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PEDIATRIC ACUTE OTITIS MEDIA

DEFINITION

An acute suppurative infection of the middle ear, often preceded by a viral upper respiratory tract infection (URTI).

Nurses with Remote Practice Certified Practice designation (RN(C)s¹) are able to treat children with acute otitis media who are **6 months of age and older**.

POTENTIAL CAUSES

Viral Organisms

- Respiratory syncytial virus (RSV)
- Picornaviruses (rhinovirus, enterovirus)
- Influenza viruses
- Coronaviruses
- Adenovirus
- Human metapneumovirus.

Common Bacterial Organisms

- *Streptococcus pneumoniae*
- *Moraxella catarrhalis*
- *Hemophilus influenzae*
- *Pseudomonas aeruginosa*
- *Staphylococcus aureus*
- *Streptococcus pyogenes*

Less Common Organisms

- Mycoplasma
- Chlamydia

¹ RN(C) is an [authorized title](#) recommended by CRNBC that refers to CRNBC-certified RNs, and is used throughout this Decision Support Tool (DST).

CRNBC monitors and revises the CRNBC certified practice decision support tools (DSTs) every two years and as necessary based on best practices. The information provided in the DSTs is considered current as of the date of publication. CRNBC-certified nurses (RN(C)s) are responsible for ensuring they refer to the most current DSTs.

The DSTs are not intended to replace the RN(C)'s professional responsibility to exercise independent clinical judgment and use evidence to support competent, ethical care. The RN(C) must consult with or refer to a physician or nurse practitioner as appropriate, or whenever a course of action deviates from the DST.

Other Miscellaneous Causes

- Immunoreactivity
- Allergic rhinitis

PREDISPOSING RISK FACTORS

- Age – most frequent between 3 months to 3 years old (most important risk factor)
- Eustachian tube dysfunction
- Upper respiratory infection
- Allergies
- Cleft palate
- Immunosuppression
- Children exposed to cigarette smoke
- Children with Down syndrome
- Day care environment
- Children of Aboriginal origin (eustachian tubes shorter and wider)
- Possibly bottle-fed children, if the child is propped up for feeding or goes to sleep with a bottle of milk at night
- Children who use pacifiers when sleeping at night
- Fall and winter months

TYPICAL FINDINGS OF DENTAL ABSCESS**History**

- Otalgia (pain is absent in 20% of children)
- Fever
- Irritability
- Sensation of fullness
- Hearing decreased
- Tinnitus or roaring in ear, vertigo
- History of upper respiratory tract symptoms
- Tugging at ears
- Vomiting or diarrhea may be present
- Restless sleep

- Anorexia

Physical Assessment

- Vital signs. May be febrile.
- Weigh until 12 years of age for medication calculations
- May appear acutely ill
- Tympanic membrane red, dull, bulging
- Bony landmarks obscured or absent
- Purulent discharge if drum perforated
- Decreased mobility of tympanic membrane (pneumatic otoscope) (appendix 1)
- Bullae seen on tympanic membrane
- Peri-auricular and anterior cervical nodes enlarged and tender
- When safe to do so, wax and other debris should be removed from the ear canal to allow a clear view of the tympanic membrane
- Redness of the tympanic membrane in the absence of other signs may be due to crying, agitation, a common cold, aggressive examination or manipulation of the external ear canal, or serous otitis media with effusion

Diagnostic Tests

- Swab any drainage for culture and sensitivity

MANAGEMENT AND INTERVENTIONS

Goals of Treatment

- Control pain and fever
- Relieve infection
- Prevent complications
- Avoid unnecessary use of antibiotics

Non-Pharmacologic Interventions

- None

Pharmacologic Interventions

Note: All drugs must be calculated by weight until age 12. Doses should not exceed recommended adult doses.

- **To relieve pain and fever:**

- acetaminophen 10-15 mg/kg, po q4-6h prn. Do not exceed 75mg/kg/24hr or a total of 4,000mg/24hr, whichever is less, or
- ibuprofen 5-10mg/kg, po q6-8h prn. Do not exceed 40mg/kg/24hr

Oral Antibiotic Therapy:

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; and
 - if not improved in 2 days commence antibiotic therapy.
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- 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; and
 - Children who will not be able to be re-examined in 2-3 days,
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- Oral antibiotic therapy:
 - 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 40 mg / kg /day divided BID for 5-10 days. Dosing based on amoxicillin, max dose 1500 mg/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 45 mg/kg/day divided bid for 5-10 days **AND**
- Amoxicillin 45 mg/kg.day divided bid for 5-10 days – for a maximum dose of 1500 mg/day of amoxicillin. ****See note below.****

OR

- trimethoprim/sulfamethoxazole (TMP/SMX) 6-12mg/kg/day, po divided bid for 10 days. Maximum 160mg TMP/dose (320mg TMP/day)(Dose based on TMP)

For clients with penicillin allergy:

- trimethoprim/sulfamethoxazole (TMP/SMX) suspension, 6-12mg/kg/day, po divided bid for 5-10 days. Maximum 160mg TMP/dose (320mg TMP/day) (Dose based on TMP)

OR

- In case of allergies to the above antibiotics, previous antibiotic use within a month, or unavailability of the previously listed antibiotics:
- azithromycin 10 mg/kg/day once on first day, then 5 mg/kg/day once daily for four days.

****NOTE**** When using combined amoxicillin-clavulanate and amoxicillin, the goal is to administer the equivalent of high dose amoxicillin with a standard dose of clavulanate, as excess clavulanate increases the risk of diarrhea. In these cases **two separate bottles of antibiotic will be required to be dispensed:** plain amoxicillin AND amoxicillin-clavulanate.

- EXAMPLE of dose calculation for a 10 kg child:
 - Amoxicillin – 450 mg/day divided BID or 225 mg per dose

AND

- Amoxicillin – clavulanate suspension – 450 mg/day divided BID or 225 mg per dose of this suspension, dosing based on the amoxicillin.

Pregnant and Breastfeeding Women

- Acetaminophen, amoxicillin, amoxicillin-clavulanate and azithromycin may be used as listed above.

- DO NOT USE ibuprofen and trimethoprim/sulfamethoxazole

POTENTIAL COMPLICATIONS

- Perforated tympanic membrane
- Serous otitis media
- Mastoiditis (rare)
- Meningitis (rare)
- Facial paralysis

CLIENT/CAREGIVER EDUCATION AND DISCHARGE INFORMATION

- 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

- Advise caregiver of follow up if condition does not improved 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% to 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

- 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 1 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 Reference List may have been published since this DST was published. If you have a newer version, please use it.

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