
Understanding why caregivers call after ambulatory pediatric urologic surgery

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CHANG E, NICASSIO L, WHALEN J, CHENG J, MERGUERIAN P, LENDVAY TS, AHN J. Understanding why caregivers call after ambulatory pediatric urologic surgery. *Can J Urol* 2022;29(4): 11243-11248.

Introduction: To uncover factors associated with an increased likelihood of a postoperative triage phone call from caregivers after pediatric ambulatory urologic surgery with a focus on social determinants of health.

Materials and methods: This was a retrospective cohort study from July 2014–January 2020. Patients undergoing ambulatory urologic surgery by three different pediatric urologists were included. The primary outcome was the number of patient families that called within 30 days after surgery. Univariable tests and multivariable logistic regression analysis were used to identify factors associated with the increased likelihood of a postoperative phone call.

Results: The families of 460 patients out of 1618 patients called at least once within 30 days of surgery (28%). There were 665 total calls, an average number of 1.5 (SD+/-0.8)

phone calls per family. Families who live further away (OR 0.66, 95%CI 0.46-0.93), who do not speak English as a primary language (OR 0.61, 95%CI 0.38-1.00), and who were Native American/Alaskan Native (OR 0.33, 95%CI 0.11-0.99) were less likely to call after surgery. Those with commercial insurance (OR 1.42, 95%CI 1.09-1.85), recovering from non-hypospadias penile surgery (OR 3.20, 95%CI 2.46-4.32), or from hypospadias repair (OR 5.14, 95%CI 3.28-8.18) were more likely to call after surgery.

Conclusions: Nearly 1 in 3 families call the hospital triage line after ambulatory urologic surgery with postoperative concerns. Families with children who undergo penile surgery are 3-5 times more likely to call after surgery. Social determinants of health may have a role in postoperative phone call rates as medically underserved patients are less likely to call.

Key Words: pediatric urology, health disparities, postoperative phone call, ambulatory surgery, circumcision, hypospadias

Introduction

Undergoing surgery, no matter how minor, is a stressful time for pediatric patients and their parents/caregivers.^{1,2} Although ambulatory surgery has

benefits for the patient, the patient's caregivers, and the healthcare system, it requires the child's caregivers to manage the majority of the postoperative care. This is not an easy task, especially if the caregivers feel insufficiently prepared, need to manage various symptoms (fever, pain, vomiting, etc.), speak a foreign language, or have a child who never had surgery.¹ Due to these challenges, caregivers might utilize the healthcare system for additional assistance. A recent study by Arpey et al demonstrated that after pediatric urologic surgery, almost 40% of patients required an

Accepted for publication May 2022

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unscheduled clinical encounter where 90% of these encounters were telephone calls.³ Postoperative telephone triage calls are often answered by nurses, advanced practice providers and physicians. Although they are helpful in decreasing emergency room (ER) utilization, they are still burdensome to the healthcare system.⁴ Many of the questions asked during the phone calls have already been addressed in the surgeon's postoperative consultation and printed instructions. This is not surprising given postoperative instructions can be specific and complex, and retaining medical information can be difficult.^{5,6}

Although there are data to understand reasons for ER visits and readmissions after pediatric urologic surgery, there are limited data on factors associated with increased postoperative telephone triage calls in the pediatric urologic ambulatory surgery setting.^{7,8} The study by Arpey et al was limited because they included both inpatient and outpatient surgeries and had only 202 patients.³ Nevertheless, they suggested that operations on specific areas of the body (urethra/ureter) or discharging with the catheter were associated with increased unscheduled clinical encounters. In this study, we aim to better understand the factors associated with the increased likelihood of a postoperative triage phone call after ambulatory surgery. In addition to clinical factors, we focus on social determinants of health (SDOH) including race, distance from the hospital, primary language, and insurance status. SDOH are non-medical factors such as social and economic conditions that influence an individual or group's health. These factors include but are not limited to income, education, race, insurance status, work, and primary language.⁹ We studied SDOH because they considerably affect health outcomes and patient interactions with the healthcare system. For example, children with no insurance have higher mortality from trauma compared with children with public or commercial insurance.¹⁰ Children with no insurance or with public insurance have higher emergency room utilization compared to those with commercial insurance.¹¹ Given these types of findings, our hypothesis in our study was that families from groups who historically have more difficulty accessing care (ex. families that do not prefer English as their language of care or Medicaid-insured families) would call more after pediatric urologic ambulatory surgery.

Materials and methods

Data source

This was a retrospective cohort study performed after Institutional Review Board approval. Subject

information including demographics, diagnosis, and surgical information were identified via our hospital system's internal data management system that is linked to the electronic medical record (EMR). A manual retrospective chart review of the EMR was also done to obtain information regarding the postoperative triage phone calls.

Study population

Patients with urological procedures performed at an ambulatory surgery center from July 2014-January 2020 were identified. The population was restricted to patients whose procedures were performed by three fellowship-trained urologists at our institution. Using Current Procedural Technology (CPT) codes, patients who underwent the following procedures were included: correction of penile angulation, phalloplasty, circumcision, cystoscopic procedures, hernia repair, orchiopexy, orchiectomy, hydrocele repair, hypospadias repair, lysis of penile adhesions, and meatotomy. Any patient who required overnight admission was excluded.

Outcomes

The primary outcome of interest was whether or not a patient's family called in the 30 days after the procedure. Calls were identified by reviewing the correspondence encounters in each patient's EMR. Calls made by the institution for routine follow up or calls after 30 days were excluded. The frequency, date, and question/concern that prompted the call were recorded. The total number of calls, in addition to the total number of families that called, were recorded. This reason for calling was classified into one of five groups: wound appearance, dressing, pain, postoperative activity/care, and fever.

Additional patient information such as demographics, diagnosis, and surgical information were collected. Demographics included patient age and sex in addition to SDOH such as distance from hospital based on zip code, preferred language of care (English vs. Non-English), race/ethnicity, and insurance status. The surgical information collected included the date and the CPT code associated with the procedure. The procedures were condensed into 5 groups based on type of surgery: 1) Penile (non-hypospadias) which included procedures such as correction of penile angulation or phalloplasty and circumcision; 2) Inguinal/scrotal which included procedures such as hernia repair, orchiopexy, orchiectomy, and hydrocelectomy; 3) Hypospadias repair; 4) Cystoscopic procedures which included procedures such as Deflux injections and diagnostic

cystoscopy. Ureteroscopy was not included in this study; 5) Minor procedures which included procedures such as lysis of penile adhesions and meatotomy.

Using this information, we identified which variables were associated with an increased likelihood of a postoperative triage phone call.

Statistical analysis

Statistical analysis was done with Stata 14 (College Station, TX, USA). Univariate analyses were performed using Chi-square test for categorical variables and Mann-Whitney test for continuous variables. A multivariate logistic regression model was created to evaluate clinical and demographic variables associated with a postoperative phone call. All tests were two-sided and a p value less than 0.05 was considered statistically significant.

Results

A total of 1618 patients were included in our analysis. The families of 460 patients (28%) called at least once within 30 days of surgery. There was a total of 665 calls with the average number of 1.5 (SD +/- 0.8) phone calls per family. Table 1 shows the study population's overall demographics and characteristics. Younger age of the patient, English being the primary language of care, having commercial insurance, undergoing penile surgery, and living closer to the hospital were all associated with a higher likelihood of a P-O phone call on univariate analysis. Table 1 also demonstrates that non-hypospadias penile surgeries (38%) and hypospadias repairs (49%) generated at least twice as many postoperative phone calls as the other types of surgeries (inguinal/scrotal, cystoscopic, and minor).

TABLE 1. Patient demographics and univariate analysis of factors associated with postoperative phone call

	Total	No call	Call
N	1618	1158 (72%)	460 (28%)
Median age (IQR) (p < 0.001)	3.1 (1.0-7.8)	3.4 (1.1-7.8)	1.9 (0.8-7.3)
Median distance from hospital (IQR) (p < 0.001)	26 (16, 51)	28 (16, 59)	22 (15, 45)
Sex (p = 0.06)			
Male	1576 (97%)	1123 (71%)	453 (29%)
Female	42 (3%)	35 (83%)	7 (17%)
Language of care (p = 0.01)			
English	1473 (91%)	1041 (71%)	432 (29%)
Other	145 (9%)	117 (81%)	28 (19%)
Race/ethnicity (p = 0.09)			
White	813 (50%)	575 (71%)	238 (29%)
Asian/Pacific Islander	272 (17%)	183 (67%)	89 (33%)
Hispanic	158 (10%)	123 (78%)	35 (22%)
Black	139 (9%)	99 (71%)	40 (29%)
Native American or Alaska Native	29 (2%)	25 (86%)	4 (14%)
Other	207 (13%)	153 (74%)	54 (26%)
Insurance (p = 0.001)			
Commercial	938 (58%)	637 (68%)	301 (32%)
Medicaid	648 (40%)	498 (77%)	150 (23%)
Tricare	30 (2%)	22 (73%)	8 (27%)
Self-pay	2 (0%)	1 (50%)	1 (50%)
Surgery type (p < 0.001)			
Penile (not hypospadias)	765 (47%)	476 (62%)	289 (38%)
Inguinal	521 (32%)	435 (83%)	86 (17%)
Hypospadias	106 (7%)	54 (51%)	52 (49%)
Cystoscopy	58 (4%)	48 (83%)	10 (17%)
Minor	168 (10%)	145 (86%)	23 (14%)

TABLE 2. Multivariate analysis of factors associated with postoperative phone calls

Characteristic	OR	95% CI
Age		
0-12 months	Ref	
1-3 years	0.78	0.56-1.07
> 3 years	0.87	0.65-1.16
Primary language		
English	Ref	
Non-English	0.61	0.38-1.00
Race/ethnicity		
White	Ref	
Asian/Pacific Islander	0.87	0.63-1.20
Hispanic	0.92	0.58-1.45
Black	0.94	0.61-1.45
Native American or Alaska Native	0.33	0.11-0.99
Other	0.87	0.60-1.25
Insurance		
Medicaid/Tricare	Ref	
Commercial	1.42	1.09-1.85
Procedure type		
Inguinal	Ref	
Penile (not hypospadias)	3.20	2.46-4.32
Hypospadias	5.14	3.23-8.18
Cystoscopic	0.98	0.47-2.04
Minor	0.81	0.49-1.33
Distance from hospital (mile percentile)		
0-25th%	Ref	
26-50th%	0.80	0.59-1.10
51-75th%	0.64	0.46-0.89
> 75th%	0.66	0.46-0.93

The multivariate analysis in Table 2 confirms that non-hypospadias penile surgeries (OR 3.20, 95% CI 2.46-4.32) and hypospadias repairs (OR 5.14, 95% CI 3.23-8.18) were the most likely to generate phone calls. In addition, those with commercial insurance

were more likely to call than those with Medicaid (OR 1.42, 95% CI 1.09-1.85). Families who live further away (OR 0.66, 95% CI 0.46-0.93), families for whom English is not the preferred language of care (OR 0.61, 95% CI 0.38-1.00), and Native American or Alaskan Native families (OR 0.33, 95% CI 0.11-0.99) were less likely to call after surgery. Table 3 reveals the different reasons for postoperative phone calls with appearance of the wound accounting for 50% of phone calls.

Discussion

To date, this is the first study in the pediatric literature that specifically characterizes postoperative triage phone call rates after pediatric ambulatory urologic surgery. This is also the first study to identify different

TABLE 3. Reasons for postoperative phone call

Reason for call	Total Calls (%)
Appearance	331 (50%)
Postop care	127 (19%)
Dressing	109 (16%)
Pain	85 (13%)
Fever	13 (2%)

factors associated with a higher likelihood of a postoperative phone call in this population. In our study, nearly a third of families called the hospital triage line after ambulatory urologic surgery with some families calling multiple times. Although an “unnecessary” postoperative phone call is not as unfavorable as a non-indicated ER visit, this high postoperative phone call rate may be an indication that caregivers are not being adequately educated or counseled on how to take care of the patient at home. It may also be an indication of caregiver frustration or preventable concern. Furthermore, responding to triage phone calls can be burdensome for healthcare staff.¹²

Our analysis demonstrates that caregivers of patients who underwent penile surgery were 3–4 times more likely to call. This is not surprising given that the majority of ER visits after pediatric urology surgeries are after outpatient penile surgery.⁸ In addition, 50% of the calls in our study were due to appearance of the wound. Most caregivers do not know what their child’s penis should look like after surgery. Unfortunately, high postoperative care utilization after pediatric penile surgery is a difficult problem to solve. Danzig et al showed that even a photographic atlas did not necessarily decrease postoperative care utilization as the phone call rates were not different between caregivers who received the atlas and those who did not.¹³ Other institutions, however, have successfully implemented a photographic atlas in their postoperative care instructions for ambulatory penile surgery and decreased postoperative calls and emails.^{14,15} Our institution recently created a penile post-surgical atlas and is currently working on incorporating it for this purpose. We are also working on a series of online videos that discusses perioperative care for ambulatory urologic surgery to better equip caregivers to take care of their children at home. Lastly, some of our providers have begun asking caregivers to audio record their postoperative instructions so that caregivers can refer back to the recording when they have questions. This is a low-cost, underutilized, and well-liked method of helping patients retain medical information, especially in the field of oncology.^{16,17} It is possible that a combination of interventions such as using a photographic atlas, online video instructions, postoperative recordings, and simplifying dressings (as 35% of calls in our cohort were related to postoperative care or dressing management) can significantly reduce postoperative care utilization.

Our analysis of SDOH and the likelihood of a postoperative phone call was surprising. We expected families that were part of groups who historically have more difficulty accessing care (families who live further

away, families that do not use English as their language of care, or Medicaid-insured families) to call more frequently given that these families may not have the resources or time to come in for postoperative visits. Therefore, postoperative calls could be cost-effective and time-efficient way for them to receive guidance from health professionals. Nevertheless, the opposite was true in our study. Families that live further away, families that do not use English as their language of care, Native American and Alaska Natives, and those with Medicaid were less likely to call after surgery.

This may be an indication that those who struggle to access the healthcare system are less likely to use the hospital triage phone line because they do not know the triage line is an available resource. Others may not feel that it is a valuable resource or have barriers to using it. For example, non-English-speaking families may find that needing an interpreter to speak with someone over the phone to be a barrier they are unwilling to overcome. Although the reasons are not entirely clear, this is an important finding that our institution plans to investigate further as we continue to pursue equitable care for all of our patients. It may be imperative to encourage families who are less likely to call after surgery to actually use the hospital triage line to ensure they know how to properly take care of the patient and/or prevent unnecessary emergency room or urgent care visits. This can be done in an instructional online video, postoperative recording, or written instructions in their preferred language of care.

The main limitation of our study is that it is retrospective. As a result, we needed to use CPT codes and manual chart review, which can produce inaccurate data. Second, we originally hoped that this project would be a quality improvement project to help our individual surgeons identify ways to decrease their rates of postoperative triage phone calls after ambulatory urologic surgery. Originally the data were analyzed stratified by each surgeon. Although our preliminary data showed that there were differences in phone call rates among surgeons, we also learned that the surgeons’ patient populations were inherently different. For example, Surgeon 3’s patient population were older, had fewer Native English speakers, and lived further away. Since these factors were associated with whether patient families call after surgery, strong conclusions comparing the surgeons could not be made. Lastly, it is also unclear from our data why certain patient groups were less likely to call and therefore additional investigation is needed. Nevertheless, our results reveal specific factors, especially social determinants of health, associated with a higher likelihood of a postoperative call.

Conclusion

Nearly a third of families call the hospital triage line after ambulatory urologic surgery with postoperative concerns or questions, suggesting that there is still room for improvement in pediatric urologists' postoperative management and counseling. Strategies such as visual and audio tools may be needed to reduce unnecessary phone calls, mainly for penile surgeries. Families with patients that undergo penile surgery, that live closer, or that have commercial insurance are much more likely to call after surgery. Medically underserved patients (non-English speaking, insured by Medicaid, Native American / Alaska Natives, and living further away) are less likely to call. This phenomenon needs further investigation to ensure equitable care. □

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