



**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>

General Principles: Otitis Media (inflammation to the middle ear) is one of the most common bacterial infections in childhood and the most commonly diagnosed pediatric illness. Almost all children experience one or more episodes of otitis media before the age of 6. These guidelines were adapted to provide consistent cost effective, high quality care. These guidelines are not intended either to replace a clinicians’ judgment or to establish a protocol for all patients with a particular condition.

Diagnosis:

Definition Key:

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

Symptoms: Older children with AOM usually present with a history of rapid onset of ear pain. However, in young preverbal children, otalgia as suggested by tugging/rubbing/holding of the ear, excessive crying, fever, or changes in the child’s sleep or behavior pattern as noted by the parent are often relatively nonspecific symptoms.

Signs: Color (hemorrhagic, strongly red, or moderately red, cloudy), Position (bulging) and Mobility (distinctly impaired) were the three characteristics that should be assessed to determine AOM. Investigators determined that the combination of a “cloudy,” bulging TM with impaired mobility was the best predictor of AOM using the symptom-based diagnosis in one study. Impaired mobility had the highest sensitivity and specificity (approximately 95% and 85%, respectively). Cloudiness had the next best combination of high sensitivity (~74%) and high specificity (~93%) in this study. Bulging had high specificity (~97%) but lower sensitivity (~51%). A TM that was hemorrhagic, strongly red, or moderately red also correlated with the presence of AOM, and a TM that was only “slightly red” was not helpful diagnostically.

Key Action Statement 1A: Clinicians should diagnose acute otitis media (AOM) in children who present with moderate to severe bulging of the tympanic membrane (TM) or new onset of otorrhea not due to acute otitis externa. Evidence Quality: Grade B. Strength: Recommendation.

Key Action Statement 1B: Clinicians should diagnose AOM in children who present with mild bulging of the TM and recent (less than 48 hours) onset of ear pain (holding, tugging, rubbing of the ear in a nonverbal child) or intense erythema of the TM. Evidence Quality: Grade C. Strength: Recommendation.

Key Action Statement 1C: Clinicians should not diagnose AOM in children who do not have middle ear effusion (MEE) (based on pneumatic otoscopy and/or tympanometry). Evidence Quality: Grade B. Strength: Recommendation.

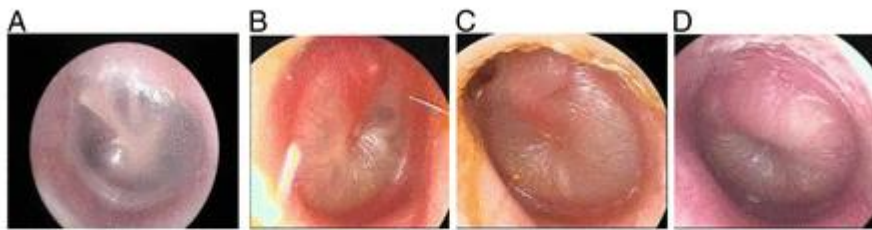


FIGURE 2

[Download figure](#) | [Open in new tab](#) | [Download powerpoint](#)

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

Pain management: Pain is a key finding in AOM and should be managed effectively.

Key Action Statement 2: The management of AOM should include an assessment of pain. If pain is present, the clinician should recommend treatment to reduce pain. Evidence Quality: Grade B. Strength: Strong Recommendation.

TABLE 3

Treatments for Otolgia in AOM

Treatment Modality	Comments
Acetaminophen, ibuprofen ⁶³	Effective analgesia for mild to moderate pain. Readily available. Mainstay of pain management for AOM.
Home remedies (no controlled studies that directly address effectiveness)	May have limited effectiveness.
Distraction	
External application of heat or cold	
Oil drops in external auditory canal	
Topical agents	
Benzocaine, procaine, lidocaine ^{65,67,70}	Additional, but brief, benefit over acetaminophen in patients older than 5 y.
Naturopathic agents ⁶⁸	Comparable to amethocaine/phenazone drops in patients older than 6 y.
Homeopathic agents ^{71,72}	No controlled studies that directly address pain.
Narcotic analgesia with codeine or analogs	Effective for moderate or severe pain. Requires prescription; risk of respiratory depression, altered mental status, gastrointestinal tract upset, and constipation.
Tympanostomy/myringotomy ⁷³	Requires skill and entails potential risk.



Infectious Illness Management:

Key Action Statement 3A: Severe AOM: The clinician should prescribe antibiotic therapy for AOM (bilateral or unilateral) in children 6 months and older with severe signs or symptoms (ie, moderate or severe otalgia or otalgia for at least 48 hours or temperature 39°C [102.2°F] or higher). Evidence Quality: Grade B. Strength: Strong Recommendation.

Key Action Statement 3B: Nonsevere bilateral AOM in young children: The clinician should prescribe antibiotic therapy for bilateral AOM in children 6 months through 23 months of age without severe signs or symptoms (ie, mild otalgia for less than 48 hours and temperature less than 39°C [102.2°F]). Evidence Quality: Grade B. Strength: Recommendation.

Key Action Statement 3C: Nonsevere unilateral AOM in young children: The clinician should either prescribe antibiotic therapy *or* offer observation with close follow-up based on joint decision-making with the parent(s)/caregiver for unilateral AOM in children 6 months to 23 months of age without severe signs or symptoms (ie, mild otalgia for less than 48 hours and temperature less than 39°C [102.2°F]). When observation is used, a mechanism must be in place to ensure follow-up and begin antibiotic therapy if the child worsens or fails to improve within 48 to 72 hours of onset of symptoms. Evidence Quality: Grade B. Strength: Recommendation.

Key Action Statement 3D: Nonsevere AOM in older children: The clinician should either prescribe antibiotic therapy *or* offer observation with close follow-up based on joint decision-making with the parent(s)/caregiver for AOM (bilateral or unilateral) in children 24 months or older without severe signs or symptoms (ie, mild otalgia for less than 48 hours and temperature less than 39°C [102.2°F]). When observation is used, a mechanism must be in place to ensure follow-up and begin antibiotic therapy if the child worsens or fails to improve within 48 to 72 hours of onset of symptoms. Evidence Quality: Grade B. Strength: Recommendation.

TABLE 4

Recommendations for Initial Management for Uncomplicated AOM^a

Age	Otorrhea With AOM ^a	Unilateral or Bilateral AOM ^a With Severe Symptoms ^b	Bilateral AOM ^a Without Otorrhea	Unilateral AOM ^a Without Otorrhea
6 mo to 2 y	Antibiotic therapy	Antibiotic therapy	Antibiotic therapy	Antibiotic therapy or additional observation
≥2 y	Antibiotic therapy	Antibiotic therapy	Antibiotic therapy or additional observation	Antibiotic therapy or additional observation ^c

- ^a Applies only to children with well-documented AOM with high certainty of diagnosis (see Diagnosis section).
- ^b A toxic-appearing child, persistent otalgia more than 48 h, temperature ≥39°C (102.2°F) in the past 48 h, or if there is uncertain access to follow-up after the visit.
- ^c This plan of initial management provides an opportunity for shared decision-making with the child's family for those categories appropriate for additional observation. If observation is offered, a mechanism must be in place to ensure follow-up and begin antibiotics if the child worsens or fails to improve within 48 to 72 h of AOM onset.



Antibiotic Treatment:

Key Action Statement 4A: Clinicians should prescribe amoxicillin for AOM when a decision to treat with antibiotics has been made *and* the child has not received amoxicillin in the past 30 days *or* the child does not have concurrent purulent conjunctivitis *or* the child is not allergic to penicillin. Evidence Quality: Grade B. Strength: Recommendation.

Key Action Statement 4B: Clinicians should prescribe an antibiotic with additional β -lactamase coverage for AOM when a decision to treat with antibiotics has been made, *and* the child has received amoxicillin in the last 30 days *or* has concurrent purulent conjunctivitis, *or* has a history of recurrent AOM unresponsive to amoxicillin. Evidence Quality: Grade C. Strength: Recommendation.

Key Action Statement 4C: Clinicians should reassess the patient if the caregiver reports that the child’s symptoms have worsened or failed to respond to the initial antibiotic treatment within 48 to 72 hours and determine whether a change in therapy is needed. Evidence Quality: Grade B. Strength: Recommendation.

NOTE – *There is a known rate of 0.1% of patients that may fail to respond to initial antibiotic treatment.* If patient fails to respond to the initial management option within 48-72 hours, the clinician should reassess the patient to confirm AOM. If AOM is confirmed in the patient initially managed with observation, the clinician should begin new antibacterial therapy. If the patient was initially managed with an antibacterial agent, the clinician should change the agent.

TABLE 5

Recommended Antibiotics for (Initial or Delayed) Treatment and for Patients Who Have Failed Initial Antibiotic Treatment

Initial Antibiotic Treatment at AOM Diagnosis or After Observation		Antibiotic Treatment After 48-72 Hours of Initial Antibiotic Treatment Failure	
Recommended First-Line Treatment	Alternative Treatment	Recommended First-Line Treatment	Alternative Treatment
Amoxicillin (80-90 mg/kg per day)	Cefdinir (14 mg/kg per day in 1 or 2 doses),	Amoxicillin-clavulanate (90 mg/kg per day of amoxicillin, with 6.4 mg/kg per day of clavulanate)	Ceftriaxone, 3 d, or Clindamycin (30-40 mg/kg per day in 3 divided doses), with or without second- or third-generation cephalosporin
OR	Cefuroxime (30 mg/kg per day in 2 divided doses),	OR	
Amoxicillin-clavulanate ^a (90 mg/kg per day of amoxicillin, with 6.4 mg/kg per day of clavulanate)	Cefpodoxime (10 mg/kg per day in 2 divided doses), or	Ceftriaxone (50 mg/kg per day IM or IV for 3 d)	Clindamycin plus second- or third-generation cephalosporin
	Ceftriaxone (50 mg/kg per day IM or IV for 1 to 3 d)		Tympanocentesis ^b
			Consult specialist ^b

- ^a May be considered in patients who have received amoxicillin in the previous 30 d or who have the otitis-conjunctivitis syndrome.
- ^b Perform tympanocentesis/drainage if skilled in the procedure or seek a consult from an otolaryngologist for tympanocentesis/drainage. If the tympanocentesis reveals multidrug-resistant bacteria, then seek an infectious disease specialist consultation.

Duration of Therapy:

The optimal duration of therapy for patients with AOM is uncertain; the usual 10-day course of therapy was derived from the duration of treatment of streptococcal pharyngotonsillitis. Several studies favor standard 10-day therapy over shorter courses for children younger than 2 years.

- **Children younger than 2 years and children with severe symptoms, a standard 10-day course is recommended.**
- **Children 2 to 5 years of age with mild or moderate AOM, 7-day course of oral antibiotic appears to be equally effective.**
- **For children 6 years and older with mild to moderate symptoms, a 5- to 7-day course is adequate treatment.**

Follow up evaluation:

There is little scientific evidence for a routine 10- to 14-day reevaluation visit for all children with an episode of AOM. The physician may choose to reassess some children, such as young children with severe symptoms or recurrent AOM or when specifically requested by the child's parent.

Key Action Statement 5A: Clinicians should not prescribe prophylactic antibiotics to reduce the frequency of episodes of AOM in children with recurrent AOM. Evidence Quality: Grade B. Strength: Recommendation.

Key Action Statement 5B: Clinicians may offer tympanostomy tubes for recurrent AOM (3 episodes in 6 months or 4 episodes in 1 year with 1 episode in the preceding 6 months). Evidence Quality: Grade B. Strength: Option.

Patient Education/Counseling:

Patient information is available through **KIDSHEALTH** Handouts in Cerner/MedConnect

Risk Reduction Strategies:

Key Action Statement 6A: Clinicians should recommend pneumococcal conjugate vaccine to all children according to the schedule of the Advisory Committee on Immunization Practices of the Centers for Disease Control and Prevention, American Academy of Pediatrics (AAP), and American Academy of Family Physicians (AAFP). Evidence Quality: Grade B. Strength: Strong Recommendation.

Key Action Statement 6B: Clinicians should recommend annual influenza vaccine to all children according to the schedule of the Advisory Committee on Immunization Practices, AAP, and AAFP. Evidence Quality: Grade B. Strength: Recommendation.

Key Action Statement 6C: Clinicians should encourage exclusive breastfeeding for at least 6 months. Evidence Quality: Grade B. Strength: Recommendation.

Key Action Statement 6D: Clinicians should encourage avoidance of tobacco smoke exposure. Evidence Quality: Grade C. Strength: Recommendation.

Management of Otitis Media with Effusion:

Persistent MEE is common and can be detected by pneumatic otoscopy (with or without verification by tympanometry) after resolution of acute symptoms. Two weeks after successful antibiotic treatment of AOM, 60% to 70% of children have MEE, decreasing to 40% at 1 month and 10% to 25% at 3 months after successful antibiotic treatment. [177,195](#)
The presence of MEE without clinical symptoms is defined as OME. OME must be differentiated clinically from AOM and requires infrequent additional monitoring but not antibiotic therapy. Assurance that OME resolves is particularly important



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for parents of children with cognitive or developmental delays that may be affected adversely by transient hearing loss associated with MEE.

Recommendations and options were developed for the diagnosis and management of otitis media with effusion in otherwise healthy young children.

- Use pneumatic otoscopy to assess middle ear status. *Recommended for assessment of the middle ear because it combines visualization of the tympanic membrane (otoscopy) with a test of membrane mobility (pneumatic otoscopy). When pneumatic otoscopy is performed by an experienced examiner, the accuracy for diagnosis of otitis media with effusion may be between 70% and 79%.*
- Tympanometry may be performed to confirm suspected otitis media with effusion.
- A child who has had fluid in both middle ears for a total of 3 months should undergo hearing evaluation. Before 3 months of effusion, hearing evaluation is an option.

References:

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2. Qureishi, a., Lee, Yan, Belfield, K., Birchall, JP, Daniel, M., 2014. Update on otitis media – prevention and treatment. *Infection and Drug Resistance.*, January 10, 2014, 7, 15-24.
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