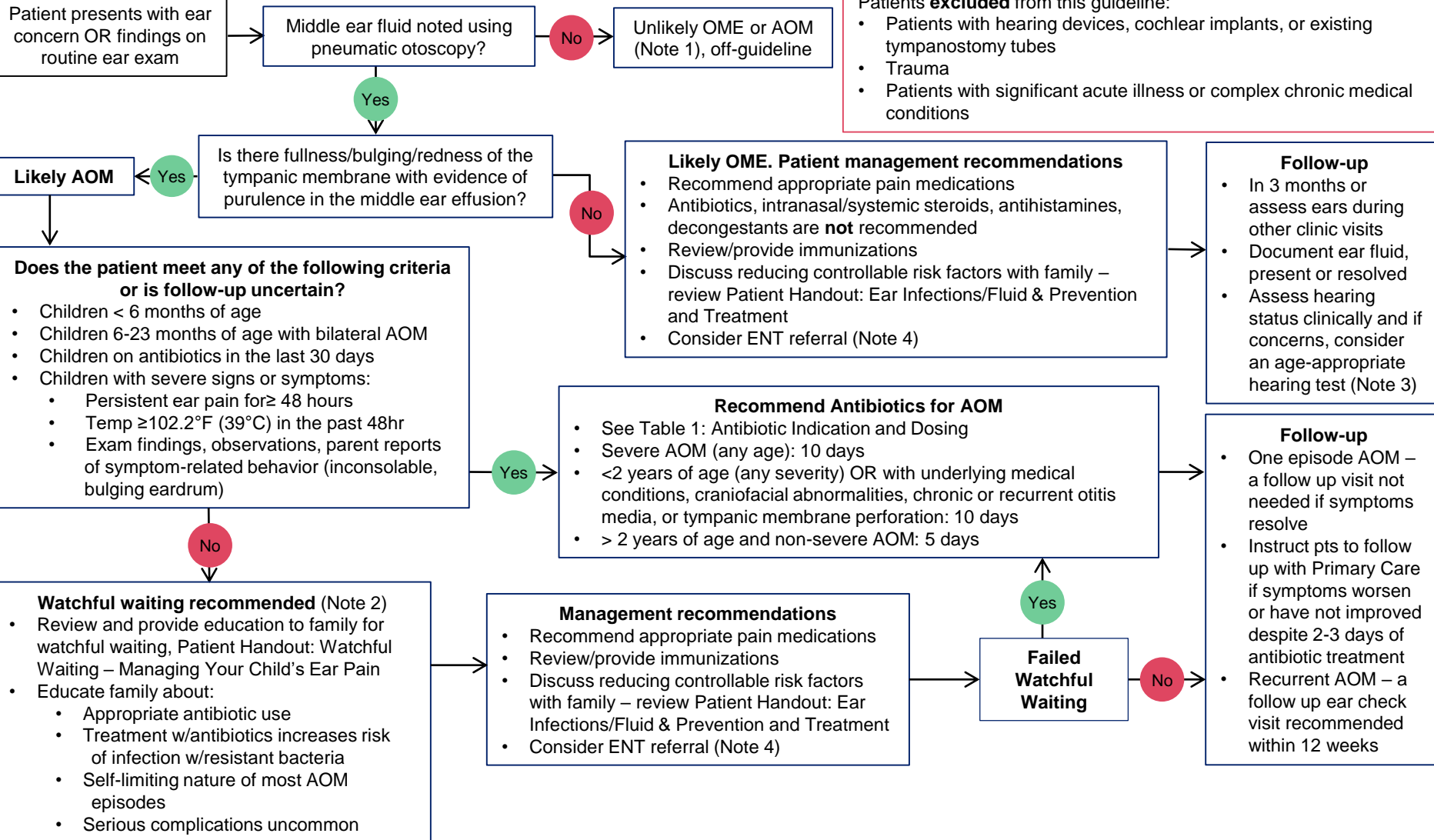


Aim: To reduce unwarranted antimicrobial use in patients with uncomplicated otitis media

EXCLUSION GUIDELINES

Patients **excluded** from this guideline:

- Patients with hearing devices, cochlear implants, or existing tympanostomy tubes
- Trauma
- Patients with significant acute illness or complex chronic medical conditions

**Likely OME. Patient management recommendations**

- Recommend appropriate pain medications
- Antibiotics, intranasal/systemic steroids, antihistamines, decongestants are **not** recommended
- Review/provide immunizations
- Discuss reducing controllable risk factors with family – review Patient Handout: Ear Infections/Fluid & Prevention and Treatment
- Consider ENT referral (Note 4)

Follow-up

- In 3 months or assess ears during other clinic visits
- Document ear fluid, present or resolved
- Assess hearing status clinically and if concerns, consider an age-appropriate hearing test (Note 3)

Recommend Antibiotics for AOM

- See Table 1: Antibiotic Indication and Dosing
- Severe AOM (any age): 10 days
- <2 years of age (any severity) OR with underlying medical conditions, craniofacial abnormalities, chronic or recurrent otitis media, or tympanic membrane perforation: 10 days
- > 2 years of age and non-severe AOM: 5 days

Follow-up

- One episode AOM – a follow up visit not needed if symptoms resolve
- Instruct pts to follow up with Primary Care if symptoms worsen or have not improved despite 2-3 days of antibiotic treatment
- Recurrent AOM – a follow up ear check visit recommended within 12 weeks

Management recommendations

- Recommend appropriate pain medications
- Review/provide immunizations
- Discuss reducing controllable risk factors with family – review Patient Handout: Ear Infections/Fluid & Prevention and Treatment
- Consider ENT referral (Note 4)

**Failed
Watchful
Waiting**

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NOTE 1. Definitions

- Acute otitis media: Clinical symptoms of pain and or fever is usually present plus exam findings of acute inflammation of the middle ear
- Otitis media with effusion (OME) or ear fluid: Presence of fluid in the middle ear without signs or symptoms of acute ear infection
- Chronic OME: OME persisting for over 3 months from the date of onset (if known) or from the date of diagnosis
- Middle ear effusion (MEE): Fluid in the middle ear from any cause. Middle ear effusion can be present with both OME and acute otitis media (AOM) and may persist after the acute signs and symptoms of AOM resolve

NOTE 2. Watchful Waiting Recommendations

Offer observation and pain management for 48-72 hours with close follow-up (watchful waiting), on the basis of shared decision making with the parent or caregiver for:

- Children 6-23 mo w/out severe signs and symptoms or otorrhea and with unilateral AOM
- Children ≥ 2 years of age without severe symptoms or otorrhea (with unilateral or bilateral AOM)
- If watchful waiting pursued, may offer antibiotic prescription and counsel family to observe for 2-3 days. If symptoms do not improve or worsen, antibiotic can be filled
- If antibiotic prescription filled, request that parents send portal message or call during clinic hours to document antibiotic was used

The following patients should receive immediate antibiotic treatment (watchful waiting is not recommended):

- Children <6 mo
- Children 6 -23 mo w/ bilateral AOM regardless of severity
- Children ≥ 6 mo w/ otorrhea or severe signs and symptoms (toxic appearing child, temperature $\geq 39^{\circ}\text{F}$ [102.2°F], ear pain for ≥ 48 hours, or moderate to severe ear pain)
- Patient has uncertain access to follow-up

Children with existing tympanostomy tubes or cochlear implants are excluded from this guideline and these watchful waiting recommendations.

NOTE 3. Consider Audiology Referral for AOM or OME:

- For hearing assessment ≥ 3 months of MEE or recurrent AOM, especially w/speech delay or other risk factors
- If middle ear status and ear drum condition cannot be determined with certainty to correlate microscope exam, audiogram and tympanograms.

NOTE 4. May Consider ENT Referral for AOM or OME:

- For OME without AOM if middle ear fluid present after 4-6 months or more of monitoring AND patient exhibits:
 - Hearing threshold > 30 dB AND/OR
 - Speech or hearing concerns
 - If there is a speech delay, hearing testing is recommended to determine if speech delay might be related to hearing loss.
- For recurrent AOM of ≥ 3 separate AOM episodes in 6 mo OR at least 4 well-documented and separate AOM episodes in 12 mo w/ at least 1 in last 6mo AND evidence of MEE in one or both ears at most recent assessment.

*CHN Otitis Media Guideline Maintenance Workgroup acknowledges the 2022 OHS Guideline for ENT to offer ear tube insertion for recurrent AOM with MEE but continues to encourage a moderate approach to ENT referral for ear tube insertion due to the lack of strong evidence supporting the benefits of early ear tube insertion while balancing the low risk of harm to the patient from slightly longer observation periods and the combined risks of surgery & ear tube complications.

- Resistant AOM that does not respond to multiple courses of oral antibiotics or requires IM ceftriaxone therapy
- Speech or language delay
- When approaching the spring months consider longer primary care monitoring prior to an ENT referral (reduced viral exposure during summer months)
- If a cholesteatoma or structural abnormality of middle ear is suspected, immediate referral to ENT is recommended (Isaacson, 2018)

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Table 1: Antibiotic Indication and Dosing

Antibiotic	Indication	Dose	Duration
Amoxicillin	First-line for AOM	90 mg/kg/day PO in 2 divided doses (max: 2000 mg/dose)	<ul style="list-style-type: none"> Severe AOM (any age): 10 days <2 years of age (any severity): 10 days ≥2 years of age and non-severe AOM: 5 days
Amoxicillin-clavulanate	Second line: Patients with AOM who received amoxicillin in the last 30 days, or have concurrent purulent conjunctivitis, or have history of recurrent AOM unresponsive to amoxicillin	90 mg/kg/day of amoxicillin and 6.4 mg/kg/day of clavulanate (14:1 formulation) PO in 2 divided doses (max: 2000 mg of amoxicillin/dose)	<ul style="list-style-type: none"> Severe AOM (any age): 10 days <2 years of age (any severity): 10 days ≥2 years of age and non-severe AOM: 5 days
Cefdinir	Patients with AOM and NON-severe penicillin allergy	14 mg/kg/day PO in two divided doses (max: 300 mg/dose)	<ul style="list-style-type: none"> Severe AOM (any age): 10 days <2 years of age (any severity): 10 days ≥2 years of age and non-severe AOM: 5 days
Cefprozil**	Patients with AOM and NON-severe penicillin allergy	30 mg/kg/day PO in two divided doses (max: 500 mg/dose)	<ul style="list-style-type: none"> Severe AOM (any age): 10 days <2 years of age (any severity): 10 days ≥2 years of age and non-severe AOM: 5 days
Clindamycin**	Patients with AOM and SEVERE penicillin allergy**	30 mg/kg/day PO in three divided doses (max: 600 mg/dose) (For challenges with oral administration due to taste, try ordering grape flavored liquid version or child can try taking with chocolate syrup or sucking on ice/popsicle prior to administration or identifying pharmacy for improved formulation)	<ul style="list-style-type: none"> Severe AOM (any age): 10 days <2 years of age (any severity): 10 days ≥2 years of age and non-severe AOM: 5 days
Ceftriaxone	a) Can be considered as initial therapy only if persistent vomiting or not tolerating oral medications, even when taste is masked. b) Can be considered if amoxicillin-clavulanate or oral cephalosporin failure.	50 mg/kg IM (max 1000 mg/dose) per day	a) 1 day b) 3 days

*Insurance coverage and availability of cefprozil in community pharmacies may be variable.

*Although amoxicillin and cefprozil share an R1 side-chain, structurally-similar cephalosporins may be administered normally to a patient with NON-severe penicillin allergy (AAAI, 2022).

**Severe penicillin allergy: Severe penicillin allergy includes any of the following: anaphylaxis, angioedema, cardiac arrest, respiratory distress, severe cutaneous reaction (e.g., Stevens-Johnson syndrome, erythema multiforme, DRESS and TEN).

NOTES: •Antibiotic recommendations do not differ based on vaccination status.

• Most pathogens causing AOM are not susceptible to azithromycin or trimethoprim-sulfamethoxazole.

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Recommendations for Initial Antibiotic Treatment Failure:

- No clinical improvement of the following symptoms (after 48 to 72 hours of amoxicillin) may indicate a need for an antibiotic change (AAP, 2013):
 - A temperature of 102.2 F if present, has not decreased
 - Irritability or fussiness that has not decreased
 - Sleeping and drinking patterns have not improved
- Recommended Antibiotic Change:
 - Amoxicillin – clavulanate
 - Monotherapy with oral cephalosporins is not included as an option for antibiotic failure in the 2013 AAP acute otitis media guideline.
 - According to the 2013 AAP guideline, in vitro susceptibility of *S pneumoniae* to cefdinir and cefuroxime is 70% to 80%, compared with 84% to 92% for amoxicillin.
- Recommendations for Amoxicillin-clavulanate or Oral Cephalosporin Failure:
 - Consider intramuscular ceftriaxone (Table 1).
 - If not responding, consider ENT referral.

Table 2: Recommendations for initial therapy and antibiotic failure

	Initial therapy	Antibiotic failure
First line	Amoxicillin PO	Amoxicillin-clavulanate PO
Non-severe PCN allergy	Cefdinir PO or cefprozil PO	Ceftriaxone IM x 3 days
Severe PCN allergy	Clindamycin PO	Consult ID
Unable to tolerate PO	Ceftriaxone IM x 1 day	Ceftriaxone IM x 3 days
Patient received amoxicillin in past 30 days or has concurrent purulent conjunctivitis	Amoxicillin-clavulanate PO	Ceftriaxone IM x 3 days

References:

1. Bajorski, P., Fuji, N., Kaur, R., & Pichichero, M. (2022). Window of Susceptibility to Acute Otitis Media Infection. *Pediatrics*.151(2). <https://doi.org/10.1542/peds.2022-058556>
2. Frost, H. M., Bizune, D., Gerber, J. S., Hersh, A. L., Hicks, L. A., & Tsay, S. V. (2022). Amoxicillin Versus Other Antibiotic Agents for the Treatment of Acute Otitis Media in Children. *The Journal of pediatrics*, 251, 98–104.e5. <https://doi.org/10.1016/j.jpeds.2022.07.053>
3. Frost, H. M., Gerber, J. S., & Hersh, A. L. (2019). Antibiotic Recommendations for Acute Otitis Media and Acute Bacterial Sinusitis. *The Pediatric infectious disease journal*, 38(2), 217. <https://doi.org/10.1097/INF.0000000000>
4. Hoberman, A., Preciado, D., Paradise, J. L., Chi, D. H., Haralam, M., Block, S. L., Kearney, D. H., Bhatnagar, S., Muñoz Pujalt, G. B., Shope, T. R., Martin, J. M., Felten, D. E., Kurs-Lasky, M., Liu, H., Yahner, K., Jeong, J. H., Cohen, N. L., Czervionke, B., Nagg, J. P., Dohar, J. E., ... Shaikh, N. (2021). Tympanostomy Tubes or Medical Management for Recurrent Acute Otitis Media. *The New England journal of medicine*, 384(19), 1789–1799. <https://doi.org/10.1056/NEJMoa2027278>
5. Kaur, R., Morris, M., & Pichichero, M. E. (2017). Epidemiology of Acute Otitis Media in the Postpneumococcal Conjugate Vaccine Era. *Pediatrics*, 140(3), e20170181. <https://doi.org/10.1542/peds.2017-0181>
6. National Institute for Health Care Excellence Public Health England (NICE). (2022). Otitis media (acute): antimicrobial prescribing. *NICE guideline* [NG91]. <https://www.nice.org.uk/guidance/ng91>
7. Parker, D. M., Schang, L., Wasserman, J. R., Viles, W. D., Bevan, G., & Goodman, D. C. (2016). Variation in Utilization and Need for Tympanostomy Tubes across England and New England. *The Journal of pediatrics*, 179, 178–184.e4. <https://doi.org/10.1016/j.jpeds.2016.08.093>
8. Raol, N., Sharma, M., Boss, E. F., Jiang, W., Scott, J. W., Learn, P., & Weissman, J. S. (2017). Tympanostomy Tube Placement vs Medical Management for Recurrent Acute Otitis Media in TRICARE-Insured Children. *Otolaryngology--head and neck surgery: official journal of American Academy of Otolaryngology-Head and Neck Surgery*, 157(5), 867–873. <https://doi.org/10.1177/0194599817707718>
9. Rosenfeld, R. M., Tunkel, D. E., Schwartz, S. R., Anne, S., Bishop, C. E., Chelius, D. C., Hackell, J., Hunter, L. L., Keppel, K. L., Kim, A. H., Kim, T. W., Levine, J. M., Maksimoski, M. T., Moore, D. J., Preciado, D. A., Raol, N. P., Vaughan, W. K., Walker, E. A., & Monjur, T. M. (2022). Clinical Practice Guideline: Tympanostomy Tubes in Children (Update). *Otolaryngology--head and neck surgery: official journal of American Academy of Otolaryngology-Head and Neck Surgery*, 166(1_suppl), S1–S55. <https://doi.org/10.1177/01945998211065662>
10. Steele, D. W., Adam, G. P., Di, M., Halladay, C. H., Balk, E. M., & Trikalinos, T. A. (2017). Effectiveness of Tympanostomy Tubes for Otitis Media: A Meta-analysis. *Pediatrics*, 139(6), e20170125. <https://doi.org/10.1542/peds.2017-0125>

Workgroup: Drs. Inman and Hollerud (Primary Care), Dr. Mary Ullman (Pharmacy), Dr. Abby Meyer (ENT), Dr. Bill Pomputius (ID)