

# Should Chronological Age be a Consideration in Patients Undergoing Total Knee Arthroplasty?

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**INTRODUCTION:** The optimal time for total knee arthroplasty (TKA) requires a balance between patient disability and health state in order to minimize complications. While chronological age has not been shown predictive of complications in elective surgical patients, there is a point beyond which even optimized elderly patients would be at increased risk for complications. The purpose of this study is to examine the impact of chronological age on complications following primary TKA.

**METHODS:** Using an administrative database, the records of 2,129,191 patients undergoing elective unilateral TKA between 2006-2021 were reviewed. The primary outcomes of interest were cardiac and pulmonary complications and their relationship to Deyo Comorbidity Index (Deyo) and chronological age. Secondary outcomes included risk of renal, neurologic, infection, and intensive care utilization postoperatively. The results were analyzed using a graphical method. The impact of chronological age as a modifier of overall risk for complications was modeled as a continuous variable. An age cutoff threshold of 80 years was also assigned for clinical convenience.

**RESULTS:** The risk of complications correlated more closely to the Deyo index (OR 1.37-2.1) rather than chronological age (OR 1.0-1.1) across the various complications [Table-1]. However, beyond age 80 years, the risks of cardiac, pulmonary, renal, and cerebrovascular complications were significantly increased for all Deyo index categories (OR 1.73-3.40) compared to patients below age 80 years [Table-2] [Fig-1A and 1B].

## DISCUSSION AND CONCLUSION:

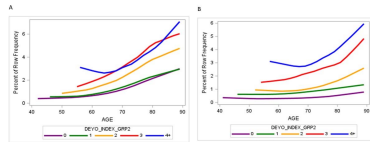
Chronologic age can impact the risk of complications even in well optimized elderly patients over age 80 undergoing primary TKA. As arthroplasty continues to transition to outpatient settings and inpatient denials increase, these results can help patients, physicians, and payors mitigate risk while optimizing allocation of resources.

Table 1. Odds Ratios of Complications against Age and Deyo index.

Complications	Age			Deyo		
	Odds Ratio	95% CI		Odds Ratio	95% CI	
Cardiac	1.057	1.055	1.058	1.326	1.311	1.342
Pulmonary	1.025	1.023	1.027	1.762	1.736	1.788
Acute MI	1.063	1.059	1.068	2.094	2.039	2.150
Acute Renal Injury	1.029	1.028	1.030	2.044	2.027	2.061
Infection	1.011	1.010	1.012	1.520	1.504	1.537
CNS	1.062	1.060	1.064	1.165	1.147	1.183
ICU admission	1.017	1.016	1.018	1.567	1.554	1.581

Table 2. Odds ratios of complications between patients >80 and <=80 years of age.

Complications	Age>80 vs Age<=80		
	Odds Ratio	95% CI	
Cardiac	2.670	2.591	2.750
Pulmonary	2.029	1.934	2.130
Acute MI	3.392	3.117	3.691
Acute Renal Injury	1.960	1.903	2.018
Infection	1.536	1.482	1.591
CNS	2.708	2.601	2.819
ICU admission	1.727	1.679	1.775



Figures 1A and 1B. Prevalence of cardiac (A) and pulmonary (B) complications by Deyo Comorbidity Index