

# University of Iowa Stead Family Children's Hospital

## Clinical Practice Guideline

### - Monitoring for Apnea after General Anesthesia, Deep Sedation or Spinal Anesthesia in Young Infants -

---

#### **Objective**

This document was created by a multidisciplinary effort among the Departments of Anesthesia, Surgery and Pediatrics with the goal of providing condition / disease-specific care recommendations based on best available scientific evidence and/or consensus-based institutional recommendations. It is intended to decrease the complexity of medical decision making, reduce practice variation and improve the quality and safety of care by outlining the **mandatory admission for observation of a select group of young infants requiring general anesthesia, deep sedation or spinal anesthesia for either minor, elective surgery or non-invasive imaging studies**. Special care should be taken in considering treatment, as each patient has individual symptoms and treatment needs. Variation from this guideline may be appropriate so long as the rationale is documented.

#### **Definitions**

- **Infant:** patient  $\leq$  12 months of age
- **Apnea:** cessation of breathing for 15 seconds, with or without associated hypoxia and/or bradycardia
- **Postmenstrual age (PMA):** is equal to gestational age + chronological age
- **Preterm infant:** patient born at a gestational age of  $<$  37 completed weeks
- **Term infant:** patient born at a gestational age of  $\geq$  37 completed weeks

#### **Clinical Background**

Despite the known risk of apnea following general anesthesia, deep sedation or spinal anesthesia in infants, there is no current national standard of care for these patients. The current literature indicates that the risk of apnea following anesthesia is highest in the initial 22 hours following anesthetic exposure. Pediatric anesthesiologists uniformly consider deep sedation as an equivalent risk to general anesthesia. The use of spinal anesthesia has been shown to reduce with risk of apnea within 30 minutes of recovery but after that time, the risk of apnea is the same as if a general anesthetic had been administered. Therefore, this guideline is intended to apply to a select group of young infants who undergo deep sedation, general anesthesia or spinal anesthesia.

Infants identified to have a higher risk of apnea in following anesthetic exposure include those with a history of prematurity ( $<$  37 weeks gestational age at birth), anemia (Hematocrit  $<$  30), witnessed apneic event(s) at home prior to anesthesia / surgery or witnessed apnea in the PACU. In the presence of anemia, the risk of apnea is the same for both former premature and term infants. Patients with comorbid conditions involving respiratory or neurological systems also have an increased risk of apnea. Postmenstrual age is inversely related to the incidence of post-anesthesia apnea. Current literature suggests that the risk of post-anesthesia apnea remains  $\geq$  1% in former premature infants until a PMA of 60 weeks and in former term infants until a PMA of 48 – 54 weeks.

**INCLUSION CRITERIA:**

Former preterm infants who are < 60 weeks PMA or former term infants who are < 44 weeks PMA who undergo deep sedation / general anesthesia / spinal anesthesia for either minor, elective surgery or non-invasive imaging studies.

**EXCLUSION CRITERIA:**

Infants with significant comorbidities or who undergo a surgical procedure that would typically be admitted post-operatively.

**References**

1. Optimal resources for children's surgical care in the United States. *J Am Coll Surg*. 2014;218(3):479-87, 87.e1-4.
2. Cote CJ, Zaslavsky A, Downes JJ, Kurth CD, Welborn LG, Warner LO, et al. Postoperative apnea in former preterm infants after inguinal herniorrhaphy. A combined analysis. *Anesthesiology*. 1995;82(4):809-22.
3. Davidson AJ, Morton NS, Arnup SJ, de Graaff JC, Disma N, Withington DE, et al. Apnea after Awake Regional and General Anesthesia in Infants: The General Anesthesia Compared to Spinal Anesthesia Study--Comparing Apnea and Neurodevelopmental Outcomes, a Randomized Controlled Trial. *Anesthesiology*. 2015;123(1):38-54.
4. Coté CJ, Wilson S, AMERICAN ACADEMY OF PEDIATRICS, AMERICAN ACADEMY OF PEDIATRIC DENTISTRY. Guidelines for Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures: Update 2016. *Pediatrics*. 2016; 138(1):e20161212
5. Expert consensus from Department of Anesthesia Best Clinical Practice Committee.

Date Created: 12/13/2018

Effective Date: 12/13/2018

Date of Next Review: December 2021

**Related Policy**

University of Iowa Health Care – Anesthesia Dept: Mandatory Admission due to Postoperative Apnea Risk Following Sedation and Anesthesia for Infants

