

**PEDIATRIC
OTOLARYNGOLOGY-
HEAD & NECK
SURGERY**

CLINICAL REFERENCE GUIDE

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FOREWORD

Pediatric Otolaryngology-Head and Neck Surgery: A Clinical Reference Guide is a valuable new educational resource for residents and fellows in training who desire a comprehensive and concise source of information with respect to the discipline of pediatric otolaryngology. The guide also fills a necessary niche in terms of providing an informative text designed for the rapidly expanding group of physician extenders—physician assistants, nurses, and nurse practitioners—providing pediatric otolaryngologic care.

The guide's 69 chapters are divided into 7 sections. Four sections cover the major subspecialty fields of otology, rhinology, laryngology, and bronchoesophagology, and head and neck surgery. Two sections—embryology and common syndromes—are critical to the pediatric otolaryngology focus of the text. The section on Evidence-Based Guidelines in Pediatric Otolaryngology is unique and reflects the current emphasis on clinical outcomes throughout Otolaryngology-Head and Neck Surgery.

The editor, Dr. Sanjay Parikh, and his section editors—Drs. Emily Boss, Steven Goudy, Paul Krakovitz, Soham Roy, David White, and Carlton Zdanski—are among the up and coming leaders in the field of pediatric otolaryngology. The authors of many of the chapters are similarly of the most recent decade of pediatric otolaryngologists, representing over 30 well-respected institutions. As such, they bring a fresh perspective to longstanding topics, introducing innovative diagnostic techniques and novel therapeutic interventions.

The guide's overall concept of enlisting young authors with senior mentorship, coupled with a textbook of manageable size, provides for an excellent contemporary review to guide current and future generations of otolaryngologists in the care of infants, children, and adolescents.

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SECTION



**Evidence and Guidelines in
Pediatric Otolaryngology**

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CHAPTER

64

Evidence and Guidelines: Tympanostomy Tubes

David E. Tunkel

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INTRODUCTION

- Tympanostomy tube insertion is the most common ambulatory surgical procedure in children in the U.S.
- By age 3 years almost 7% of children will have tympanostomy tubes
- 667,000 children <15 yrs old undergo tympanostomy tube placement yearly
- Most common indications for tubes are otitis media with effusion and recurrent acute otitis media (most evidence and guidelines are for these diagnoses)
- Less common indications for tympanostomy tubes include complications of otitis media, structural changes of the tympanic membranes (eg, atelectasis), and barotrauma—limited knowledge exists to make evidence-based recommendations for these indications
- Although tympanostomy tube placement is common, controversies and differences of opinion remain about:
 1. Appropriate indications for tympanostomy tubes
 2. Possible overuse of tubes for recurrent acute otitis media or middle ear effusions of short duration
 3. Appropriate perioperative care and long-term follow-up

Indications for Surgery

Acute Otitis Media

- Tympanostomy tubes do not have a role in treatment of uncomplicated isolated acute otitis media
- Tympanostomy tubes can be placed at the time of myringotomy for children with complications of acute otitis media (facial nerve paralysis, mastoiditis, lateral sinus thrombosis, etc). Although no RCTs support this recommendation, surgical drainage of middle ear space is useful adjunct to medical therapy, and allows culture to direct medical therapy

Recurrent Acute Otitis Media

- Usually defined as 3 episodes in 6 months, or 4 episodes of otitis media occurring over a year with 1 episode within 6 months of presentation
- Prior to 2013 few if any evidence-based guidelines recommended tympanostomy tubes for recurrent acute otitis media (includes U.S., Japan, Italy, others)
- AAP Clinical Practice Guideline on Acute Otitis Media published March 2013 contained an action statement that says clinicians

- may offer tympanostomy tubes for recurrent acute otitis media¹ (Considered an “option” as supporting literature is scant)
- Cochrane review included only 2 studies which met inclusion criteria, and found tympanostomy tubes reduced the number of acute otitis media episodes by 1.5 in the first 6 months after surgery; long-term benefits of tubes have not been demonstrated²
 - One systematic review found insufficient evidence that tympanostomy tubes had a beneficial effect for recurrent acute otitis media³
 - Another systematic review found tympanostomy tube efficacy for reduction of recurrent acute otitis media similar to antibiotic prophylaxis, with the reduction of 1 episode of acute otitis media in the 6 months following surgery. Estimated number needed to treat to prevent 1 episode of acute otitis media was between 2 and 5⁴
 - Large quality-of-life improvements have been demonstrated after placement of tympanostomy tubes, but these studies usually included mixed populations of children with acute otitis media, middle ear effusions, or both
 - **AAOHNS Clinical Practice Guideline on Tympanostomy Tubes** (Table 64–1) published July 2013 makes several recommendations about the use of tympanostomy tubes for recurrent acute otitis media:⁵
 1. Clinicians should NOT perform tympanostomy tube insertion in children with a history of recurrent acute otitis media who do not have a middle ear effusion in at least 1 ear at the time of evaluation:
 - a. The children in the control groups of antibiotic prophylaxis trials for prevention of acute otitis media had no middle ear effusions on entry to the trial and had very favorable natural history, with most children experiencing less than 2 infections in the study period
 - b. Children with a history of recurrent acute otitis media and a normal examination at presentation may be “overdiagnosed”
 2. Clinicians SHOULD offer tympanostomy tube insertion in children with history of recurrent acute otitis media who have middle ear effusion in 1 or both ears at the time of evaluation
 - a. Trials that did not exclude children with middle ear effusion suggest a modest reduction in number of episodes of acute otitis media after tympanostomy tubes
 - b. Although reduction of episodes of acute otitis media is the primary goal, tympanostomy tubes may reduce pain during episodes of acute otitis media and can allow treatment of otorrhea with ototopical antibiotics

TABLE 64–1. Key Action Statements from *Aaobns Clinical Practice Guideline: Tympanostomy Tubes in Children (2013)*

| Topic | Action Statement | Directive |
|---|---|------------------------|
| OME of short duration | Clinicians should not perform tympanostomy tube insertion in children with a single episode of OME of less than 3 months duration, from the date of onset (if known) or from the date of diagnosis (if onset is unknown) | Recommendation against |
| Hearing testing | Clinicians should obtain an age-appropriate hearing test if OME persists for 3 months or longer OR prior to surgery when a child becomes a candidate for tympanostomy tube insertion | Recommendation |
| Chronic bilateral OME with hearing difficulty | Clinicians should offer bilateral tympanostomy tube insertion to children with bilateral OME for 3 months or longer AND documented hearing difficulties | Recommendation |
| Chronic OME with symptoms | Clinicians may perform tympanostomy tube insertion in children with unilateral or bilateral OME for 3 months or longer AND symptoms that are likely attributable to OME that include, but are not limited to, balance problems, poor school performance, behavioral problems, ear discomfort, or reduced quality of life | Option |
| Surveillance of chronic OME | Clinicians should re-evaluate, at 3–6 month intervals, children with chronic OME who do not receive tympanostomy tubes, until the effusion is no longer present, significant hearing loss is detected, or structural abnormalities of the tympanic membrane or middle ear are suspected | Recommendation |
| Recurrent AOM without MEE | Clinicians should not perform tympanostomy tube insertion in children with recurrent acute otitis media who do not have middle ear effusion in either ear at the time of assessment for tube candidacy | Recommendation against |

| | | |
|---|--|------------------------|
| Recurrent AOM with MEE | Clinicians should offer bilateral tympanostomy tube insertion in children with recurrent AOM who have unilateral or bilateral MEE at the time of assessment for tube candidacy | Recommendation |
| At-risk children | Clinicians should determine if a child with recurrent AOM or with OME of any duration is at increased risk for speech, language, or learning problems from otitis media because of baseline sensory, physical, cognitive, or behavioral factors | Recommendation |
| Tympanostomy tubes and at-risk children | Clinicians may perform tympanostomy tube insertion in at-risk children with unilateral or bilateral OME that is unlikely to resolve quickly as reflected by a type B tympanogram or persistence of effusion for 3 months or longer | Option |
| Perioperative education | In the perioperative period, clinicians should educate caregivers of children with tympanostomy tubes regarding the expected duration of tube function, recommended follow-up schedule, and detection of complications | Recommendation |
| Acute tympanostomy tube otorrhea | Clinicians should prescribe topical antibiotic ear drops only, without oral antibiotics, for children with uncomplicated acute tympanostomy tube otorrhea | Strong recommendation |
| Water precautions | Clinicians should not encourage routine prophylactic water precautions for children with tympanostomy tubes | Recommendation against |

Source: Rosenfeld RM, Schwartz SR, Pynnonen MA, et al. Clinical practice guideline: tympanostomy tubes in children. *Otolaryngol Head Neck Surg*. 2013;149(suppl 1):S1–35.