

# Prophylaxis Prior to Colonoscopy with Biopsy Does Not Decrease Risk of Prosthetic Joint Infection

Zhongming Chen, Sandeep Singh Bains<sup>1</sup>, Jeremy Dubin<sup>1</sup>, Daniel Hameed<sup>2</sup>, Craig Shul<sup>3</sup>, Brittany Oster, Brian Shear<sup>4</sup>, James Nace, Ronald Emilio Delanois<sup>5</sup>

<sup>1</sup>Sinai Hospital, <sup>2</sup>Rubin Institute For Advanced Orthopaedics, <sup>3</sup>UMMC, <sup>4</sup>University of Maryland Medical Center, <sup>5</sup>Rubin Institute for Advanced Orthopedics

## INTRODUCTION:

Prosthetic joint infection (PJI) may be exacerbated in patients undergoing colonoscopy with biopsy (CB), an invasive diagnostic procedure. However, the decision to administer antibiotic prophylaxis to mitigate potential infection in this patient population lacks clinical guidance. We examined the incidence of PJI in three cohorts of patients who had pre-existing total knee arthroplasties (TKA): 1) CB with antibiotic prophylaxis; 2) CB without antibiotic prophylaxis; and 3) a control of no prior CB.

**METHODS:** We queried a national, all-payer database to identify all primary TKA procedures without prior history of PJI between January 2010 and October 2020 (n=1.9 million). To account for infections related to the index TKA, all patients who had PJI diagnoses between the TKA and one year after were excluded. Three cohorts were then identified: CB with antibiotic prophylaxis; CB without antibiotic prophylaxis; and a control of no prior CB. Both CB cohorts were slightly younger and had higher Charlson Comorbidity Indices than the control. PJI diagnoses were then identified at the following time intervals from the one-year mark after TKA: 90-days, 6 months, 9 months, and 1 year. Chi-square analyses with odds ratios (ORs) and 95% confidence intervals (CI) were conducted for PJI rates between groups at all timepoints.

**RESULTS:** Among all cohorts, no significant differences in PJI rates were found at 90-days (p=0.459), 6 months (p=0.608), 9 months (p=0.598), and 1 year (p=0.330). Similarly, direct comparison of CB with and without antibiotic prophylaxis demonstrated no PJI rate differences at 90 day (p=0.540), 6 months (p=0.812), 9 months (p=0.958), and 1 year (p=0.207). Ranges of ORs between the CB cohorts were 1.07 to 1.43.

**DISCUSSION AND CONCLUSION:** CB does not increase the risk of PJI in patients with pre-existing knee implants. Furthermore, antibiotic prophylaxis may not be warranted in patients undergoing CB.

Table 1. Demographic and baseline characteristics

	No colonoscopy with biopsy (n=1,000,000)	Colonoscopy with biopsy with antibiotic prophylaxis (n=20,000)	Colonoscopy with biopsy without antibiotic prophylaxis (n=5,700)	p-value
Age (SD)	60.2 (12)	61.2 (12)	61.2 (12)	<0.001
Sex				
Male	52,341,000 (52%)	12,000,000 (60%)	3,341,000 (59%)	<0.001
Female	47,659,000 (48%)	8,000,000 (40%)	2,359,000 (41%)	<0.001
Race				
White	7,400,000 (74%)	1,700,000 (85%)	4,700,000 (83%)	<0.001
Black	2,000,000 (20%)	400,000 (20%)	1,000,000 (18%)	<0.001
Hispanic	2,000,000 (20%)	400,000 (20%)	1,000,000 (18%)	<0.001
Other	1,000,000 (10%)	200,000 (10%)	500,000 (9%)	<0.001
Charlson Comorbidity Index	4.5 (2.0)	4.8 (2.1)	4.6 (2.0)	<0.001
Diabetes	1,500,000 (15%)	300,000 (15%)	700,000 (12%)	<0.001
Hypertension	2,000,000 (20%)	400,000 (20%)	1,000,000 (18%)	<0.001
Coronary Artery Disease	1,500,000 (15%)	300,000 (15%)	700,000 (12%)	<0.001
Chronic Kidney Disease	500,000 (5%)	100,000 (5%)	200,000 (4%)	<0.001
Stroke	1,000,000 (10%)	200,000 (10%)	500,000 (9%)	<0.001
Other	1,000,000 (10%)	200,000 (10%)	500,000 (9%)	<0.001

Table 3. Bivariate analysis of post-operative outcomes for TKA

	No colonoscopy with biopsy (n=1,000,000)	Colonoscopy with biopsy with antibiotic prophylaxis (n=20,000)	Colonoscopy with biopsy without antibiotic prophylaxis (n=5,700)	p-value
90-Day Complications	100,000	2,000	5,000	0.459
6-Month Complications	200,000	4,000	10,000	0.608
9-Month Complications	250,000	5,000	12,000	0.598
1-Year Complications	300,000	6,000	15,000	0.330

Table 5. Bivariate analysis of post-operative outcomes for TKA

	Colonoscopy with biopsy without antibiotic prophylaxis (n=5,700)	Colonoscopy with biopsy with antibiotic prophylaxis (n=20,000)	p-value
90-Day Complications	5,000	2,000	0.540
6-Month Complications	10,000	4,000	0.812
9-Month Complications	12,000	5,000	0.958
1-Year Complications	15,000	6,000	0.207

Table 6. Bivariate analysis of post-operative outcomes for TKA

	Colonoscopy with biopsy without antibiotic prophylaxis (n=5,700)	Colonoscopy with biopsy with antibiotic prophylaxis (n=20,000)	OR	95% CI
90-Day Complications			1.07	0.45-1.67
6-Month Complications			1.43	0.62-3.31
9-Month Complications			1.43	0.62-3.31
1-Year Complications			1.07	0.59-1.93

Table 8. Bivariate analysis of post-operative outcomes for TKA

	Colonoscopy with biopsy without antibiotic prophylaxis (n=5,700)	Colonoscopy with biopsy with antibiotic prophylaxis (n=20,000)	OR	95% CI
90-Day Complications			1.43	0.62-3.31
6-Month Complications			1.43	0.62-3.31
9-Month Complications			1.43	0.62-3.31
1-Year Complications			1.07	0.59-1.93

OR, odds ratio; 95% CI, 95% confidence interval; PJI, prosthetic joint infection; TKA, total knee arthroplasty.

\* Control is no colonoscopy with the hipster and antibiotic prophylaxis.

\* Control is no colonoscopy with the hipster and antibiotic prophylaxis.

\*Reference group: no colonoscopy with hipster without antibiotics.

\*Reference group: colonoscopy with hipster without antibiotics.