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ARTICLE

Same-day surgical cancellations in pediatric urology: identifying trends for quality improvement

Tyler Overholt Daniel,[1*] David Thole,[2] Randy Casals,[3] Anthony Atala,[3] Steve Hodges,[3] Marc Colaco[3]

[1]Division of Pediatric Urology, Children's Hospital of Pittsburgh, Pittsburgh, PA, USA
[2]School of Medicine, Wake Forest University, Winston-Salem, NC, USA
[3]Department of Urology, Atrium Health Wake Forest Baptist, Winston Salem, NC, USA

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Objectives: *Day of surgery cancellations present several workflow challenges that result in delay of care for patients and revenue loss for physicians. This study aimed to further understand same-day pediatric urology surgical cancellations, and the authors assessed identifiable trends for quality improvement over a one-year time period.*

Methods: *Same-day surgical cancellations were prospectively identified at a single tertiary care center, Atrium Health Wake Forest Baptist, from 01 October 2022 to 30 September 2023. Reasons for cancellation were recorded per the parent/legal guardian and categorized as an avoidable or unavoidable cause. Demographic data, surgical rescheduling, and lost operating room time were also recorded. Descriptive and bivariate analyses were performed as indicated.*

Results: *Of 2351 scheduled cases, 51 (2.2%) were cancelled the day of surgery. The most common cancellation type was a complete no-show with no reason provided from the family (39.2%). Of those with reported reasons, 54.8% were cancelled for avoidable causes. Of those cancelled, 66.7% were for patients of a minority race, with 11.8% of families indicating a need for translation services during visits. There was no difference in terms of race/ethnicity, distance lived from the hospital, or surgical type when comparing cancellation reason ($p > 0.05$). Only 51.0% of cases were rescheduled with a median delay of 38 days. A total of 59.3 h of operating room time was lost due to these cancellations.*

Conclusions: *Same-day cancellations were identified in 2.2% of planned pediatric urology cases over a one-year period, with the majority of patients cancelled for avoidable reasons. Of cancelled cases, only 51.0% were rescheduled by the family, with a median delay of over one month. Additionally, 2/3rd of patients identified as a minority race, with 11.8% requiring translation services. This represents a vulnerable population who may require additional counseling for optimal patient and provider outcomes.*

Key Words: surgery, same-day cancellation, quality improvement, pediatric, patient outcomes, operating time

Introduction

Day-of-surgery cancellations (DOSC) pose significant challenges to health care systems, with an impact on patient care, operational efficiency, and financial stability.[1,2] These disruptions can also lead to emotional distress for patients and families,[1–3] who often coordinate time off from work, arrange childcare, and travel long distances for planned surgical procedures.

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*Corresponding Author: Tyler Overholt Daniel.
Email: overholttl@upmc.edu

Additionally, DOSC leads to lost revenue and inefficient operating room (OR) management, with wasted surgical time and equipment.[4–9]

Pediatric cases are unique from adult cases for a variety of reasons. Children are more susceptible to acute illnesses like respiratory and gastrointestinal infections that may necessitate last-minute changes in surgical candidacy.[3,10] Children also depend entirely on caregivers for transportation, coordination of care, and adherence to pre-operative requirements. Factors such as caregiver work obligations, transportation issues, legal consent requirements, language barriers, and socioeconomic challenges can disproportionately affect pediatric populations.[3–6]

Gaps remain in understanding specific risk factors for same-day surgical cancellations within pediatric urology. Understanding these trends is critical for identifying modifiable risk factors and implementing quality improvement (QI) strategies to enhance patient and provider operational outcomes. Identifying these factors can guide targeted interventions to reduce same-day surgical cancellation rates, improve OR efficiency, and enhance patient and family experiences. In this study, same-day pediatric urology cancellations were assessed to identify patient-related factors and explore potential areas for QI. This analysis focused on cancellation prevalence, rescheduling rates, care delays, and demographic variables to identify vulnerable populations who may benefit from targeted interventions and additional counseling to optimize outcomes.

Material and Methods

Study design

The surgical schedule was prospectively queried on a daily basis for all pediatric urology cases at a single tertiary institution over a one-year period (01 October 2022 to 30 September 2023). DOSC were identified on the day that they occurred. The patient's family/legal guardian was directly contacted by the surgeon in pre-operative holding or via phone if they did not make it to the pre-operative setting to discuss the reason for cancellation and to appropriately reschedule surgery as indicated. Proper approval from the Institutional Review Board (IRB) of Wake Forest University was obtained prior to study initiation (No. 00025341). All demographic and applicable perioperative data were recorded via the patient's electronic medical record (EMR) on the date of cancellation.

All scheduled surgical cases across each pediatric urologist at this tertiary care center were included. Emergent add-ons and cases where patients were greater than 18 years old but were performed by a pediatric urologist were excluded from this analysis. Scheduled cases that were cancelled within 24 h but prior to the surgery date were also excluded.

Outcomes

The primary outcome for this analysis was the reason for cancellation. If the authors were able to contact the parent/legal guardian, the reason for cancellation was categorized as either avoidable or unavoidable.

Secondary outcomes were obtained using the EMR. Demographic data for cancelled patients, including patient age, gender, race/ethnicity, and distance lived in miles from the surgical site, were all recorded. The planned surgery and its indication were documented and classified as either major or minor procedures, defined as greater than or less than 60 min of planned operative time. The scheduled month and date of the surgery were recorded.

Data on surgical rescheduling, including the length of any delay from the day of cancellation to the day of rescheduled surgery, measured in days, were also collected. The total operating room time lost per canceled case, measured in minutes, was recorded.

Statistical analyses

Descriptive statistics were performed as indicated. Non-normal data were assumed for this analysis. For all continuous bivariate comparisons, a Mann-Whitney U test was used. For categorical comparisons, Chi-squared analyses were used unless an individual comparison group had an N of less than five, in which case a Fisher's exact test was used instead. IBM® SPSS® software version 30 was used. A p-value of less than 0.05 was used to indicate statistical significance.

Results

Demographic data

There were 2351 scheduled pediatric urology cases during the one-year study period. Of these, 51 (2.2%) were cancelled on the day of surgery (Table 1). All cancelled patients were male gender (100%), and the median patient age was 2 years (Interquartile Range [IQR] 8 months—8 years). When assessing race/ethnicity data, most cancelled patients identified as Black or African American (N = 18; 35.3%), White or Caucasian (N = 17; 33.3%), or Hispanic or Latino (N = 6; 11.8%). Six families (11.8%) indicated a need for translation services during all medical visits. The majority of cancelled patients (N = 32; 62.7%)

TABLE 1. **Demographic and surgical scheduling data of patients who had a day of surgery cancelled case within the study period**

Characteristic	Number (%) or median (IQR)
Age, years	2 (8 months to 8 years)
Gender	
Female	0 (0%)
Male	51 (100%)
Ethnicity	
Black or African American	18 (35.3%)
White or Caucasian	17 (33.3%)
Hispanic or Latino	6 (11.8%)
Asian	2 (3.9%)
Other	8 (15.7%)
Need for translation services	
Yes	6 (11.8%)
No	45 (88.2%)
Distance lived from the hospital, miles	22 (12-49)
Time of year for planned surgery	
Spring	14 (27.5%)
Summer	22 (43.1%)
Fall	7 (13.7%)
Winter	8 (15.7%)
Rescheduled surgery	
Yes	26 (51.0%)
No	25 (49.0%)
Delay to reschedule, days	38 (28–63)
Scheduled OR time lost, minutes	60 (40–300)

TABLE 2. **Planned surgery data of patients who had a day of surgery cancelled case within the study period**

Case		Case planned
Major Cases	Hypospadias Repair	3
	Laparoscopy with Orchiopexy	2
	Robotic Pyeloplasty	1
	Open Ureteroneocystostomy	1
Minor Cases	Circumcision	25
	Scrotal/Inguinal Orchiopexy	4
	Hernia/Hydrocele Repair	4
	Chordee Repair	4
	Penile Torsion Repair	3
	Buried Penis Repair	2
	Lysis of penile adhesions	1
	Meatoplasty	1

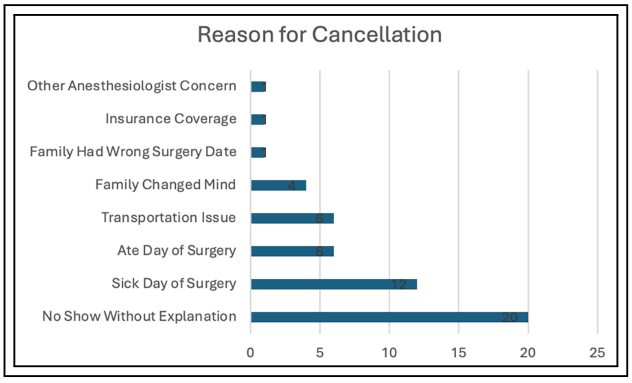

FIGURE 1. Recorded reason by patient/legal guardian for same-day surgical cancellation

lived within 30 miles of the planned surgical site, with a median distance travelled for surgery of 22 (IQR 12–49) miles. Summer was the most common time of year for cancellations (N = 22; 43.1%), followed by spring (N = 14; 27.5%). The majority (N = 44; 86.3%) were minor cases with penile surgery being most common (N = 39; 76.5%) followed by scrotal surgery (N = 8; 15.7%; Table 2).

Reason for cancellation

Twenty patients (39.2%) failed to show up on the day of surgery without any communication or explanation from their families or caregivers. Among the cancellations with a reported reason, 17 cases (54.9%) were attributed to avoidable causes (Figure 1). The most common avoidable reasons included eating on the day of surgery (N = 6; 35.3%), lack of arranged transportation (N = 6; 35.3%), and the family deciding not to proceed with surgery (N = 4; 23.5%). For cancellations deemed unavoidable (N = 45.2%), the most frequently reported reason was the patient being ill with a non-urologic condition on the day of surgery (N = 12; 85.7%).

When comparing avoidable and unavoidable reasons for cancellation, there were no statistically significant differences based on race ($p = 0.667$), distance from the surgical site ($p = 0.899$), or whether

the procedure was classified as major or minor ($p = 0.325$).

Surgical rescheduling and lost operating room time

Of same-day cancelled cases, 26 (51.0%) were rescheduled for a later date. The remaining patients either declined to proceed with surgery or were completely lost to follow-up. The median time to rescheduled surgery was a delay of 38 (IQR 28–63 days). Cancelled cases were booked for a median time of 60 min (IQR 40–300 min) of operating room time. A total of 3560 min (59.3 h or 7.4 eight-hour blocks) of operating room time were lost during this one-year study period. This included 300 min of robotic surgery block time.

Discussion

This analysis demonstrated 51 same-day cancellations prospectively identified out of 2351 cases in a one-year period, representing 2.2% of all planned pediatric urology cases. The literature regarding same-day cancellations varies across healthcare settings and the surgical specialty assessed. A 2013 Finnish study encompassing all pediatric surgical subspecialties reported a same-day cancellation rate of 4.5% among 12,205 scheduled surgeries.[11] When assessing specifically pediatric urology cases, authors identified a 2% cancellation rate,[11] which was similar to the present analysis. Another recent 2023 study assessing 1426 pediatric general surgery patients reported a 9.2% same-day cancellation rate, citing that 62.5% of cancellations were due to medical or anesthesia-related reasons.[3] In this analysis, the most common causes were upper respiratory tract infections (36.6%) and abnormal blood tests (16%).[3] Pediatric general surgery patients may represent a more medically complex patient population, which may contribute to a higher same-day cancellation rate compared to other specialties, with a higher percentage of elective cases in overall healthy patients.

In a 2018 retrospective review of 10,730 OR cases for a single Plastic Surgery division, the authors identified a 2.8% cancellation rate on the day of the procedure.[12] Similar to the findings reported in this present analysis, the 2018 study reported that although acute illness (44%) was the most common reason for cancellation, 42% of cancellations were considered preventable, highlighting opportunities for quality improvement within their institution.[12] Another study reported prospectively obtained findings at a tertiary medical center across 5929 planned elective surgical cases.[13] Authors identified that 4.4% were cancelled the day of surgery, with 71.6% deemed potentially avoidable.[13] In this current analysis, among patients with a documented reason for cancellation, the most common avoidable causes were eating on the day of surgery (35.3%), lack of arranged transportation (35.3%), and the family deciding not to proceed with surgery (23.5%). These issues highlight areas for improvement during the pre-operative counseling process, both in the clinic and through the nursing education phone call conducted the day before surgery.

The authors additionally identified that 67.7% of patients with same-day surgical cancellation during the study period identified as a minority race. Further, it was found that 11.8% of cancelled patients required translation services for all medical visits. These findings have been commented on throughout the literature.[14–16] In a 2015 assessment performed in Canada of same-day cancellations for pediatric MRI studies, authors reported a higher likelihood of socioeconomical causes for cancellation compared to medical causes, citing that distance lived from the hospital, and median income quintile of the neighborhood lived in were larger causes for cancellations than medical fitness.[14] Another recent 2025 study assessed clinic visit no-shows in a single hospital system within the Midwestern region of the United States.[15] Across 990,749 appointments, authors identified that no-shows were most common for patients who were younger in age ($p < 0.01$) and Black/African American (odds ratio 3.74).[15] Interestingly, another 2025 study had opposing findings. In a retrospective assessment of 26 patients who cancelled on the day of planned pediatric urology surgery in a Northwestern US setting, the authors reported no difference between those cancelled and not cancelled with regard to race, primary language spoken, or distance lived from the hospital.[16] Reasons for these differing findings are likely multifactorial, with a question of whether the geographic region plays a role. Regardless, these data collectively highlight the potential for vulnerability of select patient populations to the surgical healthcare system, specifically within the field of pediatric urology. Further data is critical to understanding and protecting these patient populations.

In this present analysis, the authors identified 3560 min (59.3 h) of operating room time lost, including 300 min of robotic block time lost, during this one-year study period. This equated to 7.4 eight-hour operative time blocks lost. Studies have reported that cancellations significantly impact healthcare costs,

with unproductive OR time in the US costing hospitals $1430 to $2025 per hour.[4] One study noted that, specifically at Cincinnati Children's Hospital Medical Center, lost OR time averaged 5.7 h daily, mainly due to patient illness, no-shows, and nil per os (NPO) violations.[6] Another 2022 study published in the Journal of Pediatric Urology described a system of electronic messaging (EM) implementation instead of the traditional nursing phone call with hopes to maximize family education and minimize preventable cancellations on the day of surgery.[17] Of 98 patients with EM and 212 who received a phone call, the authors found that patients who received EM demonstrated lower case cancellation rates, lower delay rates, and higher patient/family satisfaction.[17] This proposes a potential opportunity for providing information across multiple different sources that may be more accessible for individual families.

There are limitations to this study. All data was obtained from a single institution. This presents an opportunity for bias formed by the geographic region (southeastern United States) where the hospital is located and may not be generalizable to patient populations in other regions, including more rural or urban settings. Furthermore, 20 (39.2%) of families/caregivers cancelled without any communication or reason listed. It is impossible to understand their reason for cancellation, and this could alter data in terms of the true prevalence of avoidable versus unavoidable causes. Further, the authors did not include data regarding cancellations that happened the day prior to surgery, which still contributes to operating room time and revenue lost for surgeons, who find it difficult to fill on less than 24 h of notice. However, significant information is learned from this data in terms of areas that can be improved upon educationally, including NPO requirements, counseling on transportation options and requirements, and counseling on ensuring adequate time given if the family were to change their mind for etiquette to other patients and the provider's time.

This study additionally has several strengths. All data was obtained prospectively on the day that it occurred, with a goal to minimize recall bias when discussing causes for cancellations directly with the family/legal guardian. This data was additionally captured over an entire year period and across three different providers to maximize information obtained while minimizing time of year or provider-specific bias. This data provides important information to a patient population not well studied for this indication that can be utilized for quality improvement. Specific areas of improvement identified in this analysis included NPO education and counseling for vulnerable patient populations.

Conclusions

Same-day cancellations occurred in 2.2% of scheduled pediatric urology cases over a one-year period, with the majority attributed to avoidable causes. Among the canceled cases, only 51% were eventually rescheduled by the family, with a median delay of over one month. Additionally, two-thirds of the patients identified as belonging to a minority racial group, and 11.8% required translation services. These findings underscore the need for enhanced pre-operative counseling and support for vulnerable populations to improve both patient and provider outcomes.

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Author Contributions

Study Conception and Design: Tyler Overholt Daniel, Steve Hodges, Anthony Atala, Marc Colaco. Data Collection: Tyler Overholt Daniel, Randy Casals. Analysis and Interpretation of Results: Tyler Overholt Daniel, Marc Colaco. Draft Manuscript Preparation: Tyler Overholt Daniel, David Thole. All authors reviewed and approved the final version of the manuscript.

Availability of Data and Materials

Ancillary data not presented above in this manuscript is available upon request.

Ethics Approval

This study was approved by the Institutional Review Board (IRB) of Wake Forest University (No. 00025341). Informed consent has been obtained from the participants.

Conflicts of Interest

The authors declare no conflicts of interest.

Glossary

DOSC	Day-of-surgery cancellations
OR	Operating room
QI	Quality improvement
IRB	Institutional Review Board approval
EMR	Electronic Medical Record
IQR	Interquartile Range
NPO	Nil per os

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