

# Assessing Risk Factors for 90-Day Emergency Department Visits Status-Post Index Total Knee Arthroplasty: A Retrospective Case Control Study

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**INTRODUCTION:** With the increasing adoption of value-based healthcare initiatives in total knee arthroplasty (TKA), a greater emphasis has been placed on implementing cost-saving measures while maintaining or improving quality of care. One area of interest has been postoperative ED visits. Here we evaluate potential risk factors for 90-day ED visits.

## METHODS:

This is a case control study from a large, tertiary, private, academic institution. All primary TKAs between 7/1/2013 to 12/31/2017 were obtained retrospectively from a prospective institutional database utilized for contribution to a state-wide joint arthroplasty database. All patient charts were subsequently verified and reviewed for all-cause 90-day ED visits, and divided into two cohorts based on their ED visit. Patients were subsequently compared for differences in their baseline demographics, medical comorbidities, intra-operative factors and postoperative course. Unpaired t-test and chi-squared tests were performed for continuous and categorical variables, respectively, with  $p < .05$  as statistically significant.

## RESULTS:

8,554 total knee arthroplasties were included in the study period. 679 patients (7.94%) required an ED visit within 90 days while the remaining 7875 (92.06%) did not.

Preoperatively, TKAs requiring a 90-day ED visit were significantly younger ( $65.32 \pm 10.12$  vs  $66.52 \pm 9.62$ ;  $p < 0.01$ ), had higher ASA scores (ASA 3/4: 57.58% vs 43.98%;  $p < 0.0001$ ), more likely diabetic (21.98% vs 17.50%;  $p < 0.05$ ), and had positive history of DVT (14.58% vs 7.72%;  $p < 0.0001$ ). Surgically, these patients were significantly more likely to have received general anesthetic (43.89% vs 36.01%;  $p < 0.001$ ) and not receive intraoperative tranexamic acid (80.71% vs 84.86%;  $p < 0.01$ ). Post-operatively, these patients had a longer length of stay ( $2.75 \pm 1.69$  vs  $2.55 \pm 1.44$ ;  $p < 0.001$ ) and be reported to have a post-operative DVT (3.98% vs 1.27%;  $p < 0.0001$ ). Other patient demographics, MRSA colonization/decolonization, anesthetics, surgical approach, postoperative transfusion and discharge disposition were similar between groups.

**DISCUSSION AND CONCLUSION:** Patients undergoing primary total knee arthroplasty have a combination of modifiable and non-modifiable risk factors and surgical variables contributing to postoperative ED visits. Further research is warranted to identify areas of potential quality improvement.

Table 1: Demographics	No ED n=7875	ED 90 Days n=679	P-Value
Age	66.52±9.62	65.32±10.12	<.01
Gender			0.53
Female	5048 (64.10%)	444 (65.39%)	
Male	2827 (35.90%)	235 (34.61%)	
BMI (kg/m <sup>2</sup> )	31.76±6.45	32.08±6.84	0.21
Weight (kg)	90.14±20.92	90.66±21.65	0.54
ASA Score			<.0001
1	68 (0.86%)	0	
2	4340 (55.11%)	288 (42.42%)	
3	3359 (42.65%)	373 (54.93%)	
4	105 (1.33%)	18 (2.65%)	
Unknown	3 (0.04%)	0	
Diabetic			<.05
Yes	1378 (17.50%)	149 (21.98%)	
No	6493 (82.43%)	529 (78.02%)	
Unknown	6 (0.08%)	0	
Smoking			0.24
Current	545 (6.92%)	60 (8.84%)	
Former	4358 (55.34%)	369 (54.34%)	
Previous	2945 (37.40%)	249 (36.67%)	
Unknown	27 (0.34%)	1 (0.15%)	
Preoperative MRSA Colonization			0.43
Positive	1418 (18.44%)	130 (19.49%)	
Negative	6246 (81.22%)	533 (79.91%)	
Unknown	26 (0.34%)	4 (0.60%)	
Preoperative MRSA Decolonization			0.40
Yes	713 (9.07%)	71 (10.47%)	
No	6910 (87.89%)	584 (86.14%)	
Unknown	239 (3.04%)	23 (3.39%)	
History of DVT Preoperatively			<.0001
Yes	608 (7.72%)	99 (14.58%)	
No	7263 (92.23%)	580 (85.42%)	
Unknown	4 (0.05%)	0	
Anesthetics (Not mutually exclusive)			1.00
Block	2928 (37.18%)	253 (37.26%)	
Epidural	407 (5.17%)	28 (4.12%)	0.27
General	2836 (36.01%)	298 (43.89%)	<.001
Local	5726 (72.71%)	480 (70.69%)	0.28
Spinal	5191 (65.92%)	387 (57.0%)	<.0001
Intraoperative Tranexamic Acid			<.01
Yes	6683 (84.86%)	548 (80.71%)	
No	1192 (15.14%)	131 (19.29%)	

Table 1 Con't: Demographics	No ED n=7875	ED 90 Days n=679	P-Value
Approach			0.61
Sub-vastus	6 (0.08%)	0	
Mid-vastus	1606 (20.39%)	123 (18.11%)	
Medial Parapatellar	6230 (79.11%)	553 (81.44%)	
Lateral Parapatellar	5 (0.06%)	0	
Other/Unknown	28 (0.36%)	3 (0.44%)	
Surgical Time (Hours)	1.46±0.57	1.48±0.53	0.57
Length of stay	2.55±1.44	2.75±1.69	<.001
Received Transfusion	372 (4.72%)	41 (6.04%)	0.15
Discharge			0.27
Home with self-care	208 (2.64%)	17 (2.50%)	
Home with services	5523 (70.13%)	480 (70.69%)	
Subacute nursing facility	1657 (21.04%)	155 (22.83%)	
Inpatient Rehabilitation	479 (6.08%)	27 (3.98%)	
Short term hospital facility	5 (0.06%)	0	
Hospice	3 (0.04%)	0	
Postoperative DVT			<.0001
Yes	100 (1.27%)	27 (3.98%)	
No	7771 (98.73%)	652 (96.02%)	