Ear Infection Follow-up Call

Schmitt-Thompson Clinical Content

DEFINITION

- Recently examined and diagnosed as having a middle ear infection (otitis media)
- Caller is concerned that the child's fever, earache or other symptoms have become WORSE or are not improving fast enough
- Most of the patients are already taking an antibiotic
- Some patients have been seen and diagnosed with a mild ear infection (probably viral otitis) but not started on an antibiotic. They are on Observation (watchful waiting) with the expectation that the AOM will resolve spontaneously in 70% of them. Some have been given a prescription for an antibiotic with instructions to fill it if symptoms become WORSE OR stay the SAME (not improved) by 72 hours (3 days).
- **Also Included:** indications for ear tubes, prevention of recurrent infections

TRIAGE ASSESSMENT QUESTIONS

Call EMS 911 Now

Sounds like a life-threatening emergency to the triager

See More Appropriate Protocol

Recently seen for swimmer's ear (not otitis media)

Go to Protocol: Ear - Swimmer's (Pediatric)

New-onset of fever after antibiotic course completed

Go to Protocol: Fever - 3 Months or Older (Pediatric)

Go to ED/UCC Now (or to Office Now per Practice Policy)

Can't move neck normally

New-onset of unsteady walking OR falling down

R/O: associated labyrinthitis

Child sounds very sick or weak to the triager

Reason: severe acute illness or serious complication suspected

Go to Office Now

Fever > 105 F (40.6 C) by any route OR axillary > 104 F (40 C)

R/O: serious complication or resistant organism

Pain has become severe and not improved 2 hours after ibuprofen

R/O: severe otitis media, severe headache

Crying has become inconsolable and not improved 2 hours after ibuprofen

New-onset pink or red swelling behind the ear

R/O: mastoiditis

Crooked smile (weakness of 1 side of face)

R/O: facial nerve palsy

See in Office Today

New-onset vomiting (Exception: cough-induced vomiting OR vomiting with diarrhea)

R/O: middle ear pressure as cause or need for IM antibiotic

Taking antibiotic > 48 hours and fever persists or recurs

R/O: complication or resistant organism

Discuss With PCP and Callback by Nurse Today

Diagnosed with ear infection and symptoms WORSE (such as worsening pain, new ear discharge or fever > 102 F or 39 C) and doesn't have a prescription for antibiotic

Reason: PCP may approve a prescription

See in Office Within 3 Days

Taking antibiotic > 3 days and ear pain not improved or recurs

Taking antibiotic > 3 days and ear discharge persists or recurs

R/O: resistant organism or secondary otitis externa

Triager thinks child needs to be seen for non-urgent problem

Caller wants child seen for non-urgent problem

Home Care

Taking antibiotic < 48 hours and fever still present

Reason: taking antibiotic and no complications per triage

Taking antibiotic < 3 days and ear pain not improved

Reason: taking antibiotic and no complications per triage

Taking antibiotic < 3 days and ear discharge from ear canal also present

Reason: ruptured eardrum not healed yet

Taking antibiotic and reasonable improvement (no fever or pain)

Reason: taking antibiotic and no complications per triage

Not taking antibiotic and reasonable improvement (no fever or pain)

Reason: probably viral otitis

Not taking an antibiotic, BUT diagnosed with ear infection, has antibiotic prescription and symptoms WORSE (such as pain worse, new ear discharge or fever > 102 F or 39 C)

Response: needs to fill the prescription for antibiotic

Hearing loss, questions about

Prevention of ear infections, questions about

Ear tube surgery, questions about

Home Care Advice

Ear Infection Treatment

1. **Reassurance and Education - Ear Infection:**
   - Most bacterial infections do not respond to the first dose of antibiotic.
   - Often, there is no improvement the first day.
   - Children gradually get better over 2-3 days.
   - Note: For mild ear infections in children over 2 years old, antibiotics may not be needed.

2. **Continue the Antibiotic:**
   - The antibiotic will kill the bacteria that are causing the ear infection.
   - Try not to forget any of the doses.
   - Give the antibiotic until the bottle is empty (or all pills are gone). (Reason: prevent the ear infection from flaring up again).

3. **Fever Medicine:**
   - For fever above 102 F (39 C), give acetaminophen every 4 hours OR ibuprofen every 6 hours as needed. (See Dosage table)

4. **Pain Medicine:**
   - For ear pain, give acetaminophen every 4 hours OR ibuprofen every 6 hours as needed. (See Dosage table)

5. **Cold Pack for Pain:**
   - Apply a cold pack or a cold wet washcloth to outer ear for 20 minutes to reduce pain while medicine takes effect.
   - Note: Some children prefer local heat for 20 minutes.
   - Caution: Hot or cold pack applied too long could cause burn or frostbite.

6. **Olive Oil Eardrops for Persistent Pain:**
   - Do not recommend any eardrops if the child will be seen today.
   - Reason: May make it difficult to visualize the eardrums.
   - For severe earache unresponsive to oral pain medicine, recommend 3 drops of plain olive oil into the ear canal. Another option is plain mineral oil (baby oil). Repeat every 4 hours as needed.
   - Exception: ear discharge, ear tubes or hole in eardrum
   - Update: prescription analgesic ear drops that contain benzocaine-antipyrine are no longer available in the US (FDA 2015 regulation).

7. **Activity Restrictions:**
   - Your child can go outside and does not need to cover the ears.
   - Swimming is fine as long as there is no perforation (tear) in the eardrum or drainage from the ear.
   - Children with ear infections can travel safely by aircraft if they are taking antibiotics. Most will not have any increase in their ear pain while flying.
   - Give your child a dose of ibuprofen 1 hour before take-off to deal with any discomfort they might have. Also during descent (prior to landing) have your child swallow fluids, suck on a pacifier, or chew gum.

8. **Contagiousness:**
   - Your child can return to school or child care when feeling better and any fever is gone.
   - Ear infections are not contagious.

9. **Expected Course:**
   - If you give your child the antibiotic as directed, the fever should be gone by 2 days (48 hours).
   - The earache should be improved by 2 days and gone by 3 days (72 hours).

10. **Call Back If:**
    - Fever lasts over 2 days on antibiotics
    - Ear pain becomes severe or crying becomes inconsolable
    - Earache lasts over 3 days on antibiotics
    - Ear discharge is not improved after 3 days on antibiotics
    - Your child becomes worse

11. **Extra Advice: Patients on Watchful Waiting With Antibiotic Prescription and Symptoms Worse**
    - Your child needs to start the antibiotic.
    - Fill the prescription today.
    - Give the antibiotic as directed on the label.
    - The antibiotic will kill the bacteria that are causing the ear infection.
    - Try not to forget any of the doses.
    - Give the antibiotic until it's gone. Reason: prevent the ear infection from flaring up again.

12. **Extra Advice - Ear Discharge:**
    - Pus or cloudy fluid from the ear canal usually means the eardrum has a small tear in it caused by the pressure from the ear infection. It also occurs if your child has ear tubes.
    - The pus may be blood-tinged.
    - This usually heals nicely after the ear infection is treated.
    - Wipe the discharge away as it appears.
    - Avoid plugging the ear canal with cotton. (Reason: retained pus can cause infection of the lining of the ear canal)

13. **Extra Advice - Temporary Hearing Loss:**
    - During an ear infection, fluid builds up in the middle ear space instead of draining out normally to the back of the throat.
    - The fluid can cause a temporary mild hearing loss.
    - It will gradually improve and should resolve with the antibiotic treatment.
    - In some children, it may take longer for the fluid to go away, even though the fluid is no longer infected. In 90% of children, it clears up by itself over 1 to 2 months.
    - Permanent damage to the hearing from ear infections is very rare.
    - **Talking with your Child:** Get close to your child and get eye contact. Speak in a louder voice than you normally use. Reduce any background noise from radio or TV while talking with your child.
    - **Call Back If:** Hearing loss not improved after antibiotic course finished.

Recurrent Ear Infection Prevention

1. **Reassurance and Education - Prevention of Ear Infections:**
    - If your child has lots of ear infections, here are some ways to prevent future ones.

2. **Avoid Tobacco Smoke**:
    - Protect your child from tobacco smoke because it increases the frequency and severity of ear infections.
    - Be sure no one smokes in your home or at child care.

3. **Avoid Excessive Colds:**
    - Reduce your child's exposure to children with colds during the first year of life.
    - Most ear infections start with a cold.
    - Try to delay the use of large child care centers during the first year by using a sitter in your home or a small home-based child care.

4. **Breast-feed:**
    - Breast-feed your baby during the first 6 to 12 months of life.
    - Antibodies in breast milk reduce the rate of ear infections.

- If you are breast-feeding, continue.
- If you are not, consider it with your next child.

5. **Avoid Bottle-Propping:**
   - During feedings, hold your baby with the head higher than the stomach.
   - Feeding in the horizontal position can cause formula to flow back into the eustachian tube.
   - Allowing an infant to hold his own bottle also can cause milk to drain into the middle ear.

6. **Get All Recommended Immunizations:**
   - The pneumococcal vaccine and the flu vaccine will protect your child from serious diseases and some ear infections.

7. **Control Allergies:**
   - If your infant has a continuously runny nose, consider allergy as a contributing factor to the ear infections.
   - If your child has other allergies such as eczema, your child's doctor can check for a milk protein or soy protein allergy.

8. **Evaluate Any Snoring:**
   - If your toddler snores every night or breathes through their mouth, they may have large adenoids.
   - Large adenoids can contribute to ear infections.
   - Talk to your child's doctor about this.

Ear Tube Surgery

1. **Ventilation (PE or Ear) Tubes:**
   - Ear tubes (also called ventilation tubes) are tiny plastic tubes that are placed across the eardrum by an ENT surgeon.

2. **Purpose of the Tubes:**
   - Ear tubes allow fluid to drain out of the middle ear space and allow air to re-enter.
   - This reduces the risk of recurrent ear infections and returns the hearing to normal.

3. **Indications for Ear Tubes:**
   - Fluid has been present in the middle ear continuously for over 3 months and both ears have fluid.
   - In addition, the fluid has caused a documented hearing loss greater than 20 dB.
   - The reason to test the hearing first is that some children with fluid in their ears have nearly normal hearing and tubes are not needed.
   - A separate indication is for frequent ear infections or ear infections that do not clear up after trying multiple antibiotics.
   - Prevention techniques should be attempted before turning to surgery (such as avoiding second hand smoke exposure and stopping any pacifiers).
   - Discuss indications for ear tubes with your child's doctor.

4. **Expected Course:**
   - Normally the ear tubes come out and fall into the ear canal after about a year.
   - Then they come out of the ear canal with the normal movement of earwax.
   - If the tubes remain in the eardrum for over 2 years, the surgeon may need to remove them. Reason: risk of causing permanent hole.

5. **Risks of Ear Tubes:**
   - After the tubes come out, they may leave scars on the eardrum or a small hole that doesn't heal. Both of these problems can cause a small hearing loss.
   - Because of these possible complications and the need to give anesthesia to young children before the operation, physicians recommend ear tubes only for children who really need them.

FIRST AID

N/A

BACKGROUND INFORMATION

Otitis Media (Ear Infections)

- Definition: Inflammation of the middle ear cavity
- Symptoms: The main symptom is an earache. Younger children cry, act fussy or have difficulty sleeping because of the pain. About 50% of children with an ear infection have a fever.
- Cause: Blocked eustachian tube, usually as part of a common cold. This results in a middle ear effusion (viral otitis). If the fluid becomes superinfected (bacterial otitis), the effusion turns to pus, the TM bulges and pain increases.
- Ear infections peak at age 6 months to 2 years. They are a common problem until age 8.
- The onset of ear infections peak on day 3 of a cold.
- Prevalence: 90% of children have at least 1 ear infection. Repeated ear infections occur in 20% of children. Ear infections are the most common bacterial infection of childhood.

Complications of Bacterial Ear Infections

- **Tympanic Membrane Perforation:** In 5% to 10% of children, the pressure in the middle ear causes the eardrum to rupture and drain yellow or cloudy fluid. This small hole usually heals over in 2 or 3 days.
- **Mastoiditis:** bacterial infection of the air cells in the mastoid bone behind the ear. The mastoid area becomes pink, swollen and tender.
- **Labyrinthitis:** spread of middle ear infection to the inner ear. Symptoms are dizziness or even vertigo.
- **Facial nerve palsy (Bell's palsy):** The seventh cranial nerve is damaged while traveling through the infected middle ear space. Main symptom is a crooked smile. Early treatment with steroids is helpful.
- **Bacterial meningitis:** rare complication.

Ear Infections: 2013 AAP Clinical Practice Guideline for Children 6 Months through 12 Years of Age

- This important guideline contains 17 Key Action Statements (evidence-based recommendations). The following are ones that mainly apply to telephone triage and advice:
- Diagnosis of AOM requires visualization of the TM and should not be attempted by telephone alone. Diagnostic criteria for AOM are discussed in depth. Bulging of the TM must be present. The diagnostic specificity of other symptoms and signs is carefully documented.
- Severe AOM is defined as ear infection with moderate or severe otalgia (ear pain) OR fever equal to or higher than 39 C. (102 F).
- Mild AOM is defined as mild otalgia and fever < 39 C. (102 F). Importance: mild AOM can be watched for natural resolution versus worsening of symptoms.
- Treatment of Pain (Otalgia): The treatment of pain should never be overlooked. Antibiotic therapy does not provide pain relief during the first 24 hours after antibiotics are started. Therefore, pain management should be addressed regardless of the use of antibiotics.
- Oral analgesics: acetaminophen or ibuprofen have proven benefit (evidence-based)
- Topical analgesic eardrops (such as lidocaine or benzocaine) compared to saline eardrops provided reduced otalgia at 10 and 30 minutes. Duration of benefit unknown.
- Oil eardrops: "may have limited effectiveness, but no control studies"
- External application of heat or cold: "may have limited effectiveness, but no control studies"
- Note: because the latter home remedy may have placebo value and is harmless, it remains in the protocol as an intervention to be used until oral pain killers take effect.

• Antibiotic Treatment: Bacterial AOM remains the most common condition for which antibiotics are prescribed for children in the U.S. Amoxicillin remains the first line drug for most cases. If the child also has purulent conjunctivitis, Augmentin is recommended as the initial drug of choice. Average duration of antibiotic recommended: age less than 2 years: 10 days, 2-5 years: 7 days, and 6 years and older: 5 days.
• Observation (watchful waiting) Option: Some clinicians recommend close observation and close follow-up for selected patients with AOM. Those patients must be 6 months of age or older, have a fever less than 39 C (102 F) and have mild otalgia for less than 48 hours. The only change from the previous AAP guideline is the cutoff previously was 2 years or older. Research supports the safety of this change in age range. In studies using Observation with pain management, 70% of patients had natural resolution of symptoms without the need for antibiotic therapy.
• When Observation is used, antibiotic therapy should be started if "the child worsens OR fails to improve within 72 hours of onset of symptoms". Two additional triage questions were added to this telephone protocol to cover these follow-up outcomes. One allows the triage nurse to approve filling or starting the prescription the parent already has. The other allows the nurse to consult with the MD regarding a possible prescription.
• Summary: as AAP Clinical Practice Guidelines go, this one is extremely helpful. It is 30 pages long, but worth reading. If implemented in daily practice, it will prevent significant over-diagnosis and over-treatment of ear infections.
• Reference: Pediatrics 2013; 131: e964-e999

Analgesic Eardrops - No Longer Available (FDA 2015)

• 2015 FDA major change: Benzocaine-antipyrine ear drops have never been approved by the FDA. As of July 2015, they will no longer be available in U.S. pharmacies. Reason the FDA gives for this enforcement: Unproven effectiveness (not because of side effects).
• Previous information found in this protocol: Analgesic eardrops have long been prescribed in selected patients to reduce severe pain from otitis media (Hoberman 1997). Many teen and adult patients insist that these products give them pain relief.
• Generic analgesic eardrops and brand name Auralgan eardrops have identical ingredients (benzocaine and antipyrine). Both are prescription drugs in the U.S. In 2008, Deston Therapeutics, the company that makes Auralgan, changed the formulation and increased the price to $140/bottle. In the U.S., only generic analgesic ear drops had been previously recommended because of cost-savings.
• Canada: Can use Auralgan eardrops for severe pain. Reason: Available OTC in Canada.

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AUTHOR AND COPYRIGHT

Author: Barton D. Schmitt, MD, FAAP

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