Cook Children's Medical Center
Clinical Excellence Committee

Evidence-Based Algorithm for Referral to Otolaryngology for Tympanostomy Tube Placement

Goals:

-To provide recommendations to Primary Care Physicians regarding referral to ENT for possible tympanostomy tube placement in patients with acute otitis media.

Inclusion Criteria:

-Children ages 6 months – 12 years old.

Exclusions Criteria:

-Children younger than 6 months or older than 12 years

Background:

Myringotomy and tympanostomy tube placement is the most common pediatric ambulatory surgery performed in the United States [1]. An earlier study found that approximately 7% of children in the US have had tympanostomy tubes placed by age 3[2]. Another study has found that of those children who have had tympanostomy tubes placed, 20% required a second set of tubes [3]. This guideline seeks to incorporate the most recent clinical practice guidelines and research to provide recommendations to providers treating acute otitis media in the outpatient setting for when placement of tympanostomy tubes should be considered.

Definitions:

Chronic Otitis Media – Otitis media with effusion that has persisted for more than 3 months from the date of onset or the date of diagnosis (if date of onset is unknown)

Otitis Media with Effusion – The presence of fluid in the middle ear in the absence of an acute ear infection

Recurrent Acute Otitis Media – more than 3 distinct episodes of AOM in the last 6 months or 4 distinct episodes of AOM in the last 12 months with at least one episode in the last 6 months.

Recommendations:

1) **Referral to Otolaryngology for possible tympanostomy tube placement should be considered in otherwise normal children who have Chronic Otitis Media with Effusion > 3 months from time of onset or time of diagnosis (if time of onset is unknown) <u>AND AT LEAST ONE</u> of the following criteria, if it is likely attributed to the otitis media with effusion [4].**
    - **-Concerns for hearing loss**
    - **-Balance problems**
    - **-Poor school performance**
    - **-Behavioral problems**

-Ear discomfort
-Reduced quality of life
-Other problems not listed above, but likely caused by the otitis media with effusion

Otitis media with effusion and no signs of acute infection is likely to resolve spontaneously, which is why ENT referral should not be considered until it has persisted for greater than 3 months, as approximately 90% of effusions associated with acute otitis media have resolved by that time [5]. While the chance of spontaneous resolution decreases significantly after 3 months, it may still occur, which is why surgical intervention is only recommended if the otherwise normal child is having complications from their effusion. For those effusions observed past the initial 3 months, 20% will resolve after an additional 3 months and 25% after an additional six months [6].

2) **Those children with chronic otitis media who are asymptomatic and do not meet criteria for tympanostomy tube placement should be re-evaluated every 3-6 months until their middle ear effusion resolves or they meet above criteria for tympanostomy tube placement. If clinicians suspect structural changes of the tympanic membrane or middle ear, referral should be made to ENT for possible tympanostomy tube placement [4].**

3) **Clinicians SHOULD NOT refer otherwise normal children with recurrent Acute Otitis Media who DO NOT have prolonged middle ear effusions to Otolaryngology for tympanostomy tube placement [4]. A prolonged middle ear effusion is defined as an effusion that lasts longer than 3 months. It is important to note that those children who are considered at-risk should be referred to ENT for consideration of tympanostomy tubes if they experience recurrent acute otitis media, as detailed in recommendation #5 below.**

   It is important to note the difference between the 2013 American Academy of Pediatrics guidelines and the 2013 American Academy of Otolaryngology-Head and Neck Surgery guidelines. The AAP guidelines state clinicians *may* offer referral to ENT if patients have had recurrent AOM [7]. The AAP guidelines concede that the use of tympanostomy tubes for recurrent AOM is controversial with a lack of consensus among otolaryngologists and that research in this area is scant. The AAO guidelines recommend against tympanostomy tube place in this situation because of a favorable natural history for recurrent AOM that improves as children age [6].

4) **Clinicians SHOULD refer patients with recurrent Acute Otitis Media who DO have prolonged middle ear effusions to Otolaryngology for possible tympanostomy tube placement [4]. A prolonged middle ear effusion is defined as an effusion that lasts longer than 3 months.**

   The presence of a prolonged middle ear effusion indicates underlying eustachian tube dysfunction that may predispose a patient to further episodes of AOM [4].

5) **<u>At-risk children</u> should be referred to Otolaryngology for possible tympanostomy tube placement if they have recurrent Acute Otitis Media with or without effusion, Otitis Media with Effusion that has a Type B (flat) tympanogram or Chronic Otitis Media with Effusion > 3 months [4].**

   At risk children are defined as those with conditions that place them at greater risk for eustachian tube dysfunction, those who are immunocompromised, those who have history of significant complications from AOM or those who may be less able to tolerate a mild decrease in hearing. As an example, a child with normal baseline hearing may tolerate a 15-20 dB hearing decrease but a child who already has some degree of permanent hearing loss may see a substantial deterioration in their quality of life from further hearing decreases [4].

   A middle ear effusion that has a Type B (flat) pattern on tympanogram is one that is unlikely to resolve quickly [4].

   While this list is not exhaustive, examples of at-risk children include those who are immunosuppressed, those who have had mastoiditis or meningitis associated with AOM, those with significant antibiotic allergies or those with developmental problems, sensory problems, behavioral problems, vision problems/blindness, speech delays, autism, cleft palate, craniofacial abnormalities or Trisomy 21.

References

1. Steele, D.W., et al., *Effectiveness of Tympanostomy Tubes for Otitis Media: A Meta-analysis.* Pediatrics, 2017. **139**(6).
2. Kogan, M.D., et al., *Factors associated with tympanostomy tube insertion among preschool-aged children in the United States.* Am J Public Health, 2000. **90**(2): p. 245-50.
3. Boston, M., et al., *Incidence of and risk factors for additional tympanostomy tube insertion in children.* Arch Otolaryngol Head Neck Surg, 2003. **129**(3): p. 293-6.
4. Rosenfeld, R.M., et al., *Clinical practice guideline: Tympanostomy tubes in children.* Otolaryngol Head Neck Surg, 2013. **149**(1 Suppl): p. S1-35.
5. Teele, D.W., J.O. Klein, and B.A. Rosner, *Epidemiology of otitis media in children.* Ann Otol Rhinol Laryngol Suppl, 1980. **89**(3 Pt 2): p. 5-6.
6. Rosenfeld, R.M. and D. Kay, *Natural history of untreated otitis media.* Laryngoscope, 2003. **113**(10): p. 1645-57.
7. Lieberthal, A.S., et al., *The diagnosis and management of acute otitis media.* Pediatrics, 2013. **131**(3): p. e964-99.

This guideline is intended to assist providers in decision making by providing the current state of evidence and recommendations. This guideline is not meant to replace clinical judgement and will not be appropriate for all patients.

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