

**Title:** Accidental Extubation in Pediatric Patients under General Anesthesia: Frequency, Cofactor Predictors, and Sequellae

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**Introduction:** Accidental extubation (AE) is the unplanned external displacement of the endotracheal tube and the loss of the secured airway can lead to hypoxia and potentially any level of neurological injury or death. AE during cases with concurrent surgery in or around the face/mouth presents additional unique problems. Surgical packs and instrumentation may have to be removed for resuscitation access. Blood and/or excess oral secretions from the surgical procedure may fill the mouth and obscure the view of the larynx. Complete or incomplete surgical repairs may be disrupted. AE may occur during procedures where patient position seriously compromises favorable response and outcome; for example, procedures in prone position or in those with field avoidance.

The goals are to identify the incidence associated with AE under general anesthesia in pediatrics, identify cofactors that could predict this adverse event, and define the associated outcome (sequellae) that occur.

**Methods:**

This is a retrospective review of all AE occurring during a general anesthetic at the Children's Hospital of Pittsburgh (CHP) from April 1, 1988 thru June 30, 2005. This unanticipated anesthetic event is tracked within the Division of the Pediatric Anesthesiology CQI/QA system. The database system is a continuous longitudinal record of every anesthetic performed at CHP recording demographic, procedural, anesthetic data, and outcomes events. With > 224,000 pediatric anesthetic encounters and growth of ~19,500 cases/year, this system is the largest and most comprehensive database system in North America.

**Results:** 128 AE's were recorded.

Wt (mean) = 11.9kg, Range = 1.9-95kg, Age(mean) = 2.4 yr, Range = NB-19.8 yr

TTime (mean) 149 min, range 35-630 min {total anesthetic time}

Site(main) 128, Site(other) 0

Position: Supine 114, Prone 6, Lateral 6

ASA PS: PS1(1E) 45 (4), PS2(2E) 35(7), PS3(3E) 38(9), PS4(4E) 8(4)

% PS: PS1 0.04%, PS2 0.05%, PS3 0.13%, PS4 0.16%

Procedure Class

Rigid Esophagoscopy	13
Airway Exam (DLB)	12
Laparotomy	20
Ortho (exclude back)	12
Urology	5
Neurosurgery	10
T&A	2
Dental	5
Eye	6
Hernia	1
Ear	1
Spine	5

#### Cascading Outcome (Sequellae)

Oxygen Desaturation	47
Laryngospasm	25
Bronchospasm <sup>2</sup>	
Aspiration	2
Croup	4

**Discussion:** There is no published data on AE in the intra/perioperative period. Existing references from the ICU literature suggest that it is possible to reduce the incidence of this event as well as minimize cascading adverse sequellae. Pediatric patients do have a higher incidence of perioperative respiratory problems compared to adults (3).

Our frequency of AE of 0.057% (all cases) does not accurately define the actual incidence as our total included mask and LMA cases. Analysis will include only those patients that are intubated.

Recognition and prompt action are required to minimize cascading sequellae. Fortunately none of our patients had hypoxemia significant enough to cause either cardiac arrest or neurological injury. The data does define group(s) at higher risk. These include infants < 1yr of age, those having surgical procedures in/around the mouth including rigid esophagoscopy, cleft lip/palate, T&A and dental work. Additional factors include the patient's age (size). This adverse event occurs disproportionately higher in ASA 3/4 but ASA PS is a reflection of age (thus physical size) and procedure. The absence of AE at our "other" sites is related to case mix as well as the absence of trainees (both surgical and anesthesia).

#### References:

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