

# Short- and Long-Term Complications of Total Knee Arthroplasty and Total Hip Arthroplasty in Patients with History of Malignant Neoplasms of Bone: A Database Study

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**INTRODUCTION:** There is paucity of large cohort studies and long-term follow up regarding complications after total knee arthroplasty (TKA) or total hip arthroplasty (THA) in the setting of malignant tumors of bone. The aim of this investigation was to determine the incidence of postoperative joint and systemic complications up to five years following TKA and THA in patients with malignant bone neoplasms.

**METHODS:**

A retrospective cohort study was conducted using the TriNetX Analytics Network. A 1:1 propensity score matching function was utilized to match baseline characteristics. Odds ratios were used for comparison of inter-cohort outcomes, with a significance level of <0.05.

**RESULTS:** A total of 340,060 individuals underwent TKA/THA with or without malignancy. After propensity matching, there were no significant preoperative risk factors and cohorts were equal. Patients with bone malignancy with TKA were at higher risk for developing prosthetic joint infections (PJI), pulmonary embolism (PE), acute kidney injury (AKI), urinary tract infection (UTI), and deep vein thrombosis (DVT) after 1 year, and sepsis, heterotopic ossification (HO), and stroke by 5 years (table 1). There were no significant short-term differences in complications for TKA patients. Patients with bone malignancy with THA were at higher risk for developing PE and AKI by 1 month, and HO, UTI, pneumonia, and DVT by 1 year, and stroke by 5 years (table 2).

**DISCUSSION AND CONCLUSION:**

Risk of complications in patients with bone malignancy undergoing TKA or THA are low in the short-term but increase over time. This information is critical in counseling and when considering prosthetic surveillance protocols.

Table 1. Short and Long term systemic and joint complications in patients undergoing total knee arthroplasty with and without metastatic bone or articular neoplasm.

Outcome	Neoplasm (N)	No Neoplasm (N)	OR (95% CI)	P value
<b>Stroke</b>				
1 month	10*	10*		
1 year	10*	10*		
5 years	27	11	2.534 (1.244 – 5.165)	0.008
<b>Myocardial Infarction</b>				
1 month	10*	0		
1 year	10*	10*		
5 years	20	12	1.693 (0.819 – 3.501)	0.151
<b>Pulmonary Embolism</b>				
1 month	18	10*	1.829 (0.836 – 4.001)	0.125
1 year	29	11	2.733 (1.350 – 5.532)	0.004
5 years	39	16	2.554 (1.409 – 4.632)	0.001
<b>Acute Kidney Injury</b>				
1 month	11	12	0.915 (0.400 – 2.093)	0.833
1 year	37	22	1.834 (1.008 – 2.983)	0.044
5 years	72	40	1.929 (1.283 – 2.899)	0.001
<b>Sepsis</b>				
1 month	10*	10*		
1 year	10*	10*		
5 years	23	10	2.360 (1.112 – 5.010)	0.021
<b>Pneumonia</b>				
1 month	10*	10*		
1 year	20	12	1.693 (0.819 – 3.501)	0.151
5 years	53	24	2.346 (1.425 – 3.862)	0.001
<b>Urinary Tract Infection</b>				
1 month	10*	10*		
1 year	44	19	2.438 (1.403 – 4.236)	0.001
5 years	79	47	1.803 (1.228 – 2.646)	0.002
<b>Deep vein thrombosis</b>				
1 month	12	10*	1.205 (0.516 – 2.814)	0.666
1 year	29	10*	3.012 (1.453 – 6.247)	0.002
5 years	48	16	3.204 (1.795 – 5.720)	<0.001
<b>Heterotrophic Ossification</b>				
1 month	0	0		
1 year	12	10*	1.205 (0.516 – 2.814)	0.666
5 years	27	10*	2.793 (1.338 – 5.832)	0.004
<b>Prosthetic joint infection</b>				
1 month	10*	10*		
1 year	41	10*	4.366 (2.163 – 8.813)	<0.001
5 years	56	13	4.708 (2.542 – 8.720)	<0.001

\*TriNetX reports non-zero values less than 10 as 10

Table 2. Short and Long term systemic and joint complications in patients undergoing total hip arthroplasty with and without metastatic bone or articular neoplasm.

Outcome	Neoplasm (N)	No Neoplasm (N)	OR (95% CI)	P value
<b>Stroke</b>				
1 month	10*	10*		
1 year	10*	10*		
5 years	20	21	0.950 (0.509 – 1.775)	0.873
<b>Myocardial Infarction</b>				
1 month	10*	10*		
1 year	10*	10*		
5 years	20	15	1.347 (0.682 – 2.660)	0.390
<b>Pulmonary Embolism</b>				
1 month	21	10*	2.146 (1.001 – 4.602)	0.045
1 year	31	10*	3.232 (1.568 – 6.663)	0.001
5 years	43	15	3.034 (1.663 – 5.532)	<0.001
<b>Acute Kidney Injury</b>				
1 month	25	10*	2.575 (1.324 – 5.417)	0.010
1 year	41	24	1.768 (1.052 – 2.972)	0.029
5 years	72	50	1.510 (1.029 – 2.215)	0.034
<b>Sepsis</b>				
1 month	0	10*		
1 year	10*	10*		
5 years	18	12	1.518 (0.724 – 3.182)	0.266
<b>Pneumonia</b>				
1 month	10*	10*		
1 year	30	14	2.212 (1.159 – 4.222)	0.014
5 years	66	29	2.460 (1.561 – 3.876)	0.126
<b>Urinary Tract Infection</b>				
1 month	16	10*	1.619 (0.728 – 3.601)	0.233
1 year	48	28	1.786 (1.102 – 2.895)	0.017
5 years	80	62	1.343 (0.940 – 1.917)	0.104
<b>Deep Vein Thrombosis</b>				
1 month	19	10	1.934 (0.890 – 4.200)	0.090
1 year	41	18	2.386 (1.352 – 4.211)	0.002
5 years	63	23	2.977 (1.816 – 4.878)	<0.001
<b>Heterotrophic Ossification</b>				
1 month	10*	10*		
1 year	23	10*	2.360 (1.112 – 5.008)	0.021
5 years	36	11	3.440 (1.732 – 6.835)	<0.001
<b>Prosthetic Joint Infection</b>				
1 month	10*	10*		
1 year	16	10*	1.619 (0.728 – 3.601)	0.233
5 years	23	13	1.805 (0.904 – 3.602)	0.090

\*TriNetX reports non-zero values less than 10 as 10