# Patient Characteristics Associated with NPO Non-Compliance in the Pediatric Surgical Population

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## Introduction

- Surgical cancellations can decrease OR efficiency during peak hours, while increasing dissatisfaction among patients and providers.
- Nil per os (NPO) non-compliance remains one of the most common preventable causes of surgical cancellation.
- We sought to identify patient characteristics associated with NPO non-compliance requiring surgical cancellation.

## Methods

- A retrospective review of completed and cancelled pediatric procedures requiring the use of anesthesia was performed from 1/1/2015 to 12/31/2019. We excluded inpatients and emergency procedures.
- Data regarding patient demographics and surgical service were extracted from the electronic medical record.
- A logistic regression model was used to identify factors associated with cancellations due to NPO violations.

## Results

- Study cohort included 144,049 completed cases and 825 cancellations due to NPO non-compliance for an incidence of 0.57%.
- We observed significant differences by age, race, primary language, and insurance type in those who cancelled versus those who did not (Table 1).
- Age, race, primary language, insurance type, and type of surgical procedure were predictors of cancellation due to NPO (Table 2).

## Discussion

- Despite established NPO guidelines, NPO non-compliance remains a common reason for surgical cancellation.
- Our study showed distinct patient characteristics for increased risk of NPO violation requiring surgical cancellation.
- Future projects should focus on elucidating reason for NPO violations with targeted interventions based on feedback from families in order to improve patient satisfaction and operating room efficiency.

**Table 1.** Demographic characteristics

| | Not Cancelled N = 144,049 | Cancelled N = 825 | P |
|---|---|---|---|
| Variable | N (%) or Median (IQR) | | |
| Sex | | | 0.783 |
| Male | 79,979 (56%) | 462 (56%) | |
| Female | 64,070 (44%) | 363 (44%) | |
| Age (years) | 6 (3,11) | 6 (3, 8) | 0.050 |
| <1 | 3,343 (2%) | 16 (2%) | <0.001 |
| 1-2 | 26,735 (19%) | 136 (17%) | |
| 3-5 | 40,084 (28%) | 258 (31%) | |
| 6-9 | 32,277 (22%) | 238 (29%) | |
| 10-12 | 12,967 (9%) | 99 (12%) | |
| >13 | 28,643 (20%) | 78 (9%) | |
| Race | | | <0.001 |
| White | 102,522 (71%) | 347 (42%) | |
| Black or African American | 20,876 (14%) | 282 (34%) | |
| Other | 19,206 (13%) | 165 (20%) | |
| Not answered or Refused | 1,445 (1%) | 31 (4%) | |
| Language | | | <0.001 |
| English | 132,293 (92%) | 633 (77%) | |
| Spanish | 4,088 (3%) | 53 (6%) | |
| Somali | 2,730 (2%) | 51 (6%) | |
| Other | 4,938 (3%) | 70 (8%) | |
| Insurance | | | <0.001 |
| Private/Commercial | 66,265 (46%) | 120 (15%) | |
| Public | 71,929 (50%) | 632 (77%) | |
| Other | 5,855 (4%) | 55 (7%) | |

p-value calculated using chi-square test

**References**:
1. Dexter F, Marcon E, Epstein RH, Ledolter J: Validation of statistical methods to compare cancellation rates on the day of surgery. Anesth Analg 2005; 101:465–73
2. Boudreau SA, Gibson MJ. Surgical cancellations: a review of elective surgery cancellations in a tertiary care pediatric institution. J Perianesth Nurs. 2011 Oct;26(5):315-22

**Table 2.** Odds ratio (95% Confidence Intervals) for predictors of cancellation due to NPO

| Variable | Univariate Analysis | Multivariate Analysis |
|---|---|---|
| Sex | | |
| Male | Reference | Reference |
| Female | 1.02 (0.89, 1.17) | 0.99 (0.86 (1.14) |
| Age (years) | | |
| <1 | 0.74 (0.45, 1.23) | 0.90 (0.54, 1.52) |
| 1-2 | **0.79 (0.64, 0.97)** | 1.02 (0.82, 1.27) |
| 3-5 | Reference | Reference |
| 6-9 | 1.15 (0.96, 1.37) | **1.25 (1.05, 1.50)** |
| 10-12 | 1.19 (0.94, 1.50) | **1.63 (1.28, 2.07)** |
| >13 | **0.42 (0.33, 0.55)** | **0.68 (0.51, 0.89)** |
| Race | | |
| White | Reference | Reference |
| Black or African American | **3.99 (3.41, 4.67)** | **2.94 (2.47, 3.50)** |
| Other | **2.54 (2.11, 3.06)** | **1.68 (1.35, 2.10)** |
| Not answered or Refused | **6.34 (4.37, 9.19)** | **3.77 (2.55, 5.56)** |
| Language | | |
| English | Reference | Reference |
| Spanish | **2.64 (1.99, 3.49)** | **1.53 (1.09, 2.14)** |
| Somali | **3.80 (2.85, 5.06)** | 1.32 (0.97, 1.79) |
| Other | **2.88 (2.25, 3.69)** | **1.47 (1.13, 1.92)** |
| Insurance | | |
| Private/Commercial | Reference | Reference |
| Public | **4.22 (3.51, 5.07)** | **2.61 (2.14, 3.17)** |
| Other | **4.51 (3.30, 6.17)** | **3.20 (2.33, 4.40)** |
| Surgical Service | | |
| ENT | Reference | Reference |
| Radiology | **2.64 (2.13, 3.28)** | **3.02 (2.42, 3.76)** |
| Dental | **2.96 (2.41, 3.64)** | **2.19 (1.76, 2.72)** |
| Urology | **1.99 (1.47, 2.70)** | **1.95 (1.42, 2.66)** |
| Ophthalmology | 1.06 (0.72, 1.56) | 1.14 (0.77, 1.68) |
| Plastic Surgery | 1.06 (0.66, 1.72) | 1.21 (0.75, 1.97) |
| Pediatric Surgery | 0.83 (0.53, 1.29) | 0.91 (0.58, 1.41) |
| Orthopedics | 0.62 (0.38, 1.02) | 0.81 (0.49, 1.33) |
| Other | 0.93 (0.69, 1.23) | 1.24 (0.92, 1.67) |

Bold indicates p<0.05