

## HOSPITAL VARIATION IN MORTALITY AFTER INPATIENT PEDIATRIC SURGERY: DOES IT MATTER WHERE CHILDREN ARE TREATED?

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**Background:** Failure to rescue (FTR), or death after a postoperative complication, has been identified as a possible explanatory factor for hospital variation in perioperative mortality in specialized pediatric populations. However, the extent to which this may be case in more general pediatric surgery is unclear.

**Materials/Methods:** The Pediatric Health Information System® database (2012–2020) was used to identify patients who underwent one of 95 high-risk operations associated with significant perioperative mortality. Mortality, complication, and FTR rates were derived for each hospital. Hospitals were stratified into quintiles based on risk-adjusted inpatient mortality (very low mortality [quintile 1 (Q1)] to very high mortality [quintile 5 (Q5)]). Multivariable hierarchical regression was used to evaluate the association between hospital mortality quintile, complications, and FTR. Sensitivity analysis were performed for unique general surgical procedures.

**Results:** 201,880 patients were identified across 48 academic, pediatric hospitals. The mortality, complication, and FTR rates were 2.3%, 8.9%, and 8.8%, respectively. Hospital-level mortality rates significantly varied with a dose-response relationship (Q1, 2.08%; Q5, 2.78%; odds ratio (OR) 1.88, 95% confidence interval (CI) [1.69 – 2.08]). Among patients who died after surgery, 34.5% had a preceding complication. There was no significant difference in complication rates across hospitals (Q1, 9.1%; Q5, 8.9%; OR 1.04, 95% CI [0.89 – 1.21]). However, there was a significant dose-response relationship in FTR (Q1, 8.1%; Q5, 10.4%; OR 1.80, 95% CI [1.49 – 2.17]). This relationship was still appreciated when limited to specific procedures such as colectomy, gastrostomy tube, diaphragmatic hernia, gastroschisis, and tracheoesophageal fistula repair.

**Conclusions:** Variation in risk-adjusted mortality across academic, pediatric hospitals may be partially explained by differences in the recognition and management of postoperative complications. Additional work is needed to identify children at greatest risk of postoperative death from perioperative complications as opposed to those at risk from pre-existing chronic conditions.

**Images / Graph / Table**

Rates of Mortality, Complications, and Failure to Rescue according to Hospital Quintile of Mortality			
	Very Low Mortality Hospital Quintile	Very High Mortality Hospital Quintile	OR for Very High versus Very Low Mortality (95% CI)
Colecystomy, %			
Mortality	6.3	7.6	1.66 (1.26 – 2.17) <sup>a</sup>
Complications	25.0	21.7	0.84 (0.67 – 1.04)
Failure to rescue	9.5	11.9	1.58 (1.06 – 2.37) <sup>a</sup>
Gastrostomy tube, %			
Mortality	1.4	2.2	2.00 (1.44 – 2.78) <sup>a</sup>
Complications	12.9	12.4	1.10 (0.84 – 1.45)
Failure to rescue	4.6	7.6	2.09 (1.21 – 3.62) <sup>a</sup>
Congenital diaphragmatic hernia, %			
Mortality	3.3	9.7	6.41 (2.16 – 19.0) <sup>a</sup>
Complications	17.5	18.2	1.02 (0.59 – 1.85)
Failure to rescue	9.5	30.0	9.65 (1.24 – 75.21) <sup>a</sup>
Gastrocnidosis, %			
Mortality	3.3	8.9	2.17 (1.48 – 3.18) <sup>a</sup>
Complications	20.2	16.2	0.83 (0.63 – 1.09)
Failure to rescue	6.3	9.7	2.48 (1.32 – 4.66) <sup>a</sup>
Tracheoesophageal fistula, %			
Mortality	5.0	8.0	2.98 (1.51 – 5.87) <sup>a</sup>
Complications	21.2	20.1	1.06 (0.66 – 1.69)
Failure to rescue	6.2	17.9	7.18 (1.34 – 38.48) <sup>a</sup>
OR = Odds Ratio, CI = Confidence Interval			
<sup>a</sup> p < 0.05			