

# Oral Postoperative Antibiotic Prophylaxis Patterns for Outpatient Total Hip and Knee Arthroplasty

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**INTRODUCTION:**  
Despite a drastic increase in outpatient total hip and knee arthroplasties (THA, TKA), large scale data are lacking on outpatient care practice patterns, especially regarding antibiotic prophylaxis for infection prevention. Using national data, we aimed to describe current antibiotic prophylaxis prescribing patterns for outpatient TKA and THA.

## METHODS:

This nationwide retrospective cohort study included primary outpatient THA or TKA procedures in patients aged 18-64 between February 1, 2018-November 30, 2021 using a large healthcare database. We identified oral antibiotic prescriptions filled in the perioperative period, defined as 5 days before surgery to 3 days after surgery; these were categorized and assumed to represent postoperative prophylaxis. Antibiotic therapeutic class, generic name, dosing pattern, and number of pills dispensed were extracted. A multivariable logistic regression model measured the association between the odds of filling an antibiotic prophylaxis prescription with patient demographics, comorbidities, geographic region, surgery setting, and surgery year. Adjusted odds ratios (OR) and 95% confidence intervals (CI) are reported.

## RESULTS:

Patients filled an oral antibiotic prophylaxis prescription in 16% of 88,742 outpatient THA/TKA (18.2% of 30,898 THA cases, 15.1% of 57,844 TKA cases) procedures. A cephalosporin was prescribed in 75% of these cases, with cephalexin (53.41%) and cefadroxil (19.18%) being the most commonly prescribed. The most common non-cephalosporin antibiotics prescribed were clindamycin (7.2%), doxycycline (5.86%), and sulfamethoxazole/trimethoprim (5.83%). The median cephalexin 500 mg prescription was a 2-day supply compared to a 7-day course for cefadroxil 500 mg, doxycycline 100 mg, and sulfamethoxazole/trimethoprim 800 mg-160 mg and a 3-day course for Clindamycin 300 mg. The odds of filling a prophylactic antibiotics prescription were increased for THA versus TKA patients (OR 1.12, 95% CI 1.08-1.17, P < 0.001), those receiving surgery in an ambulatory surgery center compared to hospital-based outpatient (OR 2.58, 95% CI 2.48-2.68, P < 0.001), and those undergoing surgery in 2020 and 2021 versus 2018 (OR 1.17-1.40, P < 0.001). Compared to the South region, patients living in the Northeast region and West regions had decreased odds of receiving antibiotics (OR 0.91, 95% CI 0.85-0.97, P = 0.01; OR 0.61, 95% CI 0.58-0.65, P < 0.001), and those in the North Central region had increased odds (OR 1.26, 95% CI 1.21-1.32, P < 0.001). Additionally, those aged 55-64 had decreased odds of filling an antibiotic compared to those aged 18-34 (OR 0.76, 95% CI 0.62-0.93, P = 0.01).

## DISCUSSION AND CONCLUSION:

In the outpatient setting, oral antibiotic prophylaxis prescriptions were filled in only 16% of THA/TKA cases, with substantial variation in the antibiotic type prescribed. Variation was additionally noted in the odds of receiving oral prophylactic antibiotics which were found to be higher in THA patients, ambulatory surgery centers, and surgeries in 2020/2021. Follow-up research will evaluate how antibiotic prophylaxis patterns have evolved as outpatient THA and TKA have increased as well as the efficacy of these antibiotic regimens in prosthetic joint infection prevention.

Table 1. Demographics of patients included in study.

	No. Prophylactic Antibiotics (N=14323) (%)	No. Prophylactic Antibiotics (N=7417) (%)	P-value	Standardized Difference
<b>Surgery Year</b>				
2018	7748 (52.2)	1000 (13.5)	<0.001	0.086
2019	2449 (17.1)	1342 (18.3)		
2020	4919 (39.2)	2323 (31.2)		
2021	5812 (41.5)	2452 (33.0)		
<b>Age Group</b>				
18-34	125 (0.9)	488 (6.7)	<0.001	0.076
35-44	539 (3.8)	2559 (34.4)		
45-54	3759 (27.0)	17180 (23.1)		
55-64	10862 (76.4)	34303 (46.3)		
<b>Sex</b>				
Female	7608 (53.1)	40028 (53.8)	0.11	0.014
Male	6715 (46.9)	34159 (46.2)		
<b>Arthroplasty Type</b>				
TKA	8721 (60.9)	49223 (66.3)	<0.001	0.107
THA	5602 (39.1)	25250 (33.7)		
<b>Surgical Setting</b>				
Hospital	7929 (55.4)	34501 (46.5)	<0.001	0.444
ASC	8394 (58.6)	17915 (24.1)		
<b>Region</b>				
Northeast	3218 (22.5)	7629 (10.3)	<0.001	0.243
North Central	3028 (21.2)	20083 (27.1)		
South	6073 (42.4)	34904 (47.1)		
West	1482 (10.3)	12319 (16.6)		
<b>Smoking</b>				
No	13559 (95.4)	71700 (96.3)	<0.001	0.059
Yes	775 (5.4)	2777 (3.7)		
<b>Charlson-Deyo Comorbidity Index</b>				
0	13777 (96.2)	64506 (86.4)	<0.001	0.095
1	1297 (9.1)	8524 (11.5)		
2+	251 (1.8)	1587 (2.1)		

Table 2. Binary logistic regression & odds ratios.

	OR	95% Confidence Limits	P-Value
<b>Surgery Year</b>			
2019	1.00	0.84, 1.07	0.96
2020	1.17	1.10, 1.24	<0.0001
2021	1.40	1.32, 1.48	<0.0001
<b>Age Group</b>			
18-34	-	-	-
35-44	0.81	0.65, 1.01	0.06
45-54	0.82	0.68, 1.02	0.08
55-64	0.76	0.62, 0.93	0.01
<b>Sex</b>			
Female	-	-	-
Male	0.99	0.85, 1.07	0.53
<b>Arthroplasty Type</b>			
TKA	-	-	-
THA	1.12	1.08, 1.17	<0.0001
<b>Surgical Setting</b>			
Hospital	-	-	-
ASC	2.58	2.48, 2.68	<0.0001
<b>Region</b>			
South	-	-	-
Northeast	0.91	0.85, 0.97	0.01
North Central	1.26	1.21, 1.32	<0.0001
West	0.61	0.58, 0.65	<0.0001
<b>Smoking</b>			
Yes	-	-	-
No	0.90	0.81, 1.01	0.07
<b>Charlson-Deyo Comorbidity Index</b>			
1	1.05	0.89, 1.12	0.12
2+	1.09	0.95, 1.23	0.21

Table 3. Antibiotics prescribed.

Therapeutic Class	N	%	Generic Name	N	%
<b>Cephalosporin &amp; Beta-lactam</b>	10757	75.09	Cefadroxil	2104	19.18
			Cefazolin	96	0.87
			Cefuroxime Axetil	277	1.97
			Cephalexin	7011	51.04
<b>Miscellaneous Antibiotics</b>	1032	7.28	Clindamycin Hydrochloride	1032	7.28
			Tetracycline	839	5.86
			Doxycycline	439	3.14
<b>Sulfamethoxazole &amp; Combination</b>	835	5.83	Sulfamethoxazole/Trimethoprim	835	5.83
<b>Penicillin</b>	590	3.94	Ampicillin	340	2.37
			Amoxicillin/Clavulanic Acid	202	1.41
			Penicillin V Potassium	11	0.08
<b>Quinolone</b>	318	2.25	Ciprofloxacin Hydrochloride	318	2.25
			Levofloxacin	197	1.39
<b>Erythromycin &amp; Macrolide</b>	137	0.96	Erythromycin	137	0.96

Table 4. Timing of antibiotic prophylaxis.

Timing	N	%
Filled Rx 1-5 Days Before Surgery	4349	30.36
Filled Rx 1-3 Days After Surgery	2861	19.97
Filled Rx Day of Surgery	7384	51.55
Filled Rx Pre - Day of Post Surgery	216	1.51