



Evidence Based Clinical Practice Guideline

## For medical management of Otitis Media with Effusion in children 2 months to 13 years of age

Original Publication Date: March, 1999

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### Target Population

**Inclusion:** Intended primarily for use in:

- Children age 2 months up to 13 years of age who present with signs and symptoms of otitis media with effusion.

**Exclusion:**

- Children with functioning pressure equalization (PE) tubes in place.

### Target Users

Includes but is not limited to (in alphabetical order):

- Attending physicians
- Audiologists
- Community physicians and practitioners
- Otolaryngologists<sup>a</sup>
- Patient / family
- Patient care staff
- Residents
- Speech pathologists

### Introduction

References in parentheses ( ) Evidence strengths in [ ] (See last page for [definitions](#))

Otitis media with effusion (OME) is defined as the presence of fluid in the middle ear without signs or symptoms of [acute otitis media \(AOM\)](#) (AAP 2004b [S]). See [Table 1](#) for definitions and abbreviations of otitis media used in this guideline, and the [Appendix](#) for a drawing of the middle ear and definitions and common names useful for patient / family education purposes.

<sup>a</sup> Otolaryngologist = ENT, ear/nose/throat physician

Otitis media (OM) is one of the most common reasons for visits to the primary care physician, particularly for the young child, though decreasing trends for visit rates have been observed through the 1990s (McCraig 2002 [O]). About 2.2 million diagnosed episodes of OME occur annually in the United States, yielding a combined direct and indirect annual cost estimate of \$4.0 billion (AAP 2004b [S], Shekelle 2003 [S]). Rate of tympanostomy tube placement has been reported at 1.8% of infants in the first year of life and 4.2% of infants in the second year of life (Paradise 1997 [C]).

About 90% of children and 80% of individual ears have OME at some time before they reach school age (Tos 1984 [C]). Prevalence of OME is higher in the winter and lower in the summer. Many episodes of OME spontaneously improve within 3 months (Williamson 1994 [C], Tos 1984 [C]) with resolution more likely in summer than in winter (Gordon 2004 [C]).

OME results either as a consequence to an episode of AOM which is slow to clear, or spontaneously from poor functioning of the eustachian tube (AAP 2004b [S]). Children at risk for the latter of these two include those with craniofacial anomalies, such as cleft palate or Down syndrome. The presence of OME is of clinical concern because it decreases the mobility of the tympanic membrane causing hearing impairment. This temporary hearing loss may contribute to speech and/or language delay or other developmental delays.

The challenges presented in the management of OME partially result from insufficient high quality evidence. Studies often exclude high risk children, fail to control for therapeutic interventions, inadequately distinguish persistent versus recurrent OME and enroll few children less than 3 years of age (Shekelle 2003 [S]). In addition, few studies exist on the effects of modifying risk factors (MRC Multicentre Otitis Media Study Group 2001 [C]).

Insufficient evidence exists to draw conclusions about the role that persistent OME plays in children under age 3 years in cognitive or behavioral outcomes, and more studies are needed to examine this and other risk factors likely to confound these data.

In the target population, the objectives of this guideline are to:

- improve the identification of the at risk child,
- improve the use of appropriate referral criteria, and
- improve parental involvement in decision-making around the management of OME.

**Table 1 Abbreviations and Definitions of Types of Otitis**

| Otitis Type                                   | Definition   | Comment   |
|---|--|---|
| <b>MEE (middle ear effusion)</b>              | Any fluid in middle ear space regardless of cause.   | Assess presence by pneumatic otoscopy or tympanometry.  |
| <b>Myringitis</b>                             | Erythema of tympanic membrane (TM) without MEE (may be mimicked by crying).  | Most often viral. Does not respond to antibiotics. May be seen in early AOM or during resolution.   |
| <b>AOM (acute otitis media)</b>               | MEE with rapid onset of one or more of the following: otalgia, ear pulling, otorrhea, fever, irritability, anorexia, vomiting, or other symptoms.                  | Most frequent diagnosis by pediatricians: 48% of children by age 6 months, 79% by age 1 year and 90% by age 2 years ( <i>Paradise 1997 [C]</i> ). |
| <b>Sporadic AOM</b>                           | AOM occurring more than 3 months after a prior episode of AOM.   | Compare to recurrent AOM.   |
| <b>Recurrent AOM (otitis-prone condition)</b> | History of 6 episodes over a 12 month period, taking into account the severity of episodes, clustering of episodes, and persistence of otitis media with effusion. | Affects about 15-30% of children.   |
| <b>OME (otitis media with effusion)</b>       | MEE without signs or symptoms of infection.  | Childhood prevalence of about 15%. Often follows AOM.   |
| <b>Chronic OME</b>                            | OME with duration more than 3 months.  |   |

*Modified and adapted from: (Rosenfeld 1996 [S])*

## Guideline Recommendations

### Assessment and Diagnosis

#### General

Signs and symptoms of OME are often only identified upon follow-up to AOM or at an unrelated office visit.

#### History and Physical Examination

- It is recommended that a focused history and physical of the child with OME includes assessment and documentation of:
  - intermittent ear pain, fullness, or popping,
  - hearing/speech concerns (*Roberts 2004 [M]*),
  - balance (*Golz 1998 [C]*, *Casselbrant 1995 [C]*),
  - bilaterality,
  - duration of effusion,
  - recurrent AOM, and
  - presence of any craniofacial anomalies (*AAP 2004b [S]*).
- It is recommended that OME be diagnosed by the presence of middle ear effusion, as assessed by pneumatic otoscopy, without signs and symptoms of acute inflammation (*AAP 2004b [S]*).

**Note:** Adequate illumination for OME diagnosis requires appropriate maintenance of pneumatic otoscopes in the office, including changing the light bulb and battery (*Barriga 1986 [O]*).

- It is recommended that tympanometry may be used to enhance accuracy when diagnosing OME (*Karma*

*1989 [D]*, *Shekelle 2003 [S]*, *Brookhouser 1998 [S]*, *Jones 2003 [O]*, *Pichichero 2002 [O]*, *Pichichero 2001 [O]*).

**Note 1:** Pneumatic otoscopy and tympanometry measure the degree of mobility of tympanic membrane as an indication of the presence of middle ear effusion (MEE) (*Palmu 1999 [C]*, *van Balen 1999 [C]*, *Jerger 1970 [C]*, *Jones 2003 [O]*, *Pichichero 2002 [O]*, *Barriga 1986 [O]*).

**Note 2:** Acoustic reflectometry is not often used nor readily available in the Cincinnati area, though the procedure is acceptable for determining the presence of MEE (*Block 1999 [C]*, *Barnett 1998 [C]*, *Block 1998 [C]*, *Kimball 1998 [S]*).

**Table 2 Risk Factors for Developmental Difficulties**

|   |
|---|
| <ul style="list-style-type: none"> <li>Permanent hearing loss independent of OME</li> <li>Suspected or diagnosed speech and language delay or disorder</li> <li>Autism-spectrum disorder and other pervasive developmental disorders</li> <li>Syndromes (e.g. Down) or craniofacial disorders that include cognitive, speech, and language delays</li> <li>Blindness or uncorrectable visual impairment</li> <li>Cleft palate with or without associated syndrome</li> <li>Developmental delay</li> </ul> |
|---|

(*AAP 2004b [S]*)

- It is recommended that the child with OME who is at risk for developmental difficulties be identified early. These children include those with sensory, physical, cognitive or behavioral factors listed in [Table 2](#) (*AAP 2004b [S]*).

**Note:** Children with Down syndrome (*Shott 2001 [C]*, *Whiteman 1986 [C]*), cranial facial dysostosis

(Corey 1987 [C]), cleft palate (Paradise 1974 [C]) and autism (Rosenhall 1999 [C]) have been shown to be at higher risk for OME and/or its associated outcomes of developmental delay in hearing, speech or language.

## **Management**

The foundation of OME management is follow-up and monitoring of the presence or resolution of effusion. This monitoring is clinically important for the early identification of the child at risk for developmental difficulties and for the appropriate timing for referral of the child with persistent OME.

1. It is recommended that observation without antibiotics be the first line management option for at least 3 months for the child with OME (AAP 2004b [S]).

**Note:** Data on spontaneous resolution rates in the literature are extremely variable, but generally range from 20-80% by 3 months. Inclusion criteria, resolution criteria, duration at diagnosis, month of diagnosis and transient improvement followed by relapse contribute to the reported variability (Rosenfeld 2003 [M]).

2. It is recommended that all children with OME who have a positive assessment for pain be treated with an appropriate analgesic, though ear pain in OME is not common (AAP 2004a [S], AAP 2001 [S]).
3. It is recommended, for the otherwise healthy child with persistent OME, that no medication be given (Williamson 2002 [S]).

**Note 1:** Meta-analyses reviewing the benefit of antibiotics for persistent OME have been equivocal. One review published prior to current concern for judicious use of antibiotics found short-term benefit (Rosenfeld 1992 [M]). A more recent review raised questions about selection bias and concluded studies do not support the use of antibiotics for OME (Cantekin 1998 [M]).

**Note 2:** A small RCT<sup>b</sup> demonstrated more rapid improvement in a nasal beclomethasone intervention group as compared to controls over a 12 week treatment period. Both groups were treated with antibiotics (Tracy 1998 [B]).

**Note 3:** Two weeks of systemic steroid therapy demonstrated better resolution of effusion at the end of therapy as compared to a control group ( $p=.03$ ). However, two weeks after finishing

treatment there was no difference between groups ( $p=.12$ ) (Mandel 2002 [A]).

4. It is recommended that the child with OME who is at risk for developmental difficulties (see [Table 2](#)) be aggressively managed as appropriate to his/her condition. This individualized management may include:

- earlier referral for audiologic evaluation (Friel-Patti 1990 [C], Carney 1998 [S]),
- shorter intervals between visits,
- antibiotic therapy,
- referral for speech/language assessment,
- referral for PE tubes, and/or
- referral for other otolaryngological evaluation.

**Note 1:** A 5-year study of 48 children with Down syndrome found that the previously reported incidence of 38%-78% hearing loss in children with Down syndrome can be reduced to 3% with aggressive management of OM (Shott 2001 [C]).

**Note 2:** Preventive strategies may be helpful to children from special populations, from poor socioeconomic environments, or with development delays who are at risk for language and learning delay and who are experiencing hearing loss due to OME (Roberts 2003 [M], Roberts 2002 [C], Roberts 1998 [C], Roberts 1995 [C]). See [Table 3](#).

**Table 3 Strategies for optimizing the listening- learning environment for children with OME and hearing loss**

- Get within 3 feet of the child before speaking.
- Turn off competing audio signals such as unnecessary music and television in the background.
- Face the child and speak clearly, using visual clues (hands, pictures) in addition to speech.
- Slow the rate, raise the level, and enunciate speech directed at the child.
- Read to or with the child, explaining pictures and asking questions.
- Repeat words, phrases, and questions when misunderstood.
- Assign preferential seating in the classroom near the teacher.
- Use a frequency-modulated (FM) personal- or sound-field amplification system in the classroom.

(Roberts 2004 [M], AAP 2004b [S])

5. It is recommended that the otherwise healthy child with OME be evaluated at 1-2 months after diagnosis and then again at 3 months after diagnosis, or until either spontaneous, medical, or surgical resolution of the effusion is achieved or until basis for a referral is identified (see [Consults and](#)

<sup>b</sup> RCT = randomized controlled trial

[Referrals](#) section) (*Paradise 2003a [A], Paradise 2003b [A], Paradise 2001 [A], AAP 2004b [S], Paradise 2002 [X]*).

6. It is **not** recommended that other therapies be used in the treatment of OME.

Systemic steroids, antihistamines, decongestants, and complementary or alternative treatments have not been documented to be efficacious in the treatment of OME, and some herbal preparations may have harmful side effects (*Ernst 2003 [M], Mandel 1987 [A], Harrison 1999 [B], Fallon 1997 [C], Williamson 2002 [S], Miller 2000 [S]*).

**Note:** It is recognized that use of complementary and alternative medicine (CAM) is common and its use is often not reported to the primary care physician (*Eisenberg 1998 [O], Spigelblatt 1994 [O]*). The physician may take the OME visit as an opportunity to begin a respectful discussion regarding the safety and efficacy of CAM with families who report its use<sup>c</sup>.

## **Consults and Referrals**

Evaluation for placement of pressure-equalizing (PE) tubes is the most common reason children with OME are referred to an otolaryngologist. The discussion of alternatives, risks, benefits, and expected outcomes associated with tube placement begins with the primary care clinician and is continued with the otolaryngologist if the patient is referred.

Re-establishing ventilation to the middle ear by tube placement may be helpful for the following reasons:

- to decrease the frequency of recurrent AOM for families burdened by repeated infections or in cases affected by antibiotic resistance,
- to maximize hearing potential for children at risk for poor school performance, behavior problems, or speech/language delay,
- to prevent chronic changes to the TM or to the middle ear space,
- to prevent or treat acute complications of AOM.

Delaying insertion of tube placement will allow many cases to resolve spontaneously and may be elected for the following reasons:

- to delay or avoid surgery and anesthesia,
- to decrease risk of TM abnormalities caused by surgery,
- to reduce unnecessary use of resources.

**Table 4 Hearing Loss Definitions and Expected Auditory Behaviors in Children with OME**

| Level of Hearing Loss   | Hearing Levels (dB) |
|---|---------------------|
| <u>Moderate</u>   | ≥ 40                |
| <ul style="list-style-type: none"> <li>• communication, learning and socialization significantly affected</li> <li>• understands conversational speech only within a distance of 3-5 ft (face-to-face)</li> </ul>           |                     |
| <u>Mild</u>   | 26 – 39             |
| <ul style="list-style-type: none"> <li>• has difficulty with selective hearing and background noise</li> <li>• has significant difficulty with faint or distant speakers</li> <li>• may mimic attention problems</li> </ul> |                     |
| <u>Normal to Slight</u>   | ≤ 25                |
| <ul style="list-style-type: none"> <li>• may exhibit fatigue due to listening effort</li> <li>• may have difficulty with faint or distant speakers</li> </ul>   |                     |

Adapted from (*Martin 1996 [S], Anderson 1991 [S]*)

1. It is recommended that a child be referred for audiologic evaluation (see [Table 4](#)):
  - if OME persists for at least 3 months,
  - if concerns are noted for hearing, speech or language, by parents, teachers, or healthcare providers, or
  - 3 months after a prior audiologic evaluation in a child being observed with OME

(*Johnston 2004 [A], Brody 1999 [C], Rosenfeld 1998 [C], AAP 2004b [S], Local Expert Consensus [E]*).
2. It is recommended that an introduction and a discussion be initiated by the primary care clinician with the parents of children with documented OME of the procedure, alternatives, risks, benefits and expected outcomes of PE tube insertion being considered for otolaryngological referral (*Local Expert Consensus [E]*).

**Note:** It has been shown that insertion of tympanostomy tubes will reduce the total amount of time with effusions that a child will experience, but has not been shown to affect important speech/language development, behavior, or cognitive outcomes up to 4 years of age. Furthermore, prompt insertion of PE tubes (compared to delaying insertion 6-9 months) in otherwise healthy children with persistent (>3 months) OME in the first 3 years of life results in increased TM abnormalities compared to children selectively managed; however, this finding is of questionable clinical significance (*Johnston 2004 [A], Paradise 2001 [A]*).

<sup>c</sup> CCHMC Health Topic on [Alternative Therapy](#) .

Website: <http://www.cincinnatichildrens.org/health/info>

3. It is recommended that a child with middle ear effusion (MEE) of at least 3 months duration be referred for evaluation for PE tube insertion for:
- recurrent acute otitis media (history of 6 episodes over a 12 month period taking into account the severity of episodes, clustering of episodes, and persistence of otitis media with effusion)
  - moderate hearing loss ([Table 4](#))
  - anatomic changes developing secondary to OME or AOM
  - clinical symptoms of severe retraction pockets in the tympanic membrane; otalgia; tinnitus; or if neurologic problems related to balance are evident
  - complications from AOM or chronic OME (such as mastoiditis, facial nerve paralysis, disturbance in balance, or meningitis) (*Paradise 2001 [A], Engel-Yeger 2004 [C], Paradise 2002 [X]*).
4. It is recommended that a child with MEE for at least 3 months duration with mild hearing loss ([Table 4](#)) be considered for evaluation for PE tube insertion based in part upon risk factors (*Teele 1989 [C]*) which may include:
- developmental disorders (*Shott 2001 [C]*)
  - previous PE tubes
  - sibling history of ear infection
  - male gender
  - fall and winter season (*Gordon 2004 [C]*)
- Note 1:** Regardless of the laterality, continuity of OME, or degree of hearing loss (pure tone average loss of up to 40 dB), delay of tube insertion for 6 to 9 months in children <3 years of age in one large RCT did not result in significant differences, up to age 4, on any measure of speech, language production, cognition, child behavior, or parental stress (*Paradise 2003a [A], Paradise 2003b [A], Paradise 2001 [A]*).
- Note 2:** The decision to refer earlier or later for evaluation for PE tube insertion rests on the advantages of avoiding surgery due to resolution of OME during the period of delay versus the added advantage the surgery provides by being performed sooner rather than later in the cases which do not resolve. The value placed on these uncertain variables by clinicians, combined with the patient biology and family preferences may result in different decisions for different patient:clinician dyads.
- Note 3:** In a large RCT, in the group randomized to delay tube insertion for 6 to 9 months, 66% did not receive tubes by age 3 (*Paradise 2001 [A]*). Secondary analysis of

observational studies have shown the spontaneous rate of clinical resolution of OME to be 31% at 12 months (95% CI<sup>d</sup>: 0.19, 0.43) (*Rosenfeld 2003 [M]*).

5. It is recommended that a child with signs of speech delay be referred for a speech and language evaluation (*AAP 2004b [S]*).
6. It is recommended that appropriate and complete documentation, including what is expected from the specialist, accompany referrals to otolaryngologist, audiologist or speech pathologist (*Kuyvenhoven 1990 [D], AAP 2004b [S]*).

## **Education**

1. It is recommended that the family be counseled regarding the expected length of time the child may continue to have OME as well as the importance of follow-up for unresolved OME.
2. It is recommended that the family be educated about preventable risk factors. These include:
  - parental smoking or other sources of second-hand smoke (*Uhari 1996 [M], Ilicali 1999 [C]*);
  - exposure to others (especially family members) with upper respiratory infections (*Uhari 1996 [M]*);
  - excessive pacifier use, limiting use to when the child is falling asleep (*Uhari 1996 [M], Niemela 2000 [A]*).
3. It is recommended that the family of the child at risk for speech or language delay be educated regarding preventive strategies. See [Table 3](#).

Health Topics on CCHMC's website<sup>e</sup>:

- [Types of Hearing Tests](#)
- [Strategies for Children with Persistent Middle Ear Effusion](#)

See [Appendix](#) for a drawing of the middle ear and definitions and common names useful for patient / family education purposes.

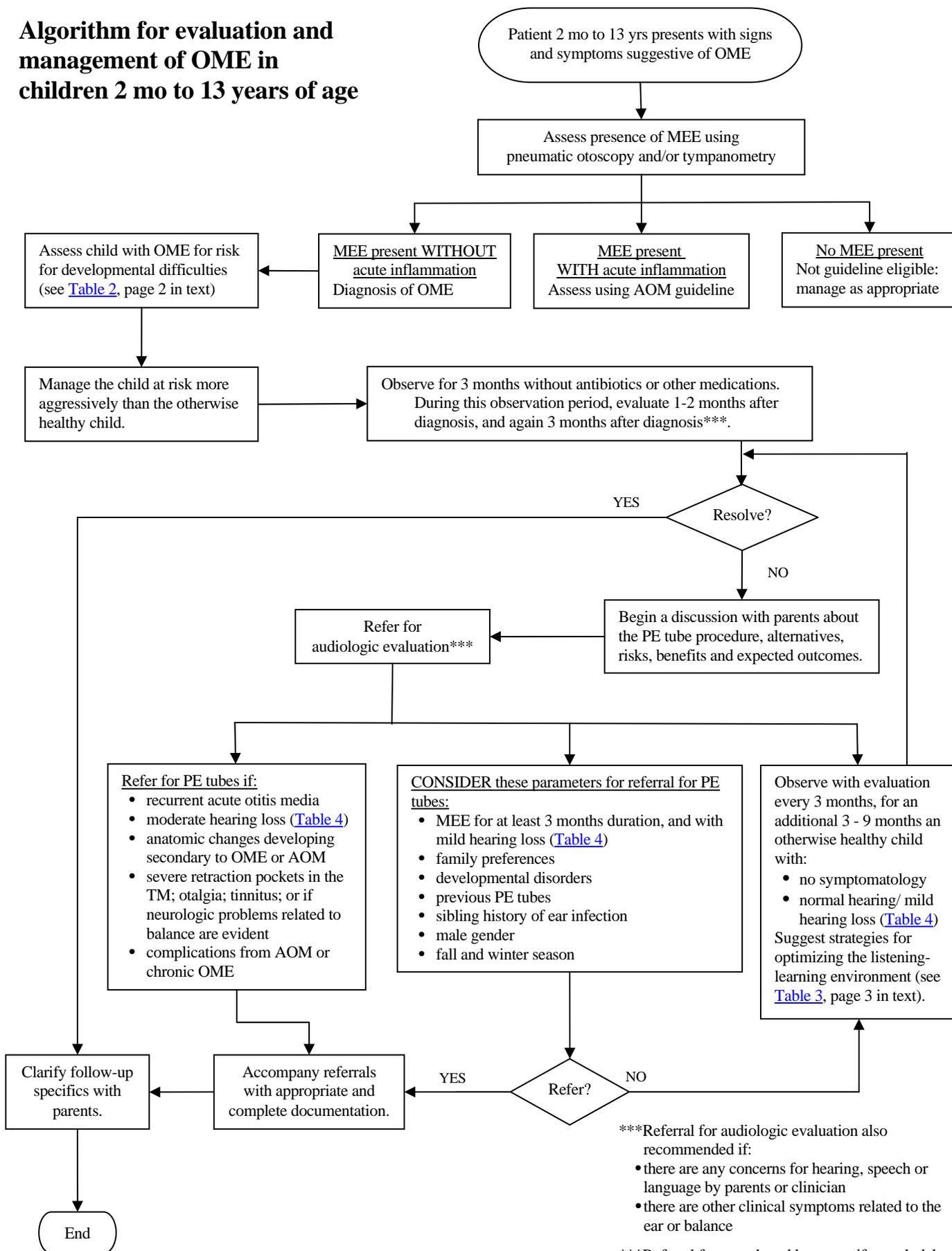
A parent information brochure, [Middle Ear Fluid and Your Child](#), is available for bulk purchase from the AAP<sup>f</sup>.

<sup>d</sup> 95%CI: 95% Confidence Interval expresses the uncertainty (precision) of a measured value; it is the range of values within which we can be 95% sure that the true value lies. A study with a larger sample size will generate more precise measurements, resulting in a narrower confidence interval.

<sup>e</sup> CCHMC Health Topic website:  
[www.cincinnatichildrens.org/health/info](http://www.cincinnatichildrens.org/health/info)

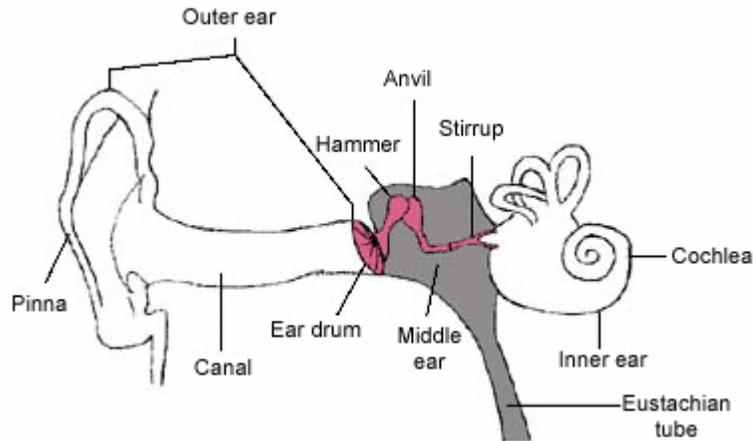
<sup>f</sup> AAP = American Academy of Pediatrics [www.aap.org](http://www.aap.org)

### Algorithm for evaluation and management of OME in children 2 mo to 13 years of age



\*\*\*Referral for audiologic evaluation also recommended if:  
 • there are any concerns for hearing, speech or language by parents or clinician  
 • there are other clinical symptoms related to the ear or balance

\*\*\*Referral for speech and language if speech delay.

**APPENDIX: Resources for patient / family education purposes****Drawing of the middle ear****Definitions and common names useful to non-clinicians**

| TERM                     | Common name or definition  |
|--------------------------|--|
| adenoidectomy            | removal of the adenoids (tissue in the back of the throat near the tonsils)  |
| anvil                    | the middle bone of the 3 bones of the middle ear; also called incus  |
| canal, external auditory | the passage leading from the opening of the external ear to the eardrum  |
| cerumen                  | earwax   |
| cochlea                  | a part of the inner ear, in the shape of a snail shell, which is the sensory organ of hearing  |
| effusion                 | fluid in the middle ear  |
| erythema                 | redness (of the eardrum)   |
| eustachian tube          | a tube connecting the middle ear to the back of the throat; responsible for equalizing pressure in the middle ear  |
| hammer                   | the outermost bone of the 3 bones of the middle ear; shaped like a hammer; also called malleus   |
| insufflation             | blowing air into the ear to determine mobility of the eardrum, an indication of the presence or absence of fluid   |
| mastoiditis              | infection of the bone behind the middle ear  |
| myringotomy              | a surgical cut in the eardrum to drain fluid   |
| otalgia                  | earache, pain in the middle ear  |
| otitis media             | inflammation of the middle ear   |
| otolaryngolog-           | referring to ENT, ear/nose/throat specialty  |
| otorrhea                 | discharge from the ear   |
| otoscopy                 | looking in the ear with an otoscope  |
| pinna                    | the part of the outer ear projecting from the head   |
| pneumatic otoscopy       | observing eardrum movement when air is blown into the ear; to determine mobility of the eardrum, an indication of the presence or absence of fluid   |
| rhinitis                 | runny nose   |
| stirrup                  | the innermost bone of the 3 bones of the middle ear; also called stapes  |
| tympanic membrane        | eardrum, also abbreviated TM   |
| tympanocentesis          | obtaining a sample of fluid from the middle ear to determine the presence of bacteria or virus   |
| tympanometry             | a measurement of the mobility of the eardrum to determine the presence of fluid  |
| tympanogram              | the graph from a tympanometry test   |
| tympanostomy tubes       | tubes surgically placed in the eardrum to re-establish ventilation to the middle ear, also called: <ul style="list-style-type: none"> <li>• ventilation tubes</li> <li>• PE tubes (pressure equalization tubes)</li> <li>• grommets</li> </ul> |

## Otitis Media with Effusion Team Members 2004

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## Development Process

The process by which this guideline was developed is documented in the Guideline Development Process Manual; a Team Binder maintains minutes and other relevant development materials. The recommendations contained in this guideline were formulated by an interdisciplinary working group which performed systematic and critical literature reviews, using the grading scale that follows, and examined current local clinical practices.

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| Evidence Based Grading Scale |   |   |                   |
|------------------------------|---|---|-------------------|
| A                            | Randomized controlled trial: large sample | S | Review article    |
| B                            | Randomized controlled trial: small sample | M | Meta-analysis     |
| C                            | Prospective trial or large case series    | Q | Decision analysis |
| D                            | Retrospective analysis                    | L | Legal requirement |
| E                            | Expert opinion or consensus               | O | Other evidence    |
| F                            | Basic laboratory research                 | X | No evidence       |

To select evidence for critical appraisal by the group, the citations in the AAP Clinical Practice Guideline for Otitis Media with Effusion were reviewed. Additionally, the Medline, EmBase and the Cochrane databases were searched for dates of January, 2003 through June, 2004 to generate an unrefined, "combined evidence" database using a search strategy focused on answering clinical questions relevant to OM and employing a combination of Boolean searching on human-indexed thesaurus terms (MeSH headings using an OVID Medline interface) and "natural language" searching on words in the title, abstract, and indexing terms. The citations were reduced by: eliminating duplicates, review articles, non-English articles, and adult articles. The resulting abstracts were reviewed by a methodologist to eliminate low quality and irrelevant citations. During the course of the guideline development, additional clinical questions were generated and subjected to the search process.

Appropriate companion documents have been developed to assist in the effective dissemination and implementation of the guideline.

Once the guideline has been in place for three years, the development team reconvenes to explore the continued validity of the guideline. This phase can be initiated at any point that evidence indicates a critical change is needed.

During formulation of these guidelines, the team members have remained cognizant of controversies and disagreements over the management of these patients. They have tried to resolve controversial issues by consensus where possible and, when not possible, to offer optional approaches to care in the form of information that includes best supporting evidence of efficacy for alternative choices.

The guidelines have been reviewed and approved by clinical experts not involved in the development process, senior management, Risk Management & Corporate Compliance, the Institutional Review Board, other appropriate hospital committees, and other individuals as appropriate to their intended purposes.

The guideline was developed without external funding. All Team Members and Clinical Effectiveness support staff listed have declared whether they have any conflict of interest.

**NOTE: These recommendations result from review of literature and practices current at the time of their formulations. This protocol does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the guidelines to meet the specific and unique requirements of individual patients. Adherence to this pathway is voluntary. The physician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.**

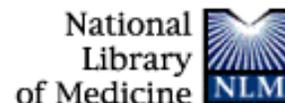
For more information about these guidelines, their supporting evidences and the guideline development process, contact the Health Policy & Clinical Effectiveness office at: 513-636-2501 or [HPCEInfo@cchmc.org](mailto:HPCEInfo@cchmc.org).

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Acute pain is one of the most common adverse stimuli experienced by children, occurring as a result of injury, illness, and necessary medical procedures. It is associated with increased anxiety, avoidance, somatic symptoms, and increased parent distress. Despite the magnitude of effects that acute pain can have on a child, it is often inadequately assessed and treated. Numerous myths, insufficient knowledge among caregivers, and inadequate application of knowledge contribute to the lack of effective management. The pediatric acute pain experience involves the interaction of physiologic, psychologic, behavioral, developmental, and situational factors. Pain is an inherently subjective multifactorial experience and should be assessed and treated as such. Pediatricians are responsible for eliminating or assuaging pain and suffering in children when possible. To accomplish this, pediatricians need to expand their knowledge, use appropriate assessment tools and techniques, anticipate painful experiences and intervene accordingly, use a multimodal approach to pain management, use a multidisciplinary approach when possible, involve families, and advocate for the use of effective pain management in children.

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