



**MedStar Health**

## **Managing Otitis Media in Children Ages 6 Months – 18 Years Clinical Practice Guideline**

**MedStar Health**

*"These guidelines are provided to assist physicians and other clinicians in making decisions regarding the care of their patients. They are not a substitute for individual judgment brought to each clinical situation by the patient's primary care provider in collaboration with the patient. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication but should be used with the clear understanding that continued research may result in new knowledge and recommendations."*

MedStar Pediatrics and MedStar Family Choice endorse and adapted the clinical guidelines set forth by the American Academy of Pediatrics: The Diagnosis and Management of Acute Otitis Media, 2013.

**The online version of this article is available at:**

<http://pediatrics.aappublications.org/content/131/3/e964>

The purpose of this guideline is to present current information on the diagnosis and treatment of acute otitis media in the pediatric patient. In the United States, otitis media is the most common diagnosis resulting in an antibiotic prescription for children. However, the diagnosis of Acute Otitis Media (AOM) is not always straightforward. The clinical presentation evolves with time and varies with the age of the patient. A thorough history along with a good physical exam of the ear, specifically the tympanic membranes need to be considered in making the diagnosis of AOM in order limit unnecessary antibiotic prescriptions while ensuring that pediatric patients get an antibiotic when needed.

### **Definition Key:**

- AOM – acute otitis media
- OME – otitis media with effusion
- MEE – middle ear effusion
- TM – tympanic membrane

### **Acute otitis media (AOM)**

- Common bacterial pathogens include *streptococcus pneumoniae*, *non-typeable Haemophilus influenzae*, and *Moraxella catarrhalis*.

### **CLINICAL PRESENTATION**

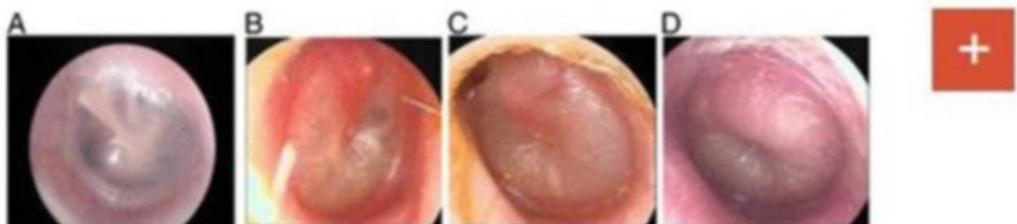
- Rapid onset of ear pain verbally expressed or implied by behavior changes including tugging/rubbing ears, increased crying, irritability and/or sleep disruption.
- Presence of fever is variable.
- Frequently occur with viral upper respiratory prodrome.

### **RISK FACTOR FOR OTITIS MEDIA**

Risk factors for AOM include young age and frequent contact with other children, which increases exposure to viral illnesses. Other risk factors include orofacial abnormalities (such as cleft palate), household crowding, exposure to cigarette smoke, pacifier use, shorter duration of breastfeeding, prolonged bottle-feeding while lying down and a family history of otitis media.

### CLINICAL EXAM

- The pneumatic otoscope is the standard tool used in the diagnosis of OM.<sup>1</sup> Clinicians must become proficient with the use of this tool to distinguish Otitis Media with Effusion (OME) from AOM.
- OME is the presence of a Middle Ear Effusion (MEE) without clinical symptoms. The Tympanic Membrane (TM) will appear to have fluid behind it. This may look cloudy, opaque, yellow, have air bubbles or an air fluid level. The typical landmarks may be obscured. A light reflex may still be present. It may precede or follow an episode of AOM or may be the result of fluid collecting in the middle ear space due to eustachian tube dysfunction. OME does not require antibiotic or medication treatment and typically will spontaneously resolve. MEE is common in children.
- Acute Otitis Media is due to infection in the MEE. Bulging of the tympanic membrane (TM) with impaired mobility is the most important characteristic in the diagnosis of AOM.<sup>1</sup> TM color that is hemorrhagic or red is correlated with acute otitis media.
- Otorrhea can be a sign of AOM. This is typically due to a perforation of the TM. It can also be associated with acute otitis externa or tympanostomy tube drainage. A small perforation of the TM will spontaneously heal and there is no additional medication management necessary other than treatment of the AOM. Consider ENT referral for a persistent perforation.
- MEE is necessary for the diagnosis of AOM. A TM that appears red without effusion does not meet diagnostic criteria for AOM.
- See Figure 2 for examples of Tympanic Membrane physiology.



**FIGURE 2**

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A, Normal TM. B, TM with mild bulging. C, TM with moderate bulging. D, TM with severe bulging. Courtesy of Alejandro Hoberman, MD.

*Figure 2 Tympanic Membrane Physiology*

### DIAGNOSIS

- Moderate to severe bulging of the TM or new onset otorrhea without acute otitis media or tympanostomy tubes in absence of other symptoms.
- Significant expression of ear pain with mild bulging of TM or intense erythema of TM.

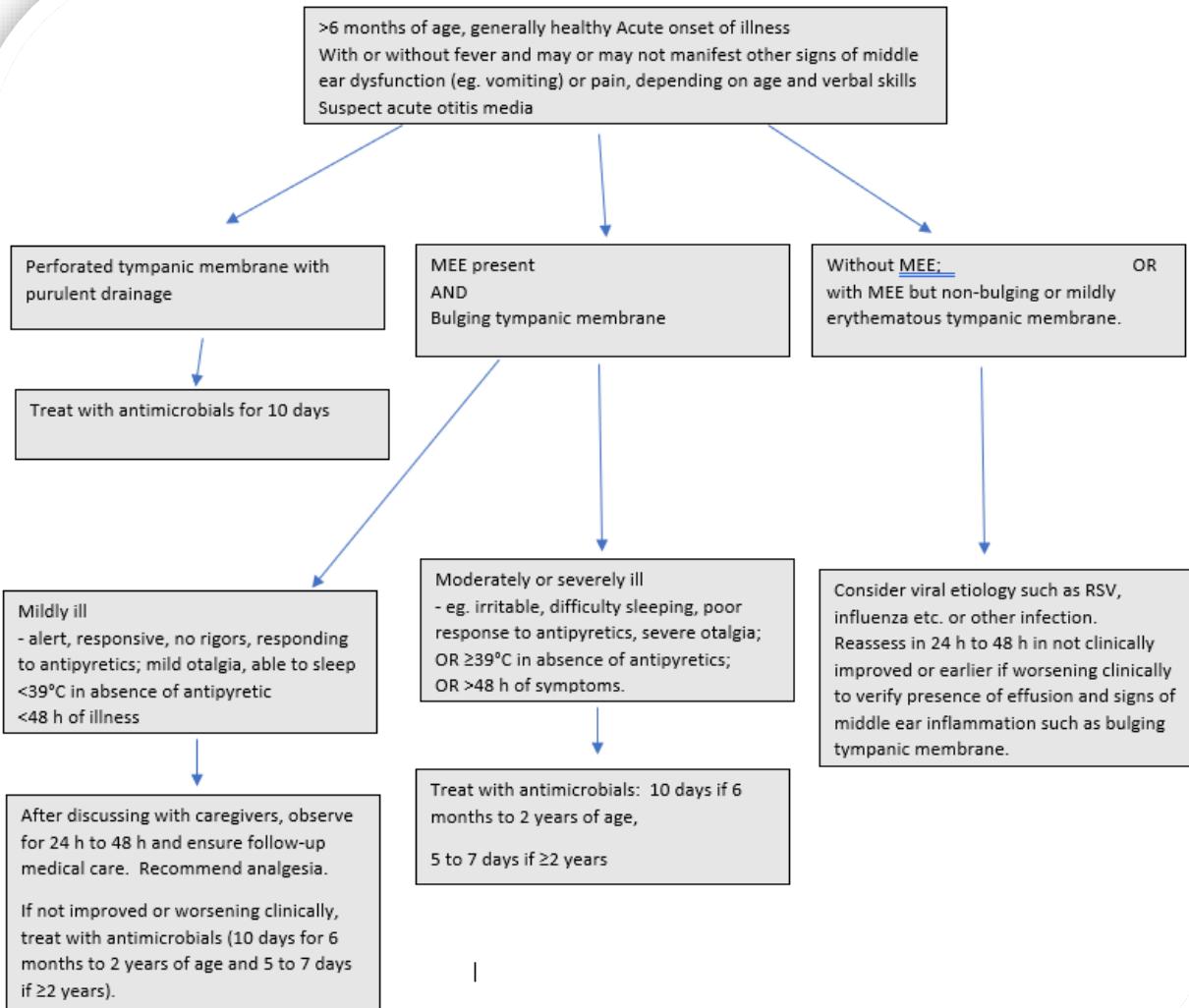
## **TREATMENT**

### **1. Pain management.**

AOM is painful and the pain may persist for 2 to 3 days into the course even with antibiotic treatment when appropriate. Use ibuprofen (age > 6 months) or acetaminophen for pain control. Topical benzocaine has been removed from the market due to safety concerns. Opioids are not necessary for pain control for AOM.

### **2. Observation.**

This is an option for management of non-severe unilateral AOM in children 6-23 months of age or for non-severe unilateral or bilateral AOM in older children (as many of these infections are viral in origin). Non-severe means the ear discomfort is mild, less than 48-hour duration and fever is less than 39° C. The decision to observe with close follow-up should be based on joint decision making with the parent/caregiver. There must be a plan in place to ensure follow-up if the child's condition worsens or fails to improve in 48 hours of observation. This plan could include having a follow-up appointment, having the ability to call to discuss the child's condition with the possibility of calling in a prescription or giving the parent a prescription to hold to fill if not improving or worsening symptoms. That prescription should have a note to void in 3 to 5 days after the issue date.



This chart is based on: Le Saux, Nicole, Robinson, Joan L, and Canadian Paediatric Society, Infectious Diseases and Immunization Committee. Management of acute otitis media in children. *Pediatr Child Health* 2016 Jan-Feb 21 (1): 39-44.

### 3. Indications for antibiotic therapy:

Age	Otorrhea with AOM	Unilateral or bilateral AOM with severe symptoms <sup>1</sup>	Bilateral AOM without otorrhea	Unilateral AOM without otorrhea
6 months to < 2 years	Treat with antibiotics	Treat with antibiotics	Treat with antibiotics	Can consider observation
2 years and older	Treat with antibiotics	Treat with antibiotics	Can consider observation	Can consider observation

<sup>1</sup> Toxic-appearing child, persistent otalgia > 48h, temperature ≥ 39°C in the past 48h

4. Unilateral or bilateral AOM in children over 6 months of age with severe symptoms including moderate to severe pain at presentation or any pain for at least 48 hours or fever of 39° C or higher.
5. Bilateral AOM in children 6 to 23 months with mild signs and symptoms of AOM for less than 48 hours including expression of mild otalgia/discomfort and fever less than 39 ° C.
6. Amoxicillin is the first line treatment for AOM.
7. Amoxicillin clavulanate is recommended in the following scenarios:
  1. For AOM which does not respond to initial therapy with Amoxicillin after 48 to 72 hours of treatment.
  2. In children who have already completed a course of amoxicillin in the previous 30 days.
  3. AOM with purulent conjunctivitis as this is most likely due to *H. influenza* which is often beta lactamase resistant.
  4. For children who have a history of recurrent AOM unresponsive to Amoxicillin in the past.

- **Alternative antibiotics or if penicillin allergic:**

- Cefdinir,
- Cefpodoxime
- Ceftriaxone

- **Not recommended:**

- Macrolides such as erythromycin and azithromycin due to their limited efficacy against *H. influenza* and *S. pneumonia*.
- Trimethoprim-sulfamethoxazole and erythromycin-sulfisoxazole due to substantial *S. pneumoniae* resistance patterns.

**4. Antibiotic therapy: (Duration 5 days if  $\geq$  6years old, 7 days if 2-5 years old, 10 days if < 2 years old or if severe symptoms)**

[PLEASE NOTE: MEDICATIONS DOSAGES BELOW ARE LISTED PER DOSE]

Initial therapy		If no improvement after 48-72h of initial therapy	
First line	Penicillin allergic	First line	Penicillin allergic
<b>Amoxicillin</b> 45 mg/kg/dose PO q12h (max up to 2000 mg/dose)  <b>If received Amoxicillin within 30 days:</b>  <b>Amoxicillin/clavulanate</b> 45 mg/kg/dose of Amoxicillin component PO q12h using the high dose amoxicillin/clavulanate 600/42.9 in 5 ml) or amox/clav 875 mg tablet (max up to 2 grams amoxicillin component q12)	<b>Cefdinir</b> 7 mg/kg/dose PO q12h (max 300mg/dose) <b>or</b> 14 mg/kg/dose PO q24h (max 600mg/dose)  <b>or</b> <b>Cefuroxime</b> 15 mg/kg/dose PO q12h (max 500mg/dose)  <b>or</b> <b>Ceftriaxone</b> 50 mg/kg/dose IV/IM q24h (max 1000mg/dose) for 1-3 days  <b>or</b> Severe Penicillin allergy: <b>Levofloxacin</b> <b>6 months to &lt;5years:</b> 10 mg/kg/dose PO q12h (max 500 mg/day)  <b><math>\geq</math>5 years:</b> 10mg/kg/dose PO q24h (max 500 mg/day)	<b>Amoxicillin/clavulanate</b> <b>or</b> <b>Ceftriaxone</b> for up to 3 days <b>or</b> <b>Levofloxacin</b>	<b>Ceftriaxone</b> for up to 3 days <b>or</b> <b>Levofloxacin</b>

## **5. Duration of Therapy**

Several studies have been done reviewing the duration of therapy. Clinicians must weigh the benefit of antibiotic therapy and antibiotic stewardship.

**The current recommendations are:**

- For children younger than 24 months or with severe symptoms at any age, a 10-day course should be used.
- For children 2 through 5 years of age without severe symptoms, a 5- to 7-day course may be used.
- For children 6 years and older without severe symptoms, observation or a 5- to 7-day course may be used.

## **6. Prophylactic Antibiotic Therapy to reduce frequency of recurrent AOM is no longer recommended.**

## **7. Referral to ENT:**

- Recurrent AOM= 3 or more episodes of AOM in a 6-month period or 4 or more episodes of AOM in a 12-month period with at least 1 episode in the preceding 6 months for consideration of tympanostomy tubes.
- Severe AOM which is not responding to usual therapy.

## **PREVENTIVE STRATEGIES**

1. Appropriate vaccinations on schedule recommended by ACIP including pneumococcal conjugate vaccine (PCV 13) and Influenza vaccine.
2. Breastfeeding for the first 6 months of life or longer, if possible
3. If bottle feeding, ensure that baby is in an upright position
4. Eliminate smoke exposure.
5. Good hand hygiene to minimize recurrent viral upper respiratory infections.
6. Avoidance of daycare or frequent contact with young children.

## **ACUTE OTITIS MEDIA IN CHILDREN WITH TYMPANOSTOMY TUBES**

1. Often presents with sudden onset of purulent otorrhea
2. Common pathogens include *Staphylococcus aureus* and *Pseudomonas aeruginosa* as they often colonize the external ear canal as well as *Streptococcus pneumonia*, *Haemophilus influenza* and *Moraxella catarrhalis*.
3. Topical antibiotic therapy preferred due to higher local concentrations and less GI side effects.
4. Topical fluoroquinolones Ofloxacin and Ciprofloxacin with or without dexamethasone are safe and effective.
5. Gentle debridement of the ear canal of exudates helps penetration of antibiotic drops to the tympanic membrane area.

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