



OTITIS MEDIA

Evans Army Community Hospital Practice Guideline Pediatric Service... "Kids Are Our Business"



Middle ear infections (otitis media) are the most common medical problem in children in the United States. Otitis media occurs most frequently in infants and toddlers. The infection is usually preceded by upper respiratory symptoms such as a cold or allergies. It causes inflammation and accumulation of fluid in the middle ear which is located behind the ear drum. In 1990, there were 12.8 million episodes in children under five across the United States. Seventeen percent of children under two will have recurrent disease. In addition to the accompanying pain and fever, otitis media is a significant problem in the U.S. for these reasons:

- **Temporary Hearing Loss and Delay in Speech and Language Skills:**
Persistent and recurrent ear infections cause temporary hearing loss and can delay the acquisition of speech and language skills. This is particularly a problem for infants and toddlers who are the most likely to suffer ear infections at critical stages in language development.
- **Increasing Incidence:**
Otitis media is being diagnosed more frequently than ever before. The incidence of office visits for this condition increased 224 percent between 1975 and 1990 in children under two, and 150 percent in children under 15.
- **High Costs:**
\$3.5 billion was attributed to direct and indirect costs for otitis media in 1989 alone.
- **Variations in Quality of Care:**
There are significant uncertainties regarding the best management of otitis media, and significant variations in how physicians treat the condition. As a result, it is unclear to many physicians and patients what constitutes the best care.

This guideline suggests:

1) More accurate physical examination:

This guideline encourages more accurate diagnosis through pneumatic otoscopy. The key finding necessary to make the diagnosis of otitis is the presence of fluid in the middle ear. This guideline recommends that in addition to inspecting the eardrum, the practitioner should attempt to move the eardrum by pushing air against it. If fluid is present, the eardrum will not move normally. This non-invasive maneuver will improve the accuracy of the diagnosis to differentiate children who need treatment from those who do not.

2) Use of traditional, inexpensive antibiotics

This guideline recommends traditional, inexpensive "narrow spectrum" antibiotics which can be as effective as "broad spectrum" antibiotics, but have fewer potential side effects. Recent studies show that the newer broad spectrum antibiotics offer no advantages over the less expensive antibiotics except when others have failed and infections are recurrent. Additionally, restrictive use of the newer antibiotics will retard the development of resistant organisms; the development of these organisms will compound the difficulties of treating otitis in children.

3) Appropriate timing of surgical evaluation for children with severe infections:

This guideline includes clear recommendations about when children with persistent fluid need surgical evaluation. Practice variation in the timing of referral can result in premature surgery for some children, while others are referred too late and suffer unnecessary discomfort or temporary hearing loss. Some children seem to clear their infections quickly only to experience another soon thereafter. The guideline recommends specific timing of surgical referral for recurrent infections and further stresses the use of preventive antibiotics before surgical evaluation or intervention after surgical evaluation.

2) Increased testing for hearing loss:

Adapted from:

Vermont Program for Quality in Healthcare; American Academy of Pediatrics Practice Guidelines: CDC Recommendations
November 1999

This guideline encourages increased testing for hearing loss and appropriate use of this information in the management of ear problems. Too few practitioners test for hearing loss and, as a result, some children who require more aggressive treatment are not identified. Additionally, some children are treated too aggressively despite the fact that their hearing has not been affected by otitis.

5) Clear indications for surgery:

For children who are evaluated by a surgical specialist, the guideline gives clear indications for the need of surgical intervention.

6) A one month interval between diagnosis and routine follow-up for low-risk children:

This guideline recommends tailoring the frequency of follow-up visits to the risk for ongoing disease. An effective schedule for routine follow-up which maintains quality health care is suggested.

Otitis media is obviously significant to the children and families who experience it and are exposed to its pain and potential effects on speech and language skills. Use of this guideline offers the opportunity to improve the quality of care and decrease its cost.

Clinical Guideline

There is no single best way to treat every child with otitis, nor is it possible to address all the nuances that pertain to any patient management approach. This guideline puts forth a “best practice” that applies to most children most of the time; it is advisory in nature and must be followed in a flexible manner based upon the particular facts and circumstances of the situation presented. The ultimate judgment regarding the propriety of any specific procedure must be made by the responsible practitioner in light of the individual circumstances presented by the patient.

This guideline is designed for the management of otitis media in the otherwise healthy child, not for children with craniofacial or neurologic abnormalities, sensory defects, nor those who are immunocompromised. Although preventive strategies are not discussed, the incidence of otitis media may be decreased by breast-feeding of infants, smaller daycare settings or home care, and avoidance of tobacco smoke exposure.

This guideline begins with a child presenting with signs of otitis. Although a recent study revealed that many children have no specific symptoms; earache, rubbing the ear, the feeling of a blocked ear, behavioral changes, and hearing loss are common signs of otitis media.

Acute Otitis Media

Acute otitis media (AOM) is characterized by decreased mobility of the tympanic membrane (TM) and either reddened, bulging, or opaque appearance of the TM; or by purulent material in the ear canal. Use of pneumatic otoscopy can increase accuracy in diagnosing AOM.

Tympanometry can also be used for assessing poor TM mobility, but its use for this purpose is supported by limited scientific evidence. The positive predictive value of an abnormal tympanogram is between 49 and 99 percent; i.e., as few as half of children with abnormal tympanograms will have an effusion. The combined use of tympanometry and pneumatic otoscopy may improve diagnostic accuracy. Tympanometry gives information about TM mobility, and pneumatic otoscopy allows the examiner to visualize abnormalities of the ear canal. An abnormal tympanogram should not be accepted without direct examination of the ear.

- *Treatment*

The goals of intervention include decreasing the duration of fever and pain, expediting the resumption of normal activity, and limiting the small potential for suppurative complications such as mastoiditis or petrositis. Spontaneous cure of AOM may occur in up to 80 percent of children treated only with analgesics. Antibiotics increase the cure rate to 94 percent, and decrease the duration of symptoms and the risk of complications. Broad spectrum antibiotics usually **do not** offer advantages over standard antimicrobials.

The specific antibiotic chosen should provide the most narrow spectrum, taking into account these factors:

- History of allergy or intolerance to a particular antibiotic or class of antibiotic;
- Presumed causative organism (*Streptococcus pneumoniae* is most likely in a child previously untreated for AOM). Antibiotic exposure within the previous 30 days may have caused resistant organisms to predominate. Conjunctivitis/Otitis Syndrome is suggestive of *H. influenzae* infection;
- Compliance issues (taste, dosing regimen, storage and transport, and cost).

For children who are not allergic to penicillins, the following antibiotics are currently recommended by the AAP and CDC in order of usage:

1. Amoxicillin 80-100 mg/kg/day divided bid for 7-10 days.
2. Augmentin (amoxicillin/clavulanate) 45 mg/kg/day divided bid for 7-10 days.
3. Ceftin (cefuroxime axetil [a second generation cephalosporin]) 30 mg/kg/day divided bid.
4. Rocephin (ceftriaxone) 50 mg/kg/dose IM/IV q day for 3 days.

For penicillin allergic children, trimethoprim/sulfamethoxazole or erythromycin/sulfisoxazole are the initial choices. However, studies have indicated that as much as 90% amoxicillin/ penicillin allergic reactions are not true medicine allergic reactions. Most of these reactions are actually viral exanthems or “Amoxicillin-virus” rashes. *Note that Suprax and Azythromycin have no place in routine management of otitis media.*

- *Recurrence*

Recurrent otitis media is typically defined as three episodes within three months, four episodes within six months, or more than six within 12 months. Recurrent bouts of otitis may warrant prophylactic antibiotic regimens which include:

1. Amoxicillin 20 mg/kg/day qhs, or
2. Sulfisoxazole (Gantrisin) 50-75 mg/kg/day divided bid.

Recurrent otitis, especially when antimicrobial prophylaxis fails to reduce the frequency, severity, and duration of the disease, is an indication for tympanostomy tubes.

- *Follow-up*

Once antibiotic treatment is initiated the child should demonstrate symptomatic benefit within 72 hours. Failure to show improvement indicates need for re-evaluation. A follow-up examination should be scheduled for one month after the diagnosis and should include:

- Inspection of the tympanic membrane,
- Assessment of TM mobility, and
- Assessment of hearing.

The purpose of the follow-up exam is to identify persistent otitis media or persistent middle ear effusion. Children with persistent otitis media or persistent middle ear effusion should be seen on a monthly basis until their exam is normal. The best gauge for persistent otitis is parental judgement. Earlier post treatment follow-up is not necessary unless there is:

- Parental suspicion of persistence,
- Persistence of symptoms reported by an older child,
- A high risk situation such as children less than 15 months or family history of recurrent otitis, or
- Doubt about the accuracy of parental input.

Otitis Media with Effusion

Otitis media with effusion (OME) is characterized by fluid in the middle ear without evidence of ear infection. Pneumatic otoscopy can increase accuracy in the diagnosis; it has proven to be 70 to 79 percent accurate. Visual inspection with an otoscope is usually not sufficient to make the diagnosis. Tympanometry may be used supplementally.

A hearing evaluation should be performed in all children who have had bilateral OME for more than three months or unilateral effusion for more than six months. A hearing threshold level of 20 decibels or worse in the better hearing ear is typical of a significant deficit. Longstanding deficits of a lesser degree are also significant. Hearing screening is appropriate when effusion has been present for a shorter period of time and there is a suspected hearing deficit. Parental suspicion of hearing difficulties in a child with recurrent or persistent disease should prompt audiometric testing. Methods to determine hearing acuity will vary depending on resources available and the child's willingness and ability to participate. Optimally, air- and bone-conduction testing should be established for a range of frequencies between 500 and 4,000 Hz. These results should be verified by obtaining a measure of speech sensitivity. Determinations of speech reception or speech awareness thresholds alone may be used if the child cannot cooperate for pure tone testing. If none of these test techniques are available or tolerated, examiners should use their best judgement as to the hearing adequacy. Achievement of developmental milestones for verbal communication should also be surveyed.

- *Treatment*

Most cases of OME resolve spontaneously. A 14 percent increase in resolution rate has been demonstrated in studies on the use of antibiotics; length of treatment was typically ten days. The small improvement in resolution rate needs to be weighed against potential side effects, cost, and development of antimicrobial resistance. Antihistamine/decongestant therapies are not recommended for the treatment of OME; and, based on limited data regarding their use, steroids are not recommended.

- *Chronic OME*

Tympanostomy tube placement should be considered for children who have OME that is unresponsive to medical management and has persisted for three months when bilateral or six months when unilateral. The presence of any of the following support the need for surgical evaluation:

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| Significant hearing loss; | Disequilibrium/vertigo; and/or |
| Speech/language delay; | Tinnitus. |
| A severe retraction pocket; | |

Ear Pain with Normal Physical Exam

In the event of a normal exam and if symptoms continue, a follow-up visit is appropriate. Other causes of ear pain such as eustachian tube dysfunction or temporomandibular joint pain should then be considered.

ENT Referral

Indications for the insertion of tympanostomy tubes include:

- Chronic otitis media with effusion particularly when accompanied by a hearing deficit;
- Recurrent otitis media despite antimicrobial prophylaxis;
- Suspicion or presence of a suppurative complication such as meningitis or mastoiditis; or
- Eustachian tube dysfunction, even in the absence of middle ear effusion, when the child has persistent/recurrent signs and symptoms that are not relieved by medical treatment options. Signs and symptoms would include fluctuating hearing loss, disequilibrium/vertigo, tinnitus, or a severe retraction pocket.