

# The Association of Osteoporosis with Early Complications in Cementless Total Knee Arthroplasty

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## INTRODUCTION:

Cemented total knee arthroplasty (TKA) has long been the gold standard for patients with end stage knee osteoarthritis. Historically, cementless TKA has been associated with early loosening and reserved for younger patients with good bone quality. However, recent literature has suggested favorable outcomes in the elderly population. The primary aim of this study was to determine if cementless TKA was associated with an increased risk of early complications in patients with and without a diagnosis osteoporosis. To our knowledge, this is the largest cohort of patients with osteoporosis in elderly TKA patients.

## METHODS:

A retrospective design utilizing a nationwide database across 28 states was performed analyzing patients who underwent cementless TKA between 2017 and 2019. Primary outcome measures were 30-day readmission, 30-day reoperation, and 30-day complication rates. Patients were stratified based on the diagnosis of osteoporosis into two groups; osteoporotic patients and non-osteoporotic patients. Secondary outcomes included hospital length of stay and hospitalization cost.

## RESULTS:

A total of 42,401 patients were included in the study, 2.8% of whom were identified as osteoporotic. There was no significant difference in reoperation rates (0.25% vs. 0.29%,  $p=0.94$ ) between osteoporotic and non-osteoporotic patients who underwent cementless TKA. Similarly, osteoporotic patients did not have higher rates of surgical (0.68% vs. 0.46%,  $p=0.38$ ), medical (1.4% vs. 1.4%,  $p=0.95$ ), or other (0.59% vs. 0.53%,  $p=0.91$ ) complications as compared to non-osteoporotic patients. Osteoporotic patients had significantly higher 30-day readmission rates (3.3% vs. 2.8%,  $p<0.01$ ) and longer lengths of hospital stay (2.6 days vs. 2.3 days,  $p<0.01$ ). No difference was observed in hospitalization costs between osteoporotic and non-osteoporotic patients (\$16,571 vs. \$16,562,  $p=0.97$ ).

## DISCUSSION AND CONCLUSION:

In our study, 1,177 osteoporotic patients who underwent cementless TKA were included. We report no significant difference in reoperation rates, surgical, or medical complications when compared to non-osteoporotic patients. Osteoporotic patients did have greater 30-day readmission rates and hospital length of stay with no difference in associated cost.

This study demonstrates that cementless TKA is not associated with early immediate revision surgery in patients with a prior diagnosis of osteoporosis.

DEMOGRAPHICS	Osteoporosis (N= 1177)	Non-osteoporosis (N=41224)	Significance
Age: (%)			$p<0.01$
• 18-44	0.3	1.6	
• 45-64	23.1	46.6	
• 65-74	42.3	36.4	
• >74	34.2	15.4	
Female (%)	89.8	54.4	$<0.01$
Weekend (%) (Admission day is on a weekend)	0.59	0.35	0.26
Payer (%)			$<0.01$
1. Medicare	74.1	50.4	
2. Medicaid	3.1	4.9	
3. Private	20.1	39.9	
4. Self-pay	0.4	0.4	
Median Household Income Quartile for Patient's ZIP Code (%)			0.70
1. 0-25 <sup>th</sup> percentile	22.1	22.1	
2. 26 <sup>th</sup> -50 <sup>th</sup> percentile	29.7	27.9	
3. 51 <sup>st</sup> -75 <sup>th</sup> percentile	26.5	27.8	
4. 76 <sup>th</sup> -100 <sup>th</sup> percentile	21.1	21.3	
Rural (%)	7.7	7.4	0.79
Inpatient Rehab Transfer (%)	1.5	1.2	0.42
Disposition (%)			$<0.01$
1. Routine	32.2	38.2	
2. Transfer to Short-term Hospital	0.2	0.2	
3. Transfer to other facility (incl. skilled nursing facilities)	20.7	13.7	
4. Home Health Care	46.8	47.8	
5. Against Medical Advice	0.1	0.1	
Length of Initial Hospital Stay (days)	2.6	2.3	$<0.01$
Cost of Initial Hospitalization (USD\$)	16571	16562	0.97
30 Day Readmission (%)	3.3	2.8	$<0.01$

Adverse Event (%)	Osteoporosis (N= 1177)	Non-osteoporosis (N=41224)	Significance
Reoperation within 30 days	0.25	0.29	$p=0.94$
Surgical Complications	0.68	0.46	0.38
Periprosthetic fracture	0.25	0.05	0.02
Dislocation	0.09	0.04	0.99
Wound healing disorder	0	0.01	0.33
Joint infection	0.34	0.36	0.89
Medical Complications	1.4	1.4	0.95
Acute coronary syndrome	0.09	0.07	0.69
Decompensated heart failure	0.51	0.35	0.51
Cardiac arrhythmia	0.93	0.75	0.61
Pneumonia	0.25	0.19	0.86
Acute renal failure	0.17	0.60	0.09
Other Complications	0.59	0.53	0.91
Thrombosis	0.17	0.27	0.69
Pulmonary embolism	0.34	0.22	0.60
Syncope/Collapse	0.09	0.07	0.69
Cerebrovascular accident	0	0.04	0.97