



## ORIGINAL RESEARCH

# Outcomes of a postoperative day one call to families after adenotonsillectomy in children

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## Abstract

**Objective:** To examine the outcomes of a postoperative day one (POD 1) phone call to families of ambulatory surgical patients, as a means of guiding clinical interventions and quality initiatives, with a focus on children undergoing adenotonsillectomy (T&A).

**Methods:** Retrospective analysis of outcomes of a POD 1 questionnaire completed in children <18 years of age undergoing T&A at a tertiary care children's hospital over a 3-year period (August 14, 2018–August 31, 2021).

**Results:** Responses to the questionnaire were obtained for a total of 1428/3464 (41.2%) children undergoing T&A during the study period. There was no difference in gender, age at surgery, race, ethnicity, insurance product, or preoperative diagnosis for those whose caregiver responded to the questionnaire versus those who did not. Parent responses included 84 (5.9%) who reported problems or concerns post-discharge. These included 18 (1.3%) patients unable to take their pain medication, 9 (0.6%) refusing oral intake, 28 (2.0%) with postoperative emesis, 27 (1.9%) with fevers, and 6 (0.4%) with a change in breathing. A total of 75/122 (61.5%) who reported pain were taking their pain medication as directed. Nineteen (1.3%) patients were noted to have bleeding after surgery, including 4 (21.5%) with nosebleeds, and 12 (63.2%) with oral cavity bleeding requiring no interventions.

**Conclusions:** The POD 1 questionnaire identified patients with common concerns and complications after T&A. Although most of these concerns were infrequent, it afforded the clinical team the opportunity to provide additional education and instructions on care and management to caregivers after their child's surgical procedure.

## KEYWORDS

adenotonsillectomy, postoperative complications, postoperative phone follow-up

Level of Evidence: 4.

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## 1 | INTRODUCTION

Tonsillectomy with or without adenoidectomy (T&A) is the most common major surgical procedure performed in the United States with about 500,000 procedures occurring per year. Clinical Practice Guidelines (CPGs) outline instances when children undergoing T&A should be monitored overnight, but most healthy children over the age of 3 years undergo the procedure on an outpatient basis.<sup>1</sup> With many children being discharged within a few hours of their surgery, there may be little time for parents to gain an understanding of the expectations of their role and responsibilities in caring for their child.<sup>2-5</sup> Although standard preoperative education is often provided to families of children considering surgery, and some institutions evaluate children with an in-person preoperative visit,<sup>6,7</sup> there still may be gaps in parental understanding of the needs of a child after surgery. Postoperative follow-up is therefore an important means of monitoring for successful outcomes after surgical care, and for an assessment of any complication or concerns with pain management.<sup>2,4,8,9</sup> Prior studies have demonstrated effectiveness and patient/parent satisfaction with a standard postoperative telephone call after outpatient surgical procedures.<sup>3,10-12</sup>

Follow-up phone calls have been shown to be an efficient and cost-effective means of monitoring children after outpatient surgery.<sup>12,13</sup> The calls not only evaluate for potential problems and complications, but they also provide an opportunity to relay additional information to families on managing pain, postoperative nausea and vomiting, and other postoperative concerns.<sup>2-5</sup> In addition, the call may serve to waylay anxiety experienced by family members and may serve to provide reassurance and a sense of caring.<sup>14</sup> Previous work from our institution analyzed outcomes of an electronic health record (EHR) data extraction tool utilized to assess outcomes 3-4 weeks after T&A.<sup>15</sup> Although the analysis demonstrated satisfaction with surgical outcomes, the information collected did not provide specific information on immediate outcomes after outpatient T&A related to adequate pain management and frequency of complications.

The aim of the current study is to analyze the results of a postoperative day one (POD 1) phone call to families of children undergoing outpatient T&A at a tertiary care children's hospital and satellite locations. Data were entered into an EHR template allowing for collection of information from all patients completing the call, to look for trends in common postoperative complications or concerns, and to assess for the incidence of complications requiring further interventions or contact from the otolaryngology team. These descriptive data could provide a means of identifying areas of gaps in education of family members about the care of their children in the immediate postoperative period after T&A, with the goal of allowing for development of additional educational tools and modalities.

## 2 | METHODS

The study was approved by the Institutional Review Board of the Ann & Robert H. Lurie Children's Hospital of Chicago (IRB#2019-

3094). All parental responses were included for those children undergoing either outpatient tonsillectomy or T&A from August 14, 2018-August 31, 2021. Patients were excluded from analysis who underwent a lingual tonsillectomy, who underwent cautery for posttonsillectomy hemorrhage, who had adenoidectomy alone, or who were > 18 years of age. Patients were not excluded who underwent additional otolaryngology procedures at the time of their T&A (myringotomy and tube placement, nasal cautery, frenulectomy, and turbinate reduction).

Parents were contacted 24-48 h (Saturday surgery patients contacted on following Monday-for purposes of manuscript will be considered POD 1 call) after the child's surgical procedure by the perioperative nurse team, familiar with the care of postoperative patients, and responses to the standard questions (Table 1) recorded in the EHR template. A third-party phone interpreter was utilized when completing the call to non-English speaking families. Attempts were made to contact the families at least twice, sometimes on consecutive days, by the nurse team. If the family responded and answered the postoperative questions, their responses were noted in the EHR template. On-call physicians or otolaryngology nurses were notified immediately (the call was either transferred to otolaryngology nurse pool or on-call physician paged) of any urgent patient concerns noted in the phone encounter, that is, bleeding at the surgical site, uncontrolled pain or emesis, or other postoperative concerns at the discretion of the nurse completing the call.

Overall responses to the questions for those completing the phone call were gathered by the institutional Data Analytics Resource team. Responses for family members who completed all or some of the questions were further analyzed. Additional analysis related to a

**TABLE 1** Postoperative day 1 phone call survey questions and possible responses

Questions	Possible responses
Problems or concerns postdischarge	Yes/no
Postprocedure pain medications	Tylenol/motrin; opioid; other
Comfort level	Pain controlled, pain controlled-taking pain medication, pain not controlled, pain not controlled-not taking pain medication
Current diet	Refusing all PO, tolerating clear liquids only, soft solids/liquids, normal diet
Vomiting	Yes/no
Fever	Yes/no
Any change in breathing	Yes/no
Activity	Return to preop, quiet activity, sleepy, minimal activity
Wound care/cast care	N/A
Instructed to follow-up with doctor	Yes/no
Any bleeding at site/dressing	Yes/no

question on wound care/healing were not tabulated, since would not pertain to post-T&A patients.

Analysis of the data included gender, patient age at surgery, ethnicity, race, insurance product, preoperative diagnosis, and the responses to the POD 1 questionnaire. The EHR of those with blood at the surgical site were further analyzed to determine the severity of the issue and need for intervention. Responses to a question about pain levels and adherence to pain medication was recorded. Postoperative pain management was consistent among all physicians, to include alternating ibuprofen and acetaminophen every 3 h, with the option to prescribe oxycodone in children >5 years of age in the EHR order set. Additional data was gathered from the EHR for those patients referred to the otolaryngology team within 48 h of their procedure for concerns noted by the peri-operative nurse completing the phone call.

## 2.1 | Statistical analysis

Descriptive statistics were computed for the overall patient population with postoperative phone call, and the subpopulation of these patients with postoperative concerns. Frequencies and percentages were reported for the categorical variables, while means and standard deviations were presented for continuous variables after confirming normal distribution via histograms and QQ-plots. Chi-squared test or t-test was also used to examine differences in the characteristics of patients who did not complete the POD 1 call, compared to those patients who completed the call. Statistical significance was evaluated at  $p < .05$ . All statistical analyses were conducted using SAS Enterprise Guide (version 7.1, Cary, NC).

## 3 | RESULTS

A total of 3464 patients were contacted on POD 1 after T&A in the study period. Of these, 1428 (41.2%) completed this POD 1 questionnaire. Each call took an average of 3–5 min to complete by the perioperative nurse team member, with an average of 50 calls/day for all ambulatory surgery patients. There were no differences in gender, race, ethnicity, insurance product, preoperative diagnosis, or incidence of calls to an otolaryngology team member by POD 2 between those who completed the survey and those who did not (Table 2).

Of those who completed the questionnaire, 84 (5.9%) stated they had problems postdischarge. Twenty-eight (2%) patients reported vomiting, 27 (1.9%) reported fever, and 6 (0.4%) reported a change of breathing (Table 3). Most patients ( $n = 1094$ , 76.6%) were tolerating soft foods and liquids, and the activity level was most often described as “quiet activity.” A total of 19 patients (1.3%) reported bleeding at the surgical site. These included 4 (21.5%) with minor nosebleeds (3 had concurrent turbinate reduction), 12 (63.2%) with oral cavity bleeding requiring no interventions, and 2 (10.5%) seen in the emergency department for bleeding. One patient required repeat cautery in the operating room the day of their surgery.

**TABLE 2** Features of the study population who completed the POD 1 questions compared to those who did not complete a postoperative phone follow-up (total  $n = 3464$ )

Characteristic	n (%) patients POD 1 phone call total n = 1428	n (%) patients no. POD 1 phone call total n = 2036	p value <sup>a</sup>
Average age (years)	7.0 (3.8)	7.0 (3.6)	.97
<i>Gender</i>			
Male	739 (51.8)	1080 (53.1)	
Female	689 (48.3)	956 (47.0)	.45
<i>Ethnicity</i>			
Non-Hispanic-Latino	851 (59.6)	1206 (59.2)	
Hispanic-Latino	536 (37.5)	773 (38.0)	.81
Missing data <sup>a</sup>	41 (2.9)	57 (2.8)	
<i>Race</i>			
White	652 (45.7)	925 (45.4)	
Black/African American	180 (12.6)	239 (11.7)	
Asian	42 (2.9)	78 (3.8)	.48
Other	512 (35.9)	736 (36.2)	
Missing data <sup>a</sup>	42 (2.9)	58 (2.9)	
<i>Insurance product</i>			
Blue cross/blue shield	433 (30.3)	586 (28.8)	
Medicaid	790 (55.3)	1127 (55.4)	.63
Managed care/other	201 (14.1)	301 (14.8)	
Missing data <sup>a</sup>	4 (0.3)	22 (1.1)	
<i>Preoperative diagnosis</i>			
Tonsillar hypertrophy	122 (8.5)	180 (8.8)	
Sleep disturbance/OSA	995 (69.7)	1453 (71.4)	
Tonsillitis	133 (9.3)	169 (8.3)	.46
Other	13 (0.9)	12 (0.6)	
Missing data <sup>a</sup>	165 (11.6)	222 (10.9)	
Call to otolaryngology provider within 48 hours of surgery	152 (10.6)	216 (10.6)	.97

Abbreviation: OSA, obstructive sleep apnea.

<sup>a</sup>p values calculated excluding missing observations.

All patients were discharged with postop pain medications, and instructions on use were provided verbally and written. A total of 1034 (72.4%) of all patients reported taking their pain medications as directed, although a description of their pain level was not included. Of those who reported no pain, 104 (42.1%) were taking their medication as prescribed, and 3 (1.2%) were not. Of those who stated they were in pain, 75 (61.5%) were taking their pain medications as directed (Table 4).

## 4 | DISCUSSION

Caring for children after outpatient surgical procedures can be challenging for parents, who may have limited understanding of treatment

**TABLE 3** Responses to the POD 1 phone call questions (*n* = 1428)

Questions	Yes <i>n</i> (%)	No <i>n</i> (%)	Null <i>n</i> (%)
Problems or concerns postdischarge	84 (5.9)	1283 (89.9)	61 (4.3)
Postprocedure pain medications	1410 (98.7)	18 (1.3)	0 (0)
Current diet			
Refusing all PO	9 (0.6)		
Tolerating clear liquids only	102 (7.1)	N/A	0 (0)
Soft foods/liquids	1094 (76.6)		
Normal diet	223 (15.6)		
Vomiting	28 (2.0)	1400 (98.0)	0 (0)
Fever	27 (1.9)	1401 (98.1)	0 (0)
Any change in breathing	6 (0.4)	1422 (99.6)	0 (0)
Activity			
Quiet activity	936 (65.6)		
Return to preop	453 (31.7)	N/A	0 (0)
Sleepy	13 (0.9)		
Minimal activity	26 (1.8)		
Instructed to follow-up with doctor	813 (56.9)	463 (32.4)	152 (10.6)
Any bleeding at site	19 (1.3)	1409 (98.7)	0 (0)

**TABLE 4** Responses to postoperative day (POD) 1 question asking about comfort level after T&A (total *n* = 1428)

POD 1 comfort level	<i>n</i>	% <sup>a</sup>
No pain	140	56.7
No pain: taking pain medication as directed	104	42.1
No pain: not taking pain medication as directed	3	1.2
Total no pain (% of total <i>n</i> )	247	17.3
Pain	43	35.2
Pain: taking pain medication as directed	75	61.5
Pain: not taking pain medication as directed	4	3.3
Total with pain (% of total <i>n</i> )	122	8.5
Unknown pain: taking pain medication as directed	1034	97.6
Unknown pain: not taking pain medication as directed	20	1.9
Unknown pain: unknown pain medication status	5	0.5
Total unknown pain (% of total <i>n</i> )	1059	74.2

<sup>a</sup>percentage of category except when indicated.

strategies for issues that can arise after surgery. Although postoperative instructions are routinely provided to family members, there still may be gaps in the information provided, or in a parent's understanding of how best to manage certain healthcare scenarios. Our study evaluated responses to a POD 1 phone call to families of children who had undergone outpatient T&A. The analysis demonstrated low rates of complications, including fever, vomiting, and changes in breathing, and allowed for identification of patients with bleeding at the surgical site. The call allowed the perioperative nurse to gather information on adequate pain management and provided an opportunity for additional counseling and instruction to family members. When appropriate, the perioperative nurse involved an

otolaryngology team member in managing patient care concerns. Information gathered from this phone call, and our standard 3–4-week postoperative call, has been essential to our restructuring of preoperative and postoperative education materials, and our postoperative order sets to best meet the needs of our families.

Telephone follow-up has been described as a means of exchanging information, providing health education and advice, managing symptoms, recognizing complications early, giving reassurance, and providing quality aftercare service.<sup>16</sup> Postdischarge phone calls have been shown to reduce the incidence of emergency department visits,<sup>17</sup> and the need for routine in-person visits after some surgical procedures.<sup>18,19</sup> Our analysis demonstrated opportunities to address issues of vomiting, fever, inadequate analgesia, and bleeding at the surgical sites with families. Although, due to the large sample size, specific recommendations to each family were not analyzed, opportunities to better educate families on appropriate interventions or need for communication with an otolaryngology team member were afforded by the postoperative phone call. Xin and colleagues<sup>13</sup> noted that a POD 1 T&A phone intervention reduced early-stage pain intensity felt to relate to the opportunity for the nurse to emphasize improved analgesia to promote better hydration.

In their analysis of >37,000 postoperative phone calls to pediatric postoperative patients, Brenn et al.<sup>11</sup> found pain to be the highest reported complication in 11.1% of their patients. Their study aimed to determine the rate of common postoperative complications, and to understand the reasons for patient/parent dissatisfaction. They found dissatisfaction to be rare (0.31%), with most parents citing process issues (waiting times, rushed out of recovery) as their reason for dissatisfaction. Other studies in children have shown satisfaction with telephone follow-up after hospital discharge after T&A, and other common pediatric and urology surgical procedures.<sup>19,20</sup> Our POD

1 questions did not include an assessment of patient satisfaction, although like their analyses, our data allowed the nurse to screen for potential complications, and to generate a better understanding of the rate of complications after a common surgical procedure.

Most parents reported that they were giving their child pain medications as directed during their phone encounter, although 75 (5.3%) reported pain despite giving pain medications as directed. The phone call gave the opportunity for the nurse to reinforce adequate dosing and timing of dosing for the medications. Calls could then be referred to the otolaryngology team member to determine if the addition of an opioid was needed (generally not prescribed to children <5 years of age, or not at all by some providers at our institution). When comparing those families who responded to the phone call to those who did not, the rate of calls to an otolaryngology team member within 48 h of surgery was similar. A reduced number of calls might have been anticipated for those who spoke to the nurse postoperatively, but the similar numbers in each group likely speaks to specific care needs after T&A (i.e., adequate analgesia), which required guidance by an otolaryngology team member. Moving the POD 1 calls to specialty-specific nursing team members could serve as means of reducing future calls, given their breadth of knowledge, although time demands for the calls would limit this ability.

Previous work from our institution demonstrated a higher rate of return visits to the ED after T&A than other surgical procedures.<sup>21,22</sup> Only 64% of patients were taking their pain medications as directed, and many required opioid analgesics while in the ED. POD 4 was the most common day children presented to the ED in our previous work, and the POD 1 phone call likely would not have impacted the frequency of these visits. Providing additional guidance and instructions to our patients around POD 4 may have value and is being investigated through electronic patient portal functionality at our institution.

Studies have demonstrated that nurse-led postoperative phone calls reduced parental anxiety in caring for their children after surgery.<sup>10,14</sup> Pieper et al.<sup>23</sup> suggested that the short duration between surgery and discharge, for those undergoing outpatient surgery, did not allow ample time for parents to ask questions. Within this time frame, the nurse would typically be responsible for reducing patient pain, addressing parent and patient anxiety, and providing home care instructions, including a summary of possible complications.<sup>14</sup> When receiving telephone counseling a reduction in hospital admissions, anxiety, and pain levels could potentially be realized, along with an opportunity to address urgent problems. Our POD 1 calls were made by experienced members of the perioperative nurse team, who routinely manage phase 2 of our T&A patients recovery process. Parents were informed that they would be receiving a POD 1 phone call, which was shown to provide reassurance to parents in a prior study.<sup>3</sup> Familiarity with the specific needs of T&A patients regarding pain management, dietary restrictions, bleeding at the surgical site, and other complications were beneficial to these parent interactions.

Our previous work analyzing our 3–4-week postoperative T&A phone calls from the otolaryngology nurse team was able to identify instances where postoperative bleeding had not been reported to a team member.<sup>15</sup> Like the previous study, this database analysis allowed for identification of patients with bleeding in the immediate

postoperative period, which, per the tonsillectomy in children CPG, was an important measure for physicians to track to allow for self-assessment of technique and outcomes.<sup>1</sup> Given our large, urban catchment area, patients could seek treatment at other medical centers for postoperative concerns, and the phone call allowed for another opportunity to capture incidence of postoperative bleeding and other complications. Although most patients who described minor bleeding after their procedure did not require intervention, capturing these data may allow for an analysis of the “true” incidence of bleeding after T&A, which may be otherwise underappreciated.

Limitations of a large database analysis include the inability to assess individual patient outcomes and specific interventions suggested, although the data were able to demonstrate the frequency of immediate complications after T&A in a large number of patients. Not all families responded to the phone call, although our data did not demonstrate a difference in characteristics of families who responded to the call when compared to those who did not, and this does represent a limitation in gathering complete postoperative feedback from all patients. The results presented are primarily descriptive, and although these data may lack the impact of comparative or quality studies, the information gathered allowed our team to assess the postoperative questions being utilized. Asking the “right” questions to understand the concerns and gaps in understanding of our patients was of value to our institution, as means of driving change in composition of the question template.

Our future work is focused on utilizing an electronic patient portal (MyChart) to communicate with our families pre- and postoperatively. Postprocedure alerts to families about dosing pain medication, and other postoperative expectations will be incorporated in the content. Such an intervention will allow for regular patient assessments without personnel limitations. Like phone calls, the success of this pathway could be impacted by parental responses to the prompts, and the limitation of functionality to only families signed up for the patient portal (not available to non-English speaking families at this time). Overall, the information gathered by the POD 1 call, combined with our 3–4-week phone call data, allowed for improvements in our education material provided to families before and after surgery and increased our awareness of the importance of continued open communication to our families about potential postoperative issues after T&A.

## 5 | CONCLUSIONS

The POD 1 phone call to T&A patients was able to provide data on the frequency of postoperative complications immediately after surgery, including fever, vomiting, bleeding, and poor pain control. The call afforded the perioperative nurse team the opportunity to further educate families on managing these issues, with an emphasis on optimizing pain management. Information gathered from POD 1 template provided opportunities for our team to standardize and improve education provided to our families to improve their overall surgical experience.

**CONFLICTS OF INTEREST**

The authors have no disclosures or conflicts of interest.

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