

Current Acute Otitis Media Recommendations

Acute otitis media (AOM) is most common in infants and preschool children. In a Saskatchewan study of preschool children, AOM was responsible for 33% of visits and 39% of antibiotic prescriptions. 80% of the children with AOM were prescribed antibiotics.¹

Most Common Pathogens^{1,2}

S. pneumoniae is the most common infecting organism (40-50% of AOM)

- least likely to go away without antibiotics (only 20% spontaneously resolve)
- increasingly resistant to penicillin, cephalosporins, TMP/SMX, and macrolides (including clarithromycin and azithromycin)
- more likely resistant if <2yo, in daycare, given antibiotics in past 3 mts, and if siblings have taken repeated courses of antibiotics
- drug resistant S. pneumoniae is more common in children than in adults

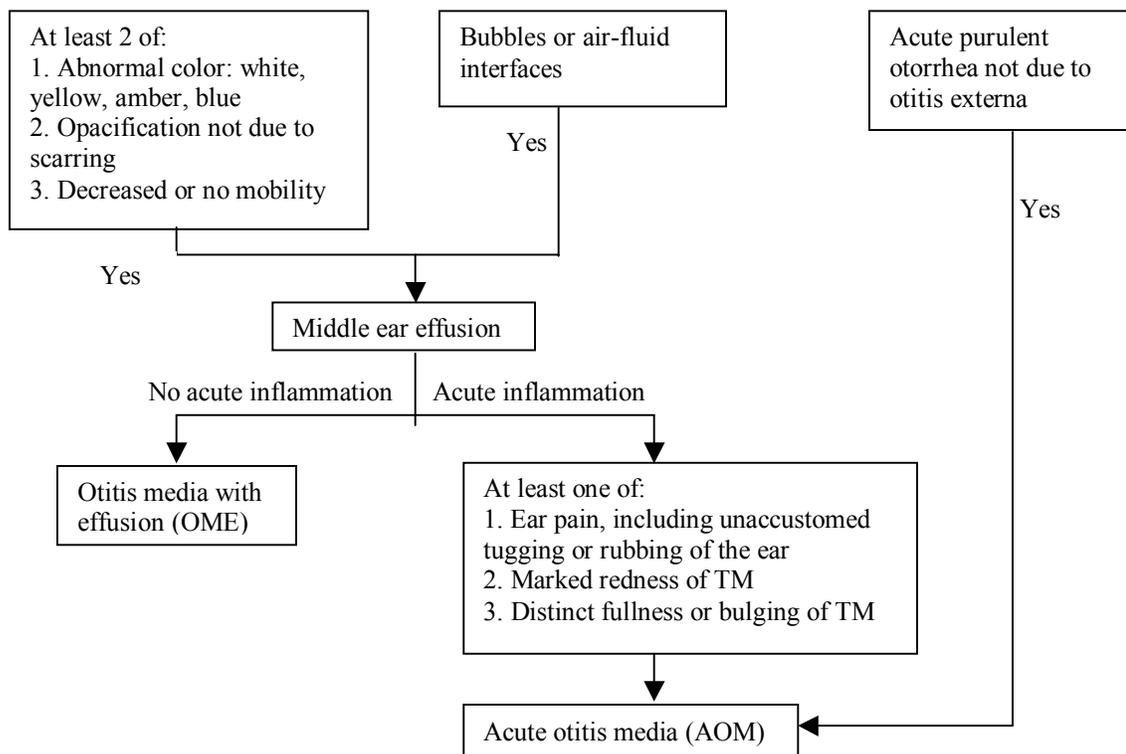
H. influenzae is the 2nd most common organism (20-25% of AOM)

- 50% resolve spontaneously
- resistance (due to beta-lactamase producers) is increasing
- increasing TMP/SMX resistance

M. catarrhalis is the 3rd most common organism (10-15% of AOM)

- almost all produce beta-lactamase
- increasing resistance to TMP/SMX

Acute Otitis Media versus Otitis Media with Effusion²



Treatment Recommendations^{1,2}

Child	Comments	First Choice	If treatment failure on Day 3	If treatment failure on Day 10-28
<1 month old	Check for bacteremia; AOM often caused by gram -	Refer	If initial therapy fails, check compliance	
<2 years old no antibiotic in prior month	Treat most cases for 10 days	High dose amoxil	High dose amoxil/clav or cefprozil or IM ceftriaxone for 3 days	High dose amoxil/clav or cefprozil or IM ceftriaxone for 3 days
<2 years old antibiotic in prior month	Treat most cases for 10 days	High dose amoxil/clav	IM ceftriaxone for 3 days; consider tympanocentesis	High dose amoxil/clav or cefprozil or IM ceftriaxone for 3 days; consider tympanocentesis
>2 years old not frequent AOM and no antibiotic in prior month	Consider watchful waiting* for 2-3 days; maximum 5 days of antibiotics (5 days is as effective as 10 days and reduces cost and exposure to antibiotics)	High dose amoxil	High dose amoxil/clav or cefprozil or IM ceftriaxone for 3 days	
> 2 years old antibiotic in prior month	Verify AOM vs OME; consider watchful waiting* for 2-3 days; maximum 5 days of antibiotics	High dose amoxil/clav		
Any age frequent AOM	Verify AOM vs OME (<i>see previous page</i>); treat AOM for 10 days ; consider Prevnar if <5 yrs old; give influenza vaccine every year for all ages	High dose amoxil/clav	IM ceftriaxone for 3 days; consider tympanocentesis	High dose amoxil/clav or cefprozil or IM ceftriaxone for 3 days
Penicillin Allergy	Verify that allergy is anaphylactic-type allergy: hives, wheezing, ↓ blood pressure, swollen lip, mouth or throat	Clarithromycin or azithromycin (do not use if <3 yrs old and high fever because child is at risk of occult S.pneumoniae bacteremia, therefore use clindamycin)	Tympanocentesis	Clarithromycin or azithromycin (do not use if <3 yrs old and high fever, use clindamycin); consider tympanocentesis

Pain Relief: Acetaminophen is the treatment of choice, but ibuprofen is an effective alternative

When to Refer: Refer to otolaryngologist for recurrent AOM (≥ 3 episodes in 6 months or ≥ 4 episodes in 1 year) or children with middle ear fluid that lasts longer than 3 months (to evaluate chronic OME and get hearing tests)

Surgical Options: 2 main indications for myringotomies and tympanotomy tubes are: chronic OME (fluid in ear for >3 months and hearing loss) or recurrent AOM (≥ 3 episodes in 6 months or ≥ 4 episodes in a year)

Aspiration of middle ear fluid: Rarely needed. May be useful in immunocompromised patients or if complications due to AOM

Follow Up for AOM: 2 weeks after starting empiric therapy, 80% still have middle ear effusion (making ear drum look abnormal), so it is important not to treat children who look and feel better but have an abnormal looking ear drum on follow up. Avoid follow up for at least 30 days in children who do not have pain to avoid misdiagnosing AOM as OME.

* **Watchful Waiting**¹: Approximately 80% of AOM cases spontaneously resolve with no drug therapy. With antibiotic treatment 95% of cases resolve. For every 7 children treated with antibiotics, only one will benefit.

Consider watchful waiting if child is at low risk of serious complications:

- >2 years old
- mild and/or unilateral AOM
- no toxicity or severe pain
- late presentation (ie. 36 hrs and mild or improving)
- no otorrhea
- no history of chronic or recurrent AOM
- available for follow-up

Drug Therapy^{1,2,3}

Drug	Dose	Adverse Effects	Comments
Amoxicillin (high dose)	80-90 mg/kg/day divided BID-TID	- well tolerated - occasionally causes diarrhea - maculopapular rash uncommon, but hard to distinguish from concomitant viral infection	- drug most active against <i>S. pneumoniae</i> - >78% of <i>S.pneumoniae</i> are penicillin sensitive, and 57% of <i>H. influenzae</i> are beta-lactamase negative - high dose amoxi covers most <i>S.pneumoniae</i> and <i>H. influenzae</i> (active against penicillin resistant <i>S.pneumoniae</i>) - only use low dose amoxil of child is at low risk of resistance (ie. no siblings, rarely in contact with other children, no antibiotic in month prior) - when writing high dose formulations, good to write "high dose" on Rx to avoid confusion - inexpensive
Amoxicillin/Clav (high dose) (CLAVULIN)	80-90 mg/kg/day divided BID-TID of amoxicillin	- diarrhea common (related to the amount of clavulanate)	- active against most bacteria likely to cause AOM - clavulin is active against beta-lactamase producers like <i>H.influenzae</i> , but does not increase coverage of penicillin resistance <i>S.pneumoniae</i> - formulations with higher amoxil/clav ratio (ie. 7:1) cause less diarrhea - DO NOT use older formulations Clavulin-125F and Clavulin-250F in high dose because they are much more likely to cause diarrhea
Cefprozil (CEFZIL)	30mg/kg/day divided BID	- little diarrhea or GI upset	- liquid tastes good - more active than cefuroxime against <i>S. pneumoniae</i> and it is absorbed better
Ceftriaxone (ROCEPHIN)	50mg/kg (max 1g) IM in 24 hrs	- can use 1% plain lidocaine as a diluent to reduce pain at injection site	- effective in AOM, even in areas with high penicillin resistant <i>S.pneumoniae</i>
Clindamycin (DALACIN)	30-40 mg/kg/day divided TID	- diarrhea common	- use if true allergy to penicillin and if <3 yrs old with high fever - does not cover <i>H. influenzae</i> or <i>M. catarrhalis</i>
Azithromycin (ZITHROMAX)	Day1: 10mg/kg Day 2-5: 5 mg/kg give OD at bedtime	- little diarrhea or GI upset	- drug resistant <i>S. pneumoniae</i> is more likely to be resistant to macrolides than penicillin - liquid tastes good - use if true penicillin allergy, but not if <3 yrs old with high fever
Clarithromycin (BIAXIN)	15mg/kg/day divided BID; take suspension with food or juice to mask bitter aftertaste	- diarrhea/ vomiting (15%)	- use if true penicillin allergy, but not if <3 yrs old with high fever - drug resistant <i>S. pneumoniae</i> is more likely to be resistant to macrolides than penicillin

Comments:

- **TMP/SMX** (BACTRIM, SEPTRA) has a limited role. It can be an alternative in penicillin allergic patients, but there is increasing resistance (in Saskatchewan, *S. pneumoniae* resistance to TMP/SMX is 40% and in Canada, beta-lactamase producing *H. influenzae* resistance to TMP/SMX is 13.7%)
- **Erythromycin** is not active against *H.influenzae*
- **Cephalexin** (KEFLEX) should not be used in AOM
- **Cefuroxime axetil** (CEFTIN) is a poor choice for AOM because it is poorly absorbed and at least 1/3 of penicillin resistant *S.pneumoniae* are very resistant to cefuroxime

References:

- 1 Rx files: Acute Otitis Media Antibiotic Treatment Considerations. February 2001
2. Gray, J. Therapeutic Choices. 4th ed. Canadian Pharmacists Association. 2003.
3. Rx files: Drug Comparison Chart. September 2004