Postoperative Communication Volume following Total Joint Arthroplasty Can be a Precursor to Emergency Department Visits

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INTRODUCTION:

Arthritis is an increasingly prevalent disease in the aging population with a growing demand for total joint arthroplasty (TJA) for advanced joint disease. This increase in procedural volume adds to the overall workload of the care providers. Advances in technology have been incorporated into health care and the practice of medicine from electronic text messaging to robotic surgery. Some goals of this technology integration include improved efficiency, patient outcomes, surgical precision, and quality. Patient communications with questions or concerns are especially important during the early postoperative period, as unplanned calls, messages, and clinic visits can occur at a higher rate. Technology can provide more direct access to the provider team in a society of near instantaneous electronic connectivity. There is a paucity of literature that addresses communication in the early postoperative period for TJA. Our study aimed to analyze patient communication methods within the first postoperative month by quantifying phone calls and electronic messages from patients. Additionally, we sought to relate unplanned patient communication frequency to predict emergency department (ED) visits during the early postoperative period following TJA.

METHODS:

This was a retrospective review of all patients undergoing primary total hip arthroplasty (THA), total knee arthroplasty (TKA), or unicompartmental knee arthroplasty (UKA) by fellowship-trained adult reconstruction surgeons between 2017 and 2022. Patient demographics and total number of office communications were collected (including phone calls and messages). Phone calls were defined as any call between a member of the orthopaedic department and the patient pertaining to their postoperative care. Only messages sent by patients qualified as electronic text messages (ETMs). Patient ED visits within 30 days of their arthroplasty procedure were collected. Patients were also categorized by robotic versus manual arthroplasty procedures. Statistical comparisons were made using chi-square and student t-test, where appropriate. Regression analyses were performed to define the relationship between number of phone calls, ETMs, total contacts, and ED visits during the 30-day postoperative period. P-values of <0.05 were considered statistically significant.

RESULTS:

There were 12,300 consecutive primary robotic and manual arthroplasty procedures performed on 10,908 patients. TKA was the most commonly performed procedure in both the robotic and manual arthroplasty cohorts, comprising 48% and 59% of procedures, respectively. This was followed by THA (36.4% vs. 37%) and UKA (15.9% vs. 4.3%). Overall, 905 (40.4%) of the robotic arthroplasty patients and 2,012 (23.2%) of the manual patients sent an ETM (p<0.0001). On average, patients who underwent robotic arthroplasty sent 4.31 ETMs, compared to 3.96 in the manual arthroplasty cohort (p=0.041). Generally, 1,942 (86.6%) patients in the robotic and 6,417 (74%) patients in the manual group had at least one phone call within the first postoperative month (p<0.0001). No statistically significant difference in the average number of calls were observed between the two cohorts. Logistic regression analysis showed an odds ratio (OR) of 1.144 (95% CI 1.097-1.193, p<0.01) and 1.185 (95% CI 1.087 - 1.291, p<0.01) between the number of phone calls and emergency department visits within 30 days after TJA in the manual and robotic arthroplasty cohorts, respectively.

DISCUSSION AND CONCLUSION:

We found robotic arthroplasty patients to have a higher number of unplanned patient contacts within 30-days following TJA and place greater communication burden on the orthopaedic care team. Additionally, patients with more postoperative phone calls were associated with a greater risk of having an ED visit within the first 30 days after TJA. Understanding the factors behind higher postoperative unplanned communication can help orthopaedic providers with resource utilization and potentially reduce postoperative ED visits and associated healthcare costs.

	Robotic Arthroplasty	Manual Arthroplasty	p-value
Cases, n	2466	9834	
TKA	1184 (48%)	5778 (58.8%)	**<0.01**
Unicompartmental	393 (15.9%)	418 (4.3%)	
THA	889 (36.4%)	3638 (37%)	
Mean age, years (SD)	64.5 (10.3)	65.4 (10.6)	**0.02**
BMI, mean (SD)	31.9 (5.7)	33.3 (61.8)	**<0.01**
Male, n (%)	1114 (45.1%)	4190 (42.6%)	**0.01**
Laterality, n (%)			
Right	1252 (50.8%)	5076 (51.6%)	0.74
Bilateral	55 (2.2%)	198 (2%)	
Race, n(%)			
White	2377 (96.4%)	9505 (96.7%)	
Unable to obtain	16 (0.6%)	40 (0.4%)	
American Indian or Alaska Native	3 (0.1%)	16 (0.2%)	0.20
Black	55 (2.2%)	185 (1.9%)	
Other	2 (0.1%)	15 (0.2%)	
Asian	7 (0.3%)	57 (0.6%)	
Hawaiian or Pacific Islander	6 (0.2%)	16 (0.2%)	
Tobacco use, n(%)			
Current	331 (13.4%)	1051 (10.7%)	**<0.01**
No	2135 (86.6%)	8783 (89.3%)	
Marital status, n (%)			
Married	1555 (63.1%)	5838 (59.4%)	**<0.01**
Single	911 (36.9%)	3996 (40.6%)	
Insurance status, n (%)			
Private (including GHP)	1525 (61.8%)	5859 (59.6%)	
Medicare / Medicaid	890 (36.1%)	3659 (37.2%)	**<0.01**
Military / Government	36 (1.5%)	216 (2.2%)	
No Fault / Work Comp	12 (0.5%)	78 (0.8%)	
Uninsured	3 (0.1%)	22 (0.3%)	

Table 1. Baseline demographics for all included cases stratified procedure type (robotic vs manual)

ELECTRONIC TEXT MESSAGING (ETM)				
	Total	Robotic Arthroplasty	Manual Arthroplasty	p-value
Patients who had procedure	10908	2241	8667	
Patients sending ETMs within 30 days of their TJA, n (%)	2917 (26.7%)	905 (40.4%)	2012 (23.2%)	**<0.01**
Number of ETMs between patients and orthopaedic department, n (messages per patient)	11872 (4.07)	3902 (4.31)	7970 (3.96)	**<0.05**
Days messages were sent, n (%)				
Monday	2204 (18.6%)	752 (19.3%)	1452 (18.2%)	
Tuesday	2279 (19.2%)	779 (20%)	1500 (18.8%)	
Wednesday	2106 (17.7%)	709 (18.2%)	1397 (17.5%)	**<0.05***
Thursday	2014 (17%)	619 (15.9%)	1395 (17.5%)	
Friday	1769 (14.9%)	596 (15.3%)	1173 (14.7%)	
Saturday	685 (5.8%)	212 (5.4%)	473 (5.9%)	
Sunday	815 (6.9%)	235 (6%)	580 (7.3%)	

Table 2. Description of patient electronic text messages (ETM) for all included patient stratified by TJA procedure types (robotic vs manual). *: Chi-square test performed for messages sent during the weekend vs weekday for each arthroplasty group.

PHONE CALLS				
	Total	Robotic Arthroplasty	Manual Arthroplasty	p-value
Patients who had procedure	10908	2241	8667	
Patients with a phone call within 30 days of their TJA, n(%)	8359 (76.6%)	1942 (86.6%)	6417 (74%)	**<0.01**
Number of phone calls between patients and orthopaedic department, n (calls per patient)	20865 (2.49)	4826 (2.49)	16039 (2.49)	0.72
Days of the phone call, n (%)				
Monday	5060 (24.3%)	1115 (23.1%)	3945 (24.6%)	
Tuesday	3719 (17.8%)	880 (18.2%)	2839 (17.7%)	
Wednesday	3693 (17.7%)	860 (17.8%)	2833 (17.7%)	0.49*
Thursday	3868 (18.5%)	928 (19.2%)	2940 (18.3%)	
Friday	4243 (20.3%)	973 (20.2%)	3270 (20.4%)	
Saturday	175 (0.8%)	46 (1%)	129 (0.8%)	
Sunday	107 (0.5%)	24 (0.5%)	83 (0.5%)	

Table 3. Description of patient phone calls for all included patient stratified by TJA procedure types (robotic vs manual). *: Chi-square test performed for messages sent during the weekend vs weekday for each arthroplasty group.

	Total	Robotic Arthroplasty	Manual Arthroplasty	p-value
Patients sending ETMs within 30 days of their TJA, n (%)				
TKA	1563 (53.6%)	465 (51.4%)	1098 (54.6%)	0.10
UKA	248 (8.5%)	174 (19.2%)	74 (3.7%)	**<0.01**
THA	1106 (37.9%)	266 (29.4%)	840 (41.7%)	**<0.01**
Number of ETMs between patients and orthopaedic department, n (messages per patient)				
TKA	6740 (4.31)	2121 (4.6)	4619 (4.2)	0.15
UKA	912 (3.65)	665 (3.8)	247 (3.3)	0.33
THA	4220 (3.49)	1116 (4.2)	3104 (3.3)	0.09
Patients with a phone call within 30 days of their TJA, n(%)				
TKA	4638 (55.5%)	903 (46.5%)	3735 (58.2%)	**<0.01**
UKA	560 (6.7%)	322 (16.6%)	238 (3.7%)	**<0.01**
THA	3151 (37.7%)	707 (36.9%)	2444 (38.1%)	0.23
Number of phone calls between patients and orthopaedic department, n (calls per patient)				
TKA	12429 (2.68)	2311 (2.6)	10118 (2.7)	**<0.05**
UKA	1307 (2.32)	806 (2.5)	501 (2.1)	**<0.01**
THA	7129 (2.24)	1709 (2.4)	5420 (2.2)	**<0.01**

Table 4. Description of post-operative patient communications for all included patients stratified by anatomic procedure types.

Variables (for Manual Arthroplasty)	OR for Emergency Room Visit(s) (95%-CI)	p-value
Electronic Text Messages	1.004 (0.975 – 1.033)	0.80
Phone calls	1.144 (1.097 – 1.193)	**<0.01**
Total contacts	1.042 (1.021 – 1.064)	**<0.01**
Variables (for Robotic Arthroplasty)	OR for Emergency Room Visit(s) (95%-CI)	
Electronic Text Messages	1.039 (1 – 1.079)	0.49
Phone calls	1.185 (1.087 -1.291)	**<0.01**
Total contacts	1.062 (1.029 – 1.096)	**<0.01**

Table 5: Logistic regression model for ER visit within 30 days s/p TJA