Care and Treatment Plan: Otitis Media Acute – *Adult and Pediatric*

Definition

Acute inflammation or infection of the middle ear, often preceded by a viral upper respiratory tract infection (URTI). It is less common in adults than children.

Registered Nurses with **Remote Nursing** or **RN First Call** Certified Practice designation (RN(C)) are authorized to manage, diagnose, and treat adults and children with acute otitis media who are **6 months of age and older.**

Management and Intervention

Goals of Treatment

- Eradicate infection
- Relieve pain
- Prevent complications

Additional Pediatric Considerations

- Control pain and fever
- Avoid unnecessary use of antibiotics

Non-pharmacologic Interventions

- None

Pharmacologic Interventions

- To relieve pain and fever:
  - Acetaminophen 325mg, 1-2 tabs PO q4-6h PRN, or
  - Ibuprofen 200mg, 1-2 tabs PO q4-6h PRN
- Oral antibiotic therapy:
  - Amoxicillin 1 gm, PO TID for 5 days, OR
  - Doxycycline 200mg PO once, then 100mg PO BID for 5 days
- Failure of first line therapy:
  - Amoxicillin-clavulanate 875mg PO BID for 10 days

In case of allergies to the above antibiotics, previous antibiotic use within a month, or unavailability of the previously listed antibiotics, consult with or refer to a physician or nurse practitioner.

Pregnant and Breastfeeding Women

- Acetaminophen, amoxicillin, and amoxicillin-clavulanate may be used as listed above.
- DO NOT USE ibuprofen or doxycycline.

Pharmacological Interventions: Pediatric

To relieve pain and fever

- Acetaminophen
  - PO Acetaminophen for pain/fever (calculate 10-15mg/kg/**dose**; q4-6h)
  - PR Acetaminophen for pain/fever (calculate 10-15 mg/kg/**dose**; q4-6h)
  - *Note:* Max from all sources: acetaminophen 75mg/kg in 24 hours or 4,000mg in 24 hours. Whichever is less.

- NSAIDs, PO Ibuprofen [caution: renal]
  - Less than 6 months of age: calculate 5 mg/kg/**dose;** q8h
  - Greater than/equal to 6 months to 12 years: calculate 5-10 mg/kg/**dose**; q6-8h; **max 400 mg/dose**
  - Greater than 12 years: 200-400 mg/**dose**; q4-6h; **max 400 mg/dose**
  - *Note*: Max from all sources: ibuprofen 40mg/kg in 24 hours or 2,400mg in 24 hours, whichever is less

- NSAIDs, PO Naproxen
  - PO Naproxen BID (calculate 5 – 10mg/kg/dose; **max 500 mg/dose**)

Oral Antibiotic Therapy – Children 6 months and over

In 70% of cases, acute otitis media resolves on its own with supportive care only.

- Do not initially give antibiotics for children 6 months and older:
  - If the child is otherwise healthy
  - If the child is easily followed
  - If the symptoms are mild (mild otalgia, untreated fever less than 38.5°Celsius); and
  - If the child is non-toxic
- For these children:
  - Manage pain aggressively and keep well hydrated
  - If not improved in 2 days commence antibiotic therapy
- For children 6 months and older, institute antibiotics *without waiting* if:
  - Severe otalgia and/or irritability lasting longer than 24 hours
  - Fever higher than 38.5°Celsius
  - Tympanic perforation
  - Bilateral AOM
  - Antibiotic use for AOM in the previous 3 months
  - Presence of co-morbidities such as tonsillitis, which requires treatment
  - Children who will not be able to be re-examined in 2-3 days

Oral Antibiotic Therapy – Children 2 years and over/with complications

- A 5-day course is appropriate for children greater than 2 years with uncomplicated acute otitis media. For younger children or children of any age with complications (e.g., perforated eardrum) a 10-day course is appropriate.
  - Amoxicillin (standard dose) 40mg-50mg/kg per day, PO divided TID for 5-10 days; maximum dose 1,500mg/day, or
  - Amoxicillin-clavulanate (4:1 formulation) 40mg/kg/day divided TID for 5-10 days; dosing based on amoxicillin, maximum dose 1500mg/day
- If recurrent infection in less than 3 months or if symptoms fail to respond after 48 hours of treatment with initial antibiotics, then:
  - Amoxicillin (high dose) 80mg/kg/day, PO divided TID for 5-10 days; maximum dose 1,500mg/day, or
  - Amoxicillin-clavulanate (7:1 formulation) 45mg/kg/day divided BID for 5-10 days; maximum amoxicillin dose of 1500mg/day
- For clients with allergies to the above antibiotics, previous antibiotic use within a month, or unavailability of the previously listed antibiotics:
  - Azithromycin 10mg/kg/day once on first day, then 5mg/kg/day once daily for four days
  - Cefuroxime 15mg/kg/dose PO BID; maximum dose 1,000mg/day

Potential Complications

- Perforated tympanic membrane
- Reduced hearing (adult)
- Serous otitis media
- Mastoiditis (rare)
- Chronic otitis media
- Meningitis (rare)
- Epidural (brain) abscess
- Cholesteatoma

Additional Pediatric Considerations

- Facial paralysis

Client Education/Discharge Information

- Recommend increased rest if febrile
- Counsel client about appropriate use of medication (dosage compliance and follow up)
- Explain disease course and expected outcome
- Recommend avoidance of flying until symptoms have resolved
- Recommend avoidance of swimming or scuba diving until symptoms have resolved
- Counsel client to stop smoking

Additional Pediatric Considerations

- Advise on condition, timeline of treatment and expected course of disease process
- Recommend increased rest in the acute febrile phase
- Counsel parents or caregiver about appropriate use of medications (dosage, compliance, follow-up)
- Recommend avoidance of flying until symptoms have resolved
- Avoid feeding in a flat supine position
- Breast feeding recommended
- Avoid tobacco smoke
- Frequent and thorough hand washing
- Update immunizations if necessary
- Antihistamines and decongestants have no proven efficacy in the treatment of acute otitis media and should be avoided

Monitoring and Follow-up

- Re-examine patients with persistent pain or fever in 24-48 hours
- Return to clinic in three days if no improvement
- Follow up 10-14 days to look for development of serous otitis
- Assess hearing one to three months after treatment if any symptoms persist

Additional Pediatric Considerations

- Advise caregiver of follow up if condition does not improve in 48 hours or sooner if condition deteriorates
- Otherwise, follow up in 14 days:
    - If ear is normal, do not give any treatment

- If ear is still dull but asymptomatic (no pain or hearing loss), follow-up again in 6 weeks
- If condition is unresolved, consider treatment with a second-line antibiotic
- Look for development of serous otitis media

- In 70%-80% of clients, effusion persists after 2 weeks, and 10% still have effusion at 3 months and may exhibit conductive loss of hearing

Consultation and/or Referral

- No consult or referral needed if uncomplicated and responds to treatment
- If a perforation develops, consult with a physician or nurse practitioner

Additional Pediatric Considerations

- More than 3 infections in 6 months or 4 infections in one year
- Consult with a physician or nurse practitioner if there is no improvement in symptoms or condition worsens within 24-48 hours
- Hearing should be assessed by audiologist, community health nurse or other appropriate professional one month after treatment is complete if the child has had two or more cases of AOM

Documentation

As per agency policy.

References

More recent editions of any of the items in the References List may have been published since this DST was published. If you have a newer version, please use it.

Acute otitis media: Update on diagnosis and treatment. (2013). *Consultant, 53*(5), 352-353.

Alberta Medical Association. (2008). Guideline for the diagnosis and management of acute otitis media. *Toward Optimized Practice.* Edmonton, AB: TOP Alberta Doctors.

American Academy of Pediatrics. (2013). Clinical practice guideline: The diagnosis and management of acute otitis media. *Pediatrics, 131*(3), e964-e999.

Anti-Infective Review Panel. (2012). *Anti-infective guidelines for community-acquired infections*. Toronto, ON: MUMS Guideline Clearinghouse.

Ball, J. W., Dains, J. E., Flynn, J. A., Solomon, B. S., & Stewart, R. W. (Eds.). (2015). *Seidel's guide to physical examination* (8th ed.). St. Louis, MO: Elsevier.

Blondel-Hill, E., & Fryters, S. (2012). *Bugs and drugs*: *An antimicrobial infectious diseases reference.* Edmonton, AB: Alberta Health Services.

Canadian Dental Association. Antimicrobial treatment options in the management of odontogenic infections.

Canadian Pharmacists Association. (2014). *Therapeutic choices* (7th ed.). Ottawa, ON: Author.

Canadian Pharmacists Association. (2014). *Therapeutic choices for minor ailments*. Ottawa, ON: Author.

Cash, J. C., & Glass, C. A. (Eds.). (2014). *Family practice guidelines* (3rd ed.). New York, NY: Springer.

Carillo-Marquez, M. A. (2015). *Bacterial pharyngitis.*

Carter, S., & Laird, C. (2005). 10 assessment and care of ENT problems. *Emergency Medicine Journal, 22*, 128-139. doi: 10.1136/emj.2004.021642.

Cash, J. C., & Glass, C. A. (Eds.). (2014). *Family practice guidelines* (3rd ed.). New York, NY: Springer.

Centers for Disease Control and Prevention. (CDC). (2017). Candida infections of the mouth, throat, and esophagus. CDC.

Chan, P. D., & Johnson, M. T. (2010). *Treatment guidelines for medicine and primary care*. Blue Jay, CA: Current Clinical Strategies Publishing

Chen, Y. A., & Tran, C. (Eds.). (2011). *The Toronto notes 2011: Comprehensive medical reference and review for the Medical Council of Canada Qualifying Exam Part 1 and the United States Medical Licensing Exam Step 2* (27th ed.). Toronto, ON: Toronto Notes for Medical Students.

Chow, A.W. (2016). Complications, diagnosis, and treatment of odontogenic infections. UpToDate.

Chow, A. W. (2015). Epidemiology, pathogenesis, and clinical manifestations of odontogenic infections. *UptoDate*

Dains, J. E., Baumann, L. C., & Scheibel, P. (2012). *Advanced health assessment and clinical diagnosis in primary care* (4th ed.). St. Louis, MO: Elsevier Mosby.

DynaMed. (2015, March 31). *Acute apical dental abscess*.

DynaMed. (2015, August 17). *Acute otitis media (AOM)*.

DynaMed. (2016, March 25). *Antibiotics for streptococcal pharyngitis*.

DynaMed. (2016, March 25). *Streptococcal pharyngitis*.

DynaMed. (2016, March 25). *Pharyngitis*.

Estes, M. E. Z. (2014). *Health assessment and physical examination* (5th ed.). Clifton Park, NY: Cengage Learning.

Gore, J. M. (2013). Acute pharyngitis. *JAAPA: Journal of the American Academy of Physician Assistants, 26*(2), 57-58.

Gould, J. M. (2015, April 22). *Dental abscess*.

Gregoire, C. (2010). How are odontogenic infections best managed? *Journal of the Canadian Dental Association.76* (a37).

Guidelines and Protocols Advisory Committee. (2010). *Otitis media: Acute otitis media (AOM) and otitis media with effusion (OME)*

Harmes, K. M., Blackwood, R. A., Burrows, H. L., Cooke, J. M., Harrison, R., & Passamani, P. P. (2013). Otitis media: Diagnosis and treatment. *American Family Physician, 88*(7), 435-440.

Hersh, A. L., Jackson, M., & Hicks, L. A. (2013). Principles of judicious antibiotic prescribing for upper respiratory tract infections in pediatrics. *Pediatrics, 132*(6), 1146-1154.

Hirst, S., & Neill, S. (2013). Treatment of acute otitis media in childhood. *Practice Nursing*, *24*(8), 407-410

Jensen, B., & Regier, L. D. (Eds). (2014). *RxFiles: Drug comparison charts* (10th ed.). Saskatoon, SK: RxFiles

Lieberthal, A.S. et al., American Academy of Pediatrics. (2013). Clinical practice guideline: The diagnosis and management of acute otitis media. *Pediatrics, 131*(3), e964-e999.

Limb, C. J., Lustig, L. R., & Klein, J. O. (2014). Acute otitis media in adults (suppurative and serous). *UptoDate.*

McCarter, D. F., Courtney, U., & Pollart, S. M. (2007). Cerumen impaction. *American Family Physician, 75*(10), 1523-1528.

McWilliams, C. J., & Goldman, R. D. (2011). Update on acute otitis media in children younger than 2 years of age. *Canadian Family Physician, 57*(11), 1283-1285.

Michaudet C, Malaty J. Cerumen impaction: diagnosis and management. American Family Physician. 2018;98(8):7.

National Institute for Health and Clinical Excellence (NICE). (2008, July). *Respiratory tract infections – antibiotic prescribing: Prescribing of antibiotics for self-limiting respiratory tract infections in adults and children in primary care*. Manchester, UK: Author.

Peng, L. F. (2015, February 27). *Dental infections in emergency medicine*.

Porter, R. S., & Kaplan, J. L. (2011). Section 5: Ear, nose, throat and dental disorders. In *The Merck Manual* (19th ed.), (p. 411-534). Whitehouse Station, NJ: Merck Sharp & Dohme Corp.

Ramakrishnan, K., Sparks, R. A., & Berryhill, W. E. (2007). Diagnosis and treatment of otitis media. *American Family Physician, 76*(11), 1650-1658.

Sawyer, S. S. (2014). *Pediatric physical examination and health assessment*. Sudbury, MA: Jones & Bartlett Learning

Schwartz SR, Magit AE, Rosenfeld RM, et al. Cerumen impaction: an updated guideline from the AAO-HNSF. Otolaryngol Head Neck Surg. 2017;156(1_suppl):S1-S29. doi:10.1177/0194599816671491

Stephen, T. C., Skillen, D. L., Day, R. A., & Bickley L. S. (2010). *Canadian Bates' guide to health assessment for nurses.* Philadelphia, PA: Lippincott, Williams & Wilkins.

Shepherd, A. B. (2013). Assessment and management of acute sore throat. *Nurse Prescribing, 11*(11), 549-553.

Shulman, S.T., Bisno, A.L., Clegg, H.W., Gerber, M.A., Kaplan, E.L., Lee, G.,…Van Beneden, C. (2012). Clinical practice guideline for the diagnosis and management of group A streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America. *Clinical Infectious Diseases. 55*(10), e86-e102.

Substance Abuse and Mental Health Services Administration (SAMHSA). 2017. *Alcohol,Tobacco, and Other Drugs*.

University of Michigan Health System. (2013, May). *Pharyngitis: Guidelines for clinical care: Ambulatory* (Rev.). Ann Arbor, MI: Author.

Venekamp, R. P., Sanders, S. L., Glasziou, P. P., Del Mar, C. B., Rovers, M. M. (2015). Antibiotics for acute otitis media in children. *The Cochrane Database of Systematic Reviews,* (6). Doi: 10.1002/14651858.CD000219.pub4.