

Pediatric Ambulatory Anesthesia

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KEYWORDS

- Upper respiratory infection • Apnea • Undiagnosed hypotonia • Anxiolysis
- Pregnancy testing • Remifentanyl • Circumcision • Acetaminophen

KEY POINTS

- Risk stratification is important to determine when it is safe to proceed with anesthesia in a child with current or recent upper respiratory infection.
- Patients at risk of apnea should be admitted for overnight monitoring; these include former premature infants younger than 55 to 60 weeks postconceptual age, full-term infants younger than 44 weeks postconceptual age who demonstrate any respiratory abnormalities, and certain children with sleep apnea who are recovering from tonsillectomy.
- In children with muscular dystrophy, the risk of hyperkalemic cardiac arrest after a brief exposure to volatile anesthetics seems low. Although children with mitochondrial disease have a variable response to anesthetic drugs; propofol infusion syndrome is not definitively linked to intraoperative propofol use.
- Dorsal penile nerve block and caudal block both work well for postcircumcision pain.
- A single loading dose of rectal acetaminophen for postoperative analgesia is best used with other drugs and when a delayed response is acceptable.

INTRODUCTION

Anesthetizing children for ambulatory surgery presents continuing challenges and many are reviewed elsewhere.¹⁻⁴ This update addresses several current issues in patient selection and preparation, and intraoperative and postoperative considerations for selected procedures, with an emphasis on pain management.

In 2006, approximately 3.3 million out of 53.3 million outpatient procedures were performed on patients younger than age 15, according to the Centers for Disease Control and Prevention's National Center for Health Statistics.⁵ The growth in volume over the decade occurred overwhelmingly in freestanding sites, with 43% of ambulatory procedures now being done in these settings. Ambulatory visits accounted for

Disclosure: Neither author is affiliated with companies that have a direct or competing financial interest in the material discussed in this article.

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Anesthesiology Clin 32 (2014) 411-429

<http://dx.doi.org/10.1016/j.anclin.2014.02.002>

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62% of visits or admissions in which a procedure was performed. Patients younger than age 15 have the lowest rates of ambulatory surgery, at 58 per 1000 for boys and 49 per 1000 for girls. Details of case statistics for pediatric patients are shown in [Table 1](#).

PATIENT SELECTION

Appropriate patient selection is critical to the success of outpatient surgery. Special areas of concern with children presenting for ambulatory anesthesia include upper respiratory tract infection (URI), apnea risk (among infants and those with sleep apnea), cardiac disease, and undiagnosed myopathy. The facility and expertise of available staff must also be considered in selecting younger or higher-risk children for outpatient surgery.

Upper Respiratory Infection

Children with URIs are at risk for perioperative respiratory adverse events (PRAEs) and risk stratification is crucial in deciding whether to postpone anesthesia. The approach to this dilemma has been refined over time. Initial reports emphasized the potentially severe consequences of anesthesia, including lung collapse, ICU admission, and even death.⁶ More recently, better evidence has allowed practitioners to exclude the children who are at highest risk, make appropriate clinical decisions, and proceed when children with less severe URI are undergoing minor procedures. This decision-making process may be facilitated by algorithms ([Fig. 1](#))⁶ and should include consideration of the following risk factors:

- **Patient factors:** Three issues to consider are symptom duration, illness severity, and the presence of underlying lung disease. In terms of symptom duration, a URI that is current or within the last 2 weeks is associated with a high PRAE risk.^{7,8} Waiting 4 weeks after a URI seems to provide an adequate clinical safety margin^{6,9} although laboratory studies suggest that airway reactivity may persist even longer. More severe symptoms (ie, copious purulent secretions, wet cough, high fever, and systemic findings such as lethargy and poor appetite) constitute higher PRAE risk. Such patients are often excluded from anesthetic outcome studies in children with URI.^{7,10–12} Finally, PRAEs are more likely in the presence of underlying respiratory problems such as asthma or prematurity-associated chronic lung disease.¹¹

Total ambulatory procedures (all ages)	53,329,000
Ambulatory procedures younger than 15 y	3,266,000
Case breakdown—patients younger than 15 y	
Myringotomy and tubes	667,000
Tonsillectomy with or without adenoidectomy	530,000
Orthopedic procedures	295,000
Operations on the male genital organs	166,000
Adenoidectomy	132,000
Hernia repair	73,000

Adapted from Centers for Disease Control and Prevention. National Survey of Ambulatory Surgery, 2006. Available at: <http://www.cdc.gov/nchs/nsas.htm>. Accessed January 30, 2014.

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