Enhancing tonsillectomy patient care using outcome-guided improvement cycles

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Goals

Tonsillectomies and adenoidectomies (T&A) are one of the most common procedures performed in children; however, there is scant published evidence to inform best practice

- Outcome-guided improvement cycles were used to refine and improve the anesthetic regimen for patients undergoing T&A in a free-standing pediatric ambulatory surgery center
- Using a consensus model, our group agreed on creating a standardized anesthetic as a starting point, then using Deming's Plan-Do-Check-Act (PDCA) cycle of improvement, measured patient outcomes and implemented serial improvement cycles
- Goals
  - Minimize or eliminate post-op pain and PONV in T&A patients
  - Not extending post anesthesia care unit (PACU) length of stay

Methods

In patients aged 3-10, anesthesia was induced and maintained with sevoflurane, air and oxygen. Propofol (1-2mg/kg) was used for airway instrumentation. All patients were extubated awake in the PACU. All patients received:

- Dexamethasone 0.15 mg/kg (max 4 mg)
- Ondansetron 0.15 mg/kg (max 4 mg)
- Lactated ringer 20ml/kg

All procedures analyzed were performed by a single surgeon to eliminate variability in surgical technique.

Methods

Three serial improvement cycles of standard practice were implemented over an average of 14 months (total n =978).
Clinical iteration 1 (**C1**): morphine 0.1mg/kg (n=439)
C2: fentanyl 2.5mcg/kg + IV acetaminophen 15mg/kg (n=273)
C3: morphine 0.1mg/kg + IV acetaminophen 15mg/kg (n=266)

Measured outcomes: max post-op pain score, morphine rescue rate in PACU, PACU length of stay and PONV rescue rate

Outcomes were retrospectively compared using QI Advisor (www.mdmetrix.com) which interrogates the clinical database to provide near-real time analysis. Shewhart control charts were created; first to demonstrate stable outcomes and then to look for special cause variation.

Results

PACU pain score, % with zero pain score

Table 1: Average max pain score for PACU stay: C1= 3.46, C2= 3.57, C3= 3.19. % Pts that achieved a zero pain score throughout the entire PACU stay: C1= 20.8%, C2= 25.9%, C3= 30.5%

Results continued

Rescue morphine

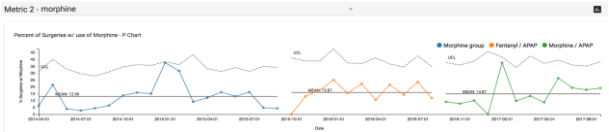

Table 2: % Needing rescue morphine C1= 13%, C2= 15.9%, C3= 14.9%

Rescue PONV medication

Table 3: PONV, defined as needing additional medication: C1 = 4.6%, C2 = 1.9%, C3 = 0.4%

C3 had lowest max pain score and highest % with a zero pain score. C3 had lowest additional PONV medication requirements. Length of stay (not shown) was unchanged for all groups (71 min, including awake extubation in PACU)

Discussion

These data suggest that morphine + IV acetaminophen (C3) resulted in lowest pain scores while maintaining the lowest requirements for rescue PONV medications without increasing PACU stay

Using outcome-guided improvement cycles of clinical standard work has allowed our group to safely evolve our anesthetic clinical work to improve care for our patients!