

ACUTE OTITIS MEDIA

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Overview^{1-3,5}

Acute otitis media is defined as the presence of inflammation in the middle ear accompanied by rapid onset of signs and symptoms of an otalgia and decreased hearing. General management is usually based on patient age and severity of infection. The majority of cases occur in children under the 6 years of age, and these can usually be managed without antibiotics as long as appropriate follow-up can be provided. Spontaneous resolution is seen in 80-90% of children. Decongestants, antihistamines, and steroids are not proven to be beneficial and are not recommended in children. In comparison, the mainstay of treatment for uncomplicated OM in adults is antibiotics.

Diagnostic Considerations

Risk Factors:

- Major: viral infections, such as colds and flu (usually due to inflammation of the Eustachian tube)
- Minor: environmental tobacco smoke, daycare attendance, pacifier use and bottle feeding in the supine position, orofacial abnormalities, immunodeficiency, children of First Nations or Inuit ethnicity
- **Breastfeeding during the first 6 months may be protective

Pathogens:

- S. pneumonia (most important bacterial cause in adults)
- H. influenzae
- Less frequently Group A strep, S aureus, M catarrhalis

Signs and Symptoms

- Specific: otalgia, decreased hearing, a loss of landmarks on otoscope examination, and an opaque, bulging, and inflamed tympanic membrane; poor mobility with pneumatic pressure application; purulence in external canal if TM rupture.
- Non-specific: irritability, fever, night-waking, poor feeding, cold symptoms and conjunctivitis

Management Considerations

- Management varies depending on age (see pharmacology table below)
- Watchful waiting may be employed in children
- In adults, antibiotic treatment should be started immediately; if no improvement in 48-72hrs, patient should be re-examined as there may be a new focus of infection or inadequate therapy

Pharmacologic Management of AOM for Children over 6 Months of Age and Adults^{1-3,5}

Patient Type	Medication	Dose (Children)	Dose (Adults)	Comments
Otherwise healthy with mild symptoms	Acetaminophen (Tylenol®) OR	10-15mg/kg/dose PO q4hrs prn (max 75mg/kg/day)	Watchful waiting is not an option for adults, although acetaminophen and Advil may be used to concomitantly manage fever and pain.	<6mths: AOM is extremely difficult diagnosis; if the diagnosis is certain, initiate antibiotics immediately 6-24mths: observation for 48-72 hrs with systemic analgesics is sufficient in selected children with uncomplicated AOM and assurance of follow-up >24mths: most cases resolve spontaneously; ensure symptoms are manageable with systemic analgesics and child has access to reevaluation at 48hrs
	Ibuprofen (Advil® / Motrin®)	5-10mg/kg/dose PO q6hrs prn (max 40mg/kg/day)		
<i>Consider antibiotics if: 1) moderate to severe pain with fever >39°C, bilateral AOM, systemic features such as vomiting, or severe local signs (i.e. perforation with purulent discharge; 2) symptoms do not resolve in 2-3 days; 3) symptoms worsen or new symptoms appear (rash, vomiting, difficulty breathing)</i>				
Without tympanic membrane rupture	Amoxicillin	80mg/kg/day divided BID or TID	500mg TID	Maximum dose of amoxicillin is 3g/day.
	Amoxicillin-clavulanate	40mg/kg/day divided TID	500mg TID or 875mg BID	4:1 formula. Dose based on amoxicillin content May be used as first-line or if amoxicillin failure
	Cefuroxime axetil	30mg/day divided BID	250-500mg BID	Recommended for non-anaphylactic penicillin allergy; due to poor taste, recommend tablets, which can be crushed and added to palatable foods May be used if amoxicillin failure
	TMP/SMX	5-10mg/kg/day of TMP divided BID	2 tabs BID or 1 DS tab BID	TMP/SMX are inferior options due to high resistance rates
	Clarithromycin	15mg/kg/day divided BID	250-500mg BID	Recommended for anaphylactic penicillin allergy or cephalosporin allergy
	Azithromycin	10mg/kg/day on first day, then 5mg/kg/day x4 days	500mg od x1 day, then 250mg od x4 days	
Tympanic membrane perforation or ventilation tubes	Ciprodex (otic suspension)	4 drops BID x 5 days	4 drops BID x5days	Contains 3mg of ciprofloxacin and 1mg of dexamethasone per mL

Special Considerations

Otitis Media with Tympanic Membrane Perforation^{1,5}

- May use topical agents alone or in addition to oral antibiotics if there is evidence of systemic illness (such as fever)
- Avoid topical agents with aminoglycosides/alcohol to prevent ototoxicity
- Prevention of water entry into canal is important

Otitis Media with Effusion^{1,2,5,6}

Otitis media with effusion (OME) is defined as the presence of fluid in the middle ear without signs and symptoms of an acute ear infection, and should be distinguished from AOM (acute onset, purulent middle ear infection and inflammation).

- May occur as an inflammatory response following an episode of AOM or spontaneously due to poor Eustachian tube function (post-URI, seasonal allergies, airplane travel)
- Even after treatment of AOM, sterile middle ear effusions may persist for up to 1 month in 50% of children and up to 3 months in 30% of children
- Children may also experience transient hearing loss

Most effusions will resolve over 12 weeks with no intervention necessary:

- Does not require antibiotic treatment
- Decongestants, antihistamines and steroids are not recommended (although decongestants may offer symptomatic relief in adults)
- Discontinuing exposure to passive smoking is the single most effective modifiable risk factor
- Follow-up is recommended at 3 month intervals until the effusion has resolved
- Referral to an otolaryngologist recommended in the presence of significant hearing loss or structural abnormalities of the tympanic membrane.

Complications of Acute Otitis Media⁴

- Meningitis
- Mastoiditis
- Facial weakness or paralysis
- Vertigo
- Hearing loss
- Post-auricular swelling

Indications for Referral to Otolaryngology⁴

- Any suspected complication (as listed above)
- Severe signs and symptoms (high fever, intractable pain) despite adequate antibiotic therapy
- Recurrent infections (four in 1 year or three in 6 months)
- Recurrent infections with colonization with multi-drug resistant bacteria
- Suspicion of cholesteatoma
- All children with cleft palate, Down syndrome or craniofacial malformations
- Persistent TM perforation (> 6weeks) with or without suppurative drainage
- Chronically draining (chronic suppurative otitis media); may consider swabbing for possible candida and aspergillus species

References can be found online at http://www.dfc.utoronto.ca/programs/postgraduateprograme/One_Pager_Project_References.htm