

# Mental Health Disease Associated with Increased Risk of Infection Following Total Knee Arthroplasty

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**INTRODUCTION:**  
Total knee arthroplasty (TKA) has some of the highest postoperative satisfaction rates; however, the process of undergoing a joint replacement can be mentally taxing. Anxiety and depression have been extensively studied, but there is paucity of literature regarding mental health and postoperative infections. The objective of this study is to determine if there is a relationship between anxiety, depression, and postoperative infection following TKA.

## METHODS:

A prospectively collected institutional database from a multicenter healthcare system was queried with ICD-10 codes and manually reviewed for patients undergoing primary TKA between March and December 2020. Univariate and multivariate analyses were performed comparing patients with anxiety alone, depression alone, and both anxiety and depression to those without mental health disease. Periprosthetic joint infections (PJIs) were defined based on MSIS criteria, and superficial surgical site infections (SSIs) were defined as infections that did not meet MSIS criteria.

## RESULTS:

Of the 2,511 patients, 296 were diagnosed with anxiety (11.8%), 257 with depression (10.2%), and 141 with both anxiety and depression (5.6%). Patients with anxiety were 3.5x more likely to develop an infection overall (p=0.01), and 3.7x more likely to develop a PJI (p=0.05). Those with depression were 3.2x more likely to develop an infection (p=0.02), and those with both anxiety and depression were 4.6x more likely to develop an infection (p=0.02), and 5.7x more likely to develop a PJI (p=0.03). Also, those with both anxiety and depression were 2.3x more likely to be readmitted (p=0.05).

## DISCUSSION AND CONCLUSION:

Our study shows that mental health plays a role in the development of infection after TKA. Patients with mental health disease need greater motivation to get out of bed and follow postoperative protocols. Thus, we recommend that surgeons reinforce the importance of postoperative rehabilitation, and that PT/OT should be aware of these patients, so they can allot more time to spend with them.

Table 1. Univariate analysis of demographics and comorbidities

	Infection (n = 19)	No Infection (n = 2,492)	p-value
Age (years)	63.0 ± 7.2	66.8 ± 9.0	0.07
BMI (kg/m <sup>2</sup> )	31.8 ± 6.3	32.2 ± 6.4	0.78
Sex			0.06
Male	11 (58%)	924 (37.1%)	
Female	8 (42%)	1,568 (62.9%)	
Obesity	6 (31.5%)	808 (32.4%)	0.94
Anemia	6 (31.5%)	332 (13.2%)	0.02
Renal Failure	1 (5.3%)	183 (7.3%)	0.59
Malnutrition	1 (5.3%)	6 (0.2%)	0.05
Diabetes	2 (10.6%)	462 (18.5%)	0.29
MI	0 (0.0%)	23 (0.9%)	0.87
PVD	0 (0.0%)	28 (1.1%)	0.84
CVA	0 (0.0%)	32 (1.3%)	0.82
CKD	0 (0.0%)	20 (0.8%)	0.70
COPD	0 (0.0%)	57 (2.3%)	0.51
Peptic Ulcer Disease	0 (0.0%)	18 (0.7%)	0.71
Rheumatoid Arthritis	0 (0.0%)	56 (2.2%)	0.51
Smoking	8 (42.1)	787 (31.6%)	0.33
Anxiety	6 (31.6%)	293 (11.8%)	0.01
Depression	5 (26.3%)	252 (10.1%)	0.02
ESRD	0 (0.0%)	3 (0.1%)	0.88
Hypertension	12 (63.2%)	1,104 (44.3%)	0.10
Hyperlipidemia	10 (52.6%)	796 (31.9%)	0.05
Preoperative COVID	0 (0.0%)	29 (0.9%)	0.84
Postoperative COVID	0 (0.0%)	10 (0.3%)	0.78

Table 2. Univariate analysis of anxiety and depression

	ANXIETY YES (n = 296)	NO (n = 2,215)	OR	95% CI	p-value
Infection overall	6 (2.0%)	13 (0.6%)	3.48	[1.31, 9.18]	0.01
Superficial surgical site infection	4 (1.4%)	1 (0.05%)	1.85	[0.21, 16.63]	0.47
Periprosthetic joint infection	4 (1.4%)	8 (0.4%)	3.74	[1.12, 12.48]	0.05
Hospital readmission	10	40	1.86	[0.92, 3.75]	0.08
	DEPRESSION YES (n = 257)	NO (n = 2,254)	OR	95% CI	p-value
Infection overall	5 (1.9%)	14 (0.6%)	3.17	[1.13, 8.88]	0.02
Superficial surgical site infection	0 (0.0%)	5 (0.2%)	-	-	-
Periprosthetic joint infection	3 (1.2%)	9 (0.4%)	2.96	[0.78, 10.95]	0.12
Hospital readmission	9 (3.5%)	41 (1.8%)	1.92	[0.92, 4.01]	0.08
	ANXIETY AND DEPRESSION YES (n = 141)	NO (n = 2,370)	OR	95% CI	p-value
Infection overall	4 (2.8%)	15 (0.6%)	4.58	[1.5, 14]	0.02
Superficial surgical site infection	0 (0.0%)	5 (0.2%)	-	-	-
Periprosthetic joint infection	3 (2.1%)	9 (0.4%)	5.71	[1.53, 21.31]	0.03
Hospital readmission	6 (4.3%)	44 (1.9%)	2.32	[0.97, 5.55]	0.05

Table 3. Multivariate analysis for infection.

	OR	95% CI	p-value
Anxiety	4.94	[1.75, 13.95]	0.003