaccuracy. The 15% threshold for clinically significant longer or shorter OR times, based off WIWO time, may also pose challenges for faster surgeons. They have less leeway to deviate from the scheduled time without having their surgeries considered significantly longer or shorter. Third, in our academic health system, a large number of residents and fellows assist with TKA procedures. We did not analyze variation in OR time based on type, number, or training level of surgical assistants. Presence of surgical trainees with less or more experience may impact scheduling accuracy and surgical time.[29] Additionally, our investigation was conducted at a single urban academic health center, which may not fully represent the practices of all institutions. Prospective, multicenter studies with larger samples are needed to strengthen the evidence base and enhance the generalizability of the findings.

Conclusion

This study highlights the impact of patient sex, age, BMI, anesthesia type, procedure start time, and surgeon experience on OR scheduling accuracy for primary TKA and rTKA. Current scheduling software does not account for many of these factors. Inclusion of patient and surgical factors in scheduling algorithms may help optimize resources, reduce costs, and improve patient experience. More accurate scheduling can also potentially improve work-life balance for surgeons. Tailoring OR schedules based on patient demographics and surgeon experience may lead to more precise TKA and rTKA scheduling, ultimately enhancing the overall OR efficiency and value of care.

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Table A. All Dependent Variables Entering the Logistic Regression Mode and Their Adjusted Odds Ratio (Accurate vs. Shorter than Scheduled TKA)

	Adjusted OR (CI)	**P value**
Sex (M)	0.530 (0.439 to 0.641)	**<.001**
Age	0.998 (0.988 to 1.008)	.724
BMI	0.941 (0.927 to 0.955)	**<.001**
CCI	0.987 (0.949 to 1.027)	.514
Experience (>10 yrs)	0.857 (0.687 to 1.070)	.173
Technology (Robotic)	1.224 (0.996 to 1.503)	.054
Anesthesia Type (General)	0.999 (0.618 to 1.615)	.997
Procedure Start Time (After 12 pm)	0.768 (0.647 to 0.913)	**.003**

BMI, Body mass index; CCI, Charlson Comorbidity Index

Table B. All Dependent Variables Entering the Logistic Regression Mode and Their Adjusted Odds Ratio (Accurate vs. Longer than Scheduled TKA)

	Adjusted OR (CI)	**P value**
Sex (M)	1.590 (1.385 to 1.826)	**<.001**
Age	0.985 (0.976 to 0.993)	**<.001**
BMI	1.056 (1.045 to 1.068)	**<.001**
CCI	0.985 (0.953 to 1.019)	.385
Experience (>10 yrs)	0.824 (0.687 to 0.988)	**.037**
Technology (Robotic)	1.753 (1.490 to 2.061)	**<.001**
Anesthesia Type (General)	0.663 (0.410 to 1.072)	.094
Procedure Start Time (After 12 pm)	1.552 (1.356 to 1.775)	**<.001**

BMI, Body mass index; CCI, Charlson Comorbidity Index

Table C. All Dependent Variables Entering the Logistic Regression Mode and Their Adjusted Odds Ratio (Accurate vs. Shorter than Scheduled rTKA)

	Adjusted OR (CI)	**P value**
Sex (M)	0.589 (0.376 to 0.922)	**.021**
Age	1.001 (0.976 to 1.027)	.933
BMI	0.971 (0.939 to 1.004)	.085
CCI	0.941 (0.847 to 1.046)	.262
Experience (>10 yrs)	0.827 (0.481 to 1.422)	.492
Anesthesia Type (General)	0.523 (0.136 to 2.018)	.347
Procedure Start Time (After 12 pm)	0.620 (0.395 to 0.974)	**.038**

BMI, Body mass index; CCI, Charlson Comorbidity Index

Table D. All Dependent Variables Entering the Logistic Regression Mode and Their Adjusted Odds Ratio (Accurate vs. Longer than Scheduled rTKA)

	Adjusted OR (CI)	P value
Sex (M)	1.192 (0.825 to 1.720)	.350
Age	1.018 (0.997 to 1.041)	.097
BMI	1.026 (0.998 to 1.055)	.065
CCI	0.966 (0.887 to 1.052)	.427
Experience (>10 yrs)	0.569 (0.364 to 0.891)	**.014**
Anesthesia Type (General)	0.111 (0.014 to 0.884)	**.038**
Procedure Start Time (After 12 pm)	0.997 (0.657 to 1.511)	.988

BMI, Body mass index; CCI, Charlson Comorbidity Index