Diagnosis and Management of Acute Otitis Media
(Ages 6 months to 12 years)

Guideline History

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<tr>
<td>Original Approve Date</td>
<td>08/94</td>
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<tr>
<td>Review/Revise Dates</td>
<td>03/96, 06/98, 03/99, 01/01, 02/03, 10/04, 02/05, 03/05, 03/07, 2/09, 01/11, 1/13, 01/15, 01/17, 01/19</td>
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<td>Next Review Date</td>
<td>01/21</td>
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DIAGNOSIS:

- **Acute Otitis Media (AOM)** must meet the three part definition: acute onset symptoms, presence of middle ear effusion diagnosed by pneumatic otoscope or tympanometry, and acute middle ear inflammation (intense redness of tympanic membrane, moderate to severe bulging of tympanic membrane; new onset discharge due to perforation; mild bulging of ear drum and onset of pain within 48 hours).

SIGN AND SYMPTOMS:

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Sign</th>
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<tbody>
<tr>
<td>Fever</td>
<td>Difficulty sleeping</td>
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<tr>
<td>Ear pain</td>
<td>Ear “popping” or “fullness”</td>
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<tr>
<td>Crying</td>
<td>Hearing loss</td>
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<tr>
<td>Irritability</td>
<td>Balance problems</td>
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<tr>
<td>Tugging or pulling at ear(s)</td>
<td>Dizziness</td>
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<tr>
<td>Drainage of fluid or</td>
<td>poor feeding</td>
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<tr>
<td>Pus from ear</td>
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Ear pain in non-verbal children could be indicated by holding, tugging or rubbing the ear.

OTHER DEFINITIONS:

- **Otitis Media with effusion (OME)**: the presence of fluid in the middle ear without signs or symptoms of ear infection
- **Chronic Otitis Media with effusion (COME)**: when infection persists over a long period of time (at least 3 months)
- **Persistent Acute Otitis Media**: continued findings of AOM present within 6 days of finishing a course of antibiotics
- **Recurrent Acute Otitis Media**: a minimum of 3 episodes of AOM in a 6 month period or 4 episodes the prior year with one occurring in the last 6 months.

CHILDREN AT INCREASED RISK FOR RECURRENT ACUTE OTITIS MEDIA:

- Cleft palate
- Craniofacial abnormalities
- Down's syndrome
- First episode early (under six months)
- Family history of recurrent acute otitis media
- Day care attendance
- Exposure to tobacco smoke or other respiratory irritants and allergens
- Lack of breast feeding
- Ethnic origin: Native American or Inuit (Eskimo)
- Age
- Supine Feeding position
- Use of pacifiers beyond 10 months of age
- Immune deficiency
- GERD
- History of seasonal allergies
- Presence of enlarged adenoids
- Frequent upper respiratory infections
PREVENTIVE MEASURES:

- Encourage breast feeding
- Feed child upright if bottle fed
- Avoid exposure to passive smoke
- Limit exposure to numbers of children to extent possible
- Teach adults and children careful hand washing
- Limit exposure to viral URI’s
- Avoid pacifier beyond 10 months of age
- Ensure immunizations are up to date including influenza vaccine and pneumococcal conjugate vaccine

TREATMENT:

Acute otitis media (AOM):

- Amoxicillin remains the first line agent. Drugs that have additional beta-lactamase coverage are used for those who have already had amoxicillin in the previous 30 days, those with concurrent conjunctivitis, or who are allergic to penicillin.
- If < 6 months, treat with antibiotics
- If > 6 months, treat with antibiotics for severe bilateral or unilateral AOM based on ear pain that is moderate or severe, lasts for at least 48 hrs., or is accompanied by temperature of > 102.2F (> 39C)
- In less severe cases, watchful waiting could be offered instead of antibiotics unless both ears are affected for ages 6-23 months.
- If patient fails to respond to the initial management within 48-72 hours, reassess to confirm AOM diagnosis and exclude other causes of illness
- Management should include pain assessment. If present, recommend treatment to decrease pain (oral) acetaminophen and/or ibuprofen.
- Teach prevention of AOM through reduction of risk factors
- It is not recommended to use other therapies such as steroids, antihistamines, or decongestants. Antihistamines may actually prolong middle ear effusion
- **Prophylactic antibiotics should not be prescribed to reduce recurrences.** Consider ENT referral for Tympanostomy Tubes.
- Instruct in comfort measures:
  - Warm compresses to ear
  - Elevate head of bed or crib
  - Analgesic ear drops for children > 5years old (if ventilating tubes and/or visible drainage are not present)

Severe Illness is defined as a toxic appearing child, persistent otalgia more than 48 hrs, ≥ 102.2 degrees Fahrenheit (≥ 39 degrees C) in the past 48 hours, or if there is uncertain access to follow-up.

The observation option is limited to healthy children over the age of 6 months. The caregiver must agree to the option, be able to monitor the child and return should conditions worsen. Systems must be in place for ready communication with the clinician, for re-evaluation, and obtaining medication if needed. Giving the caregiver the prescription for antibiotic treatment at the initial assessment with the understanding to fill only if symptoms do not improve or worsen within 48-72 hours is recommended. This is referred to as a "safety net antibiotic prescription (SNAP)."
Otitis Media with Effusion:

- Observe
- Recheck in 4-6 weeks
- Refer for hearing evaluation if OME present bilaterally for at least 3 months or longer
- Refer to ENT if with bilateral OME for at least 3 months or longer AND with documented hearing difficulties.
- Refer to ENT if with bilateral or unilateral OME for at least 3 months or longer AND symptoms likely attributable to OME such as balance (vestibular) problems, poor school performance, behavior problem, ear discomfort.

CONSIDER ENT REFERRAL: A child should meet one of the following criteria for ear, nose and throat (ENT) specialist referral for consideration of ventilating tubes:

- Impending or actual complication of otitis media including:
  - Mastoiditis
  - Facial nerve paralysis
  - Lateral (sigmoid) sinus thrombosis
  - Meningitis
  - Brain abscess
  - Labyrinthitis
  - Tympanic membrane perforation
  - Delayed speech
  - Hearing loss
- Patients in high-risk categories:
  - Craniofacial anomalies
  - Down's syndrome
  - Cleft palate
  - Patients with speech and language delay
- Recurrent acute otitis media
- Refractory acute otitis media with moderate to severe symptoms unresponsive to at least two antibiotics
- Development of advanced middle-ear disease involving tympanic membrane atrophy, retraction pockets, ossicular erosion or cholesteatoma
- Medical treatment failure secondary to multiple drug allergy or intolerance
- At least two recurrences of otitis media within two to three months following ventilating tube extrusion with failed medical management
Antibacterial choice should be guided by the likely pathogen(s) in the community and clinical experience**
<table>
<thead>
<tr>
<th>Age</th>
<th>Otorrhea With AOM&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Unilateral or Bilateral AOM&lt;sup&gt;a&lt;/sup&gt; With Severe Symptoms&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Bilateral AOM&lt;sup&gt;a&lt;/sup&gt; Without Otorrhea</th>
<th>Unilateral AOM&lt;sup&gt;a&lt;/sup&gt; Without Otorrhea</th>
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<tbody>
<tr>
<td>6 mo. to 2 y</td>
<td>Antibiotic therapy</td>
<td>Antibiotic therapy</td>
<td>Antibiotic therapy</td>
<td>Antibiotic therapy or additional observation</td>
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<tr>
<td>≥2 y</td>
<td>Antibiotic therapy</td>
<td>Antibiotic therapy</td>
<td>Antibiotic therapy or additional observation</td>
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<sup>a</sup> Applies only to children with well documented AOM with high certainty of diagnosis. (See Diagnosis section).

<sup>b</sup> 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.

<sup>c</sup> 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.

From the American Academy of Pediatrics Vol. 131 No. 3 March 1, 2013
<table>
<thead>
<tr>
<th>Initial Antibiotic Treatment at AOM Diagnosis or After Observation</th>
<th>Antibiotic Treatment After 48–72 Hours of Initial Antibiotic Treatment Failure</th>
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<tr>
<td><strong>Recommended First Line Treatment</strong></td>
<td><strong>Alternative Treatment</strong></td>
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<tr>
<td>Amoxicillin (80–90 mg/kg per day)</td>
<td>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)</td>
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<tr>
<td>OR</td>
<td>Cefuroxime (30 mg/kg per day in 2 divided doses), Cefpodoxime (10 mg/kg per day in 2 divided doses), or Cefpodoxime (10 mg/kg per day in 2 divided doses), or</td>
</tr>
<tr>
<td>Amoxicillin–clavulanate* (90 mg/kg per day amoxicillin, with 6.4 mg/kg per day of clavulanate)</td>
<td>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</td>
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<td></td>
<td>Ceftriaxone (50 mg/kg per day IM or IV for 1 to 3 d)</td>
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<tr>
<td></td>
<td>Tympancentesis*</td>
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<td>Consult specialist**</td>
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*IM, intramuscular; IV, intravenous

* Should be considered in patients who have received amoxicillin in the previous 30 d or who have the otitis–conjunctivitis syndrome.

**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.

From the American Academy of Pediatrics  Pediatrics Vol. 133 No. 2 February 1, 2014

*Please note this table has been updated to reflect a correction to Ceftriaxone dosing as noted in February 1, 2014 publication.
Preventing and Treating Ear Infections

What is an ear infection?

**Ear infections can affect the ear canal or the middle ear.**

**Acute otitis externa (AOE)** is the scientific name for an infection of the ear canal, which is also called swimmer’s ear.

Middle ear infections are called **Otitis Media**, and there are two types of middle ear infections:

- **Otitis Media with Effusion (OME)** occurs when fluid builds up in the middle ear without pain, pus, fever, or other signs and symptoms of infection.
- **Acute Otitis Media (AOM)** occurs when fluid builds up in the middle ear and is often caused by bacteria, but can also be caused by viruses.

How are ear infections caused and how can they be prevented?

**Bacteria**

AOM is often caused by bacteria, and *Streptococcus pneumoniae* is a common bacterial cause of AOM.

- Ensure your child is up to date on vaccinations, including the pneumococcal vaccination which protects against *Streptococcus pneumoniae*. Breast feeding exclusively until your baby is 6 months old and continuing to breastfeed for at least 12 months can protect your baby from infections, including AOM.

**Cold and Flu Season**

AOM often occurs after a cold. Viruses cause OME (fluid in the middle ear), and then bacteria can grow in the fluid leading to AOM.

- Ensure your child is up to date on vaccinations and gets a flu vaccine every year.

**Injury to the Ear**

Foreign objects, like cotton swabs and bobby pins, can cause cuts and bruises in the ear canal that can get infected, causing acute otitis externa AOE.

- Avoid putting foreign objects in the ear.

[Accessible version: https://www.cdc.gov/antibiotic-use/community/for-patients/common-illnesses/ear-infection.html]
Cigarette Smoke

Exposure to cigarette smoke can lead to more colds and more AOM.

- Avoid smoking and exposure to secondhand smoke.

Family History

The tendency to develop AOM can run in families.

- Family history is not preventable. Instead, focus on other prevention methods, like staying up to date on vaccinations, breast feeding, and avoiding smoke.

How are ear infections treated?

- **AOE** is usually treated with antibiotic ear drops.
- **OME** usually goes away on its own and does not benefit from antibiotics.
- **AOM** may not need antibiotics in many cases because the body’s immune system can fight off the infection without help from antibiotics, but sometimes antibiotics are needed.

Watchful Waiting

- Mild AOM often will get better on its own without antibiotic treatment, so your healthcare professional may recommend *watchful waiting* before prescribing antibiotics to you or your loved one. This means that your provider may wait a few days before deciding whether to prescribe antibiotics, while treating the symptoms of AOM. Watchful waiting gives your or your child’s own immune system time to fight off the infection first before starting antibiotics. If you or your child don’t get better in 2–3 days or get worse, your healthcare professional can recommend starting antibiotics.

- Another form of watchful waiting is *delayed prescribing*. This means that your healthcare professional may give you an antibiotic prescription, but ask you to wait 2–3 days to see if you or your child are still sick with fever, ear pain, or other symptoms before filling the prescription.

Symptom Relief

There are ways to relieve symptoms associated with ear infections – like ear pain – whether or not antibiotics are needed. Consider using acetaminophen or ibuprofen to relieve pain or fever. Ask your healthcare professional or pharmacist what medications are safe for you or your loved one to take.

Antibiotics, such as amoxicillin, are used to treat severe ear infections or ear infections that last longer than 2–3 days.

If your child has a fever of 102.2°F (39°C) or higher, discharge or fluid coming from the ear, symptoms are much worse, or symptoms last for more than two or three days for AOM, you should contact your healthcare professional. If your child has symptoms of OME for more than one month or hearing loss, contact your healthcare professional.
References (List is not inclusive)

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   http://pediatrics.aappublications.org/content/133/2/346.4

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