

The Association of Guideline Directed Prophylaxis with the Incidence of Postoperative Nausea and Vomiting in Pediatric Patients

Proposal for A Multicenter Retrospective Observational Cohort Study using the Multicenter Perioperative Outcomes Group (MPOG) Database

Title of Study	The Association of Guideline Directed Prophylaxis with the Incidence of Postoperative Nausea and Vomiting in Pediatric Patients: A Multicenter Retrospective Observational Cohort Study
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Statisticians	Benjamin Y. Andrew with support from Timothy T. Houle and Vijay Krishnamoorthy
Type of Study	Retrospective, observational
Data Source	MPOG database only
IRB Number	Duke University Health System IRB (Pro00112464) with Brad Taicher as PI
Aim	Primary aim: estimate the causal effect of compliance with guideline directed PONV prophylaxis (as defined by PONV-04) on the incidence of PONV (as defined by PONV-03) in pediatric patients undergoing general anesthesia.
Number of Patients	Data Direct query on 05/11/2023: range from 1,130,173 to 1,546,639 for cohorts with varying exclusions.
Power Analysis	In the setting of our proposed Bayesian outcome models we used a simulation based approach to estimate the effect of sample size on the precision of our estimates. See full text for details - assuming some further exclusion from 1.1 - 1.5 million patients the sample size will be more than sufficient to generate precise effect estimates under our modeling assumptions.
Statistical Approach	We will use a pseudo-Bayesian propensity score weighting approach whereby we first estimate a multilevel propensity score model and then use overlap and inverse probability of treatment weights generated from this model to estimate the effect of prophylaxis compliance using a Bayesian outcome model for PONV. See full text for modeling details and justification. Several sensitivity analyses are proposed, including alternative modeling approaches and alternative prior distribution specifications.
Resources	The primary author will be a clinical fellow in pediatric anesthesiology at Duke beginning August 1, 2023, with one day of dedicated non-clinical time per week.

Last updated: Wednesday, June 14, 2023

Replication materials for this proposal and project are available at: https://github.com/andrew10043/mpog_peds_ponv.