JAAPA Edition

Ear Clinic

Vol. 1 No. 1 ▪ September 2004

KEEPING UP-TO-DATE WITH EAR INFECTIONS: A NEWSLETTER FOR PRIMARY CARE

How will the new practice guideline affect your management of acute otitis media?

Pediatric ear pain and infection occur so frequently that acute otitis media (AOM) is the most common infection for which antibiotics are prescribed.[1] Although clinicians see many ear infections, properly diagnosing AOM and discerning treatment is not always obvious.

When examining a child complaining about his ears, there are many factors to consider. Does the ear hurt? Where? How much? Is there fluid? Is the fluid draining? Does the child have a fever or difficulty sleeping at night?

Depending on the answers, AOM can be the problem, but there are other possibilities, such as acute or chronic otitis media with tympanostomy tube otorrhea (OMT) or otitis externa (see Table 1, page 2). AOM, an inflammation of the middle-ear space, may be associated with fever, pain, upper respiratory tract infection (URTI), hearing loss, or other signs and symptoms.

AOMT has an abundant and often purulent discharge. Unlike AOM with an intact tympanic membrane (TM), the patient will generally be free of pain and systemic symptoms. Prolonged contact with water can lead to an inflammation of the ear canal, or otitis externa, without involvement of the middle ear. When otitis externa is associated with prolonged moisture in the canal due to intense sweating or swimming, it is known as swimmer's ear. Pain on manipulation of the pinna is its diagnostic hallmark; redness and swelling of the ear canal and a cheesy white discharge are often present.

Guidelines help with the diagnosis

Identifying and managing AOM should be a little easier with publication of a clinical practice guideline issued jointly this spring by the American Academy of Pediatrics and the American Academy of Family Physicians. The guideline clarifies the findings necessary to diagnose AOM (see Table 2, page 3). Specifically, the diagnosis of AOM must meet 3 criteria: rapid onset of illness, presence of middle-ear effusion (MEE), and signs and symptoms of middle-ear inflammation.[1] Signs and symptoms of a viral URTI, such as cough and nasal discharge or stuffiness, often precede or accompany AOM.

To establish the diagnosis, the clinician must be able to visualize the TM and identify MEE (fluid) and inflammatory changes. Fullness or bulging of the TM is often present and has the highest predictive value for the presence of MEE. Reduced mobility of the drum on pneumatic otoscopy and presence of ear pain or a distinct red color are also helpful in defining the presence of AOM.[2]

Opacification or cloudiness of the TM, other than from scarring, is also a consistent finding with MEE. Redness of the TM from inflammation must be distinguished from the pink erythematous flush caused by crying or high fever, which remits as the child calms down.

An uncertain diagnosis of AOM is most often caused by inability to confirm MEE. In fact, discriminating between otitis media with effusion (OME) and AOM is a major challenge for practitioners. OME is more common than AOM and may accompany a viral URTI or be a prelude or a sequela of

IN THIS ISSUE

CONSULTANTS

S. MICHAEL MARCY, MD, FAAP, Clinical Professor of Pediatrics at the University of Southern California School of Medicine and at the University of California at Los Angeles School of Medicine, Center for Vaccine Research, Harbor-UCLA Medical Center, Torrance, Calif.

ARCHANA B. JASANI, MD, pediatrician in private practice, Falls Church, Va.

Developed and produced by the *Journal of the American Academy of Physician Assistants*.
Supported through an educational grant from **Alcon Laboratories**.

AOM. "It is often accompanied by mild or intermittent ear pain or discomfort and the appearance of the TM can be similar to that which is seen with AOM," according to S. Michael Marcy, MD, a guideline consultant and Clinical Professor of Pediatrics at the University of Southern California School of Medicine and at the University of California at Los Angeles School of Medicine.

Diagnosing AOM in infants and young children is often made with a degree of uncertainty. Consequently, when OME is mistakenly identified as AOM, antibacterial agents may be prescribed unnecessarily.

Performing tympanocentesis is the only definitive way of making the diagnosis of AOM. It establishes the presence of MEE, an inflammatory response, and organisms, which can be detected with the proper microbiologic technique. "The procedure is frightening and painful for the child, however, and most clinicians are reluctant to do it," according to Dr Marcy.

Acoustic reflectometry will detect the presence of MEE, with an 80% to 85% positive predictive value.[3] Tympanometry will also reveal the presence of MEE but is often difficult to perform, especially on a febrile, crying child under a year of age because it is difficult to get a complete seal of the external auditory canal.

TABLE 1

Signs and symptoms of otitis externa

Intense ear pain
Edema of the ear canal
Otorrhea
Debris in the canal
Itchiness
Hearing loss

Pneumatic otoscopy—the most practical clinical tool available—allows clinicians to define the position, mobility, and color of the TM. A recent review of the literature finds that pneumatic otoscopy has a sensitivity of 94% and a specificity of 80%.[4] Eardrum redness alone has only a 10% to 15% positive predictive value.[2]

The guideline acknowledges that while every effort should be made to differentiate AOM from OME or a

How to administer ototopical antibiotics

Ototopical antibiotics must be administered appropriately to be effective. In the presence of an intense inflammatory response, ototopical treatment failure is often the result of inadequate delivery of drug to the affected areas. It is essential to first remove as much exudate as possible from the external auditory canal to ensure that medicine reaches the infected area. In extreme cases, it may be necessary to do this on a daily basis. Only after the canal is thoroughly cleansed should ear drops be administered.

Here is the recommended way to administer topical drops: With the child lying on his or her side, insert 4 drops into the external auditory canal of the affected ear. The child should remain in that position for exactly 1 minute. If the swelling of the ear canal is so severe that the drops do not run in, it may be necessary to insert a cellulose wick into the canal to provide continuous contact of the antibacterial agent with the inflamed skin. The ear should be reexamined and the wick changed every 2 to 3 days until swelling is adequately resolved to permit direct instillation of otopical therapy into the canal.

If antibiotic drops are intended to go into the middle ear through a draining tympanostomy tube or the rupture site of the tympanic membrane, the clinician or caregiver should fill the canal with antibiotic drops in the same way and then push on the tragus 5 times to ensure the drops enter the middle ear. This should be done twice a day.

normal ear, uncertainty will remain in some cases. Making a solid diagnosis is especially difficult for practitioners who do not look at children's ears on a regular basis. Often a child is taken to the emergency department where the practitioner observes a red eardrum—which could have been caused by crying or high fever—and prescribes antibiotics. The next day, when the child's practitioner examines the child, the ears look fine and the child is unnecessarily committed to a course of antibiotics.

Archana B. Jasani, MD, a pediatrician in Falls Church, Va, says that making the right diagnosis is a challenge because it is difficult to get children to hold still. "With a lot of little kids, you get less than 10 seconds to look." Sometimes the eardrum is so red and opaque that it is difficult to actually see fluid. "The eardrum is like a thin curtain; you can sometimes see right through it," Dr Jasani explains. When there is fluid, the light reflex is distorted. If there is clear fluid, such as the fluid seen with OME, the child can feel a sensation of pressure that can interfere with hearing or cause difficulty with balance but is in and of itself not a sign of infection.

Clinicians used to think that fluid behind the TM signified an ear infection, and they treated it with antibiotics. But now clinicians know that fluid can persist regardless of treatment; the duration of fluid accumulation is not affected by the use of antibiotics. In fact, fluid in the ears following AOM can take 2 to 3 months to resolve on its own.

Treatment considerations

From pain management to proper antibiotic use, the guideline provides new considerations for treating AOM. Because ear pain is often the primary reason for the initial clinic visit, the guideline strongly recommends that clinicians pay special attention to pain management. For infants, pain may manifest itself indirectly as crying, irritability, interference with sleep, or ear pulling. Among older children, complaints of pain, fullness in the ear, or difficulty hearing are more readily recognizable symptoms. Acetaminophen or ibuprofen—the mainstay for AOM pain management—is recommended

TABLE 2

Criteria for AOM

Recent, rapid onset of signs and symptoms of middle-ear effusion and inflammation
And
Middle-ear effusion indicated by bulging of the TM *or*
Limited or absent mobility of the TM *or*
Air/fluid level behind the TM
And
Middle-ear inflammation indicated by
- Distinct erythema of the TM *or*
- Distinct otalgia referable to the ears that interferes with normal activity or sleep

Key: AOM, acute otitis media; TM, tympanic membrane.

Adapted with permission from Diagnosis and management of acute otitis media. *Pediatrics.* 2004;113:1451-1465. Copyright 2004 American Academy of Pediatrics.

TABLE 3

Ototopical preparations for pediatric ear infections

Agent	Class	Dosage
AOMT		
Ciprofloxacin-dexamethasone (Ciprodex Otic)	Fluoroquinolone/ anti-inflammatory	≥6 mo: 4 drops bid for 7 d
Ofloxacin (Floxin Otic)	Fluoroquinolone	1-12 y: 5 drops bid for 10 d; ≥12 y: 10 drops bid for 10 d
AOE		
Ciprofloxacin-dexamethasone (Ciprodex Otic)	Fluoroquinolone/ anti-inflammatory	≥6 mo: 4 drops bid for 7 d
Ciprofloxacin HCl-hydrocortisone (Cipro HC Otic)	Fluoroquinolone/ anti-inflammatory	≥1 y: 3 drops bid for 7 d
Neomycin-hydrocortisone-polymyxin B sulfate (Cortisporin Otic, Pediotic)	Antibacterial/ corticosteroid	3 drops tid or qid for 10 d
Ofloxacin (Floxin Otic)	Fluoroquinolone	1-12 y: 5 drops bid for 10 d; ≥12 y: 10 drops bid for 10 d

Key: AOE, acute otitis externa; AOMT, acute otitis media with tympanostomy tubes.

New AOM treatment guideline empowers clinicians

The first national treatment guideline for diagnosis and management of acute otitis media (AOM) encourages clinicians to immediately address the pain associated with AOM and offers the "observation option" before prescribing systemic antibiotics.

The guideline, *Diagnosis and Management of Acute Otitis Media*, was released by the American Academy of Pediatrics and the American Academy of Family Physicians in the spring and can be found at http://www.aafp.org/x26481.xml.

Founded on evidence-based literature and other data, the guideline applies to otherwise healthy children aged 2 months to 12 years old without underlying conditions that may alter the natural course of AOM. These conditions include anatomic abnormalities such as cleft palate, genetic conditions such as Down syndrome, immune system disorders, and cochlear implants. Children with a clinical recurrence of AOM within 30 days or AOM with underlying chronic otitis media with effusion (OME) are also excluded.[1]

In summary, the guideline recommends

- Accurately diagnosing AOM to differentiate it from OME, which is more common. OME may be a prelude or sequela to AOM and requires different management
- Relieving pain with ibuprofen or acetaminophen
- Deferring antibiotics for select children for 48 to 72 hours
- Ordering antibiotics initially for certain children who would benefit the most
- Prescribing amoxicillin for most children when antibiotics are deemed necessary
- Encouraging families to prevent AOM by reducing risk factors—breastfeeding for child's first 6 months, avoiding bottle propping, reducing or eliminating pacifier use in the second 6 months of life, and eliminating smoke exposure.

According to the guideline, antibiotics should be prescribed immediately for

- Children aged 6 months and younger
- Children aged 6 months to 2 years for certain AOM or suspected AOM with severe symptoms; observation option for nonsevere symptoms
- Children aged 2 to 12 years with severe symptoms; observation is an option for suspected or nonsevere AOM.

Most children with AOM have significant ear pain, which may manifest in young children as ear rubbing, sleep disruption, or fever. Analgesics are most important in the first 24 hours after diagnosis, especially before the child's bedtime.

Concern about rising antibacterial resistance of the organisms that cause AOM, cost, and other factors suggested the need for the guideline. Research presented in the guideline shows that children whose ear infections are not treated immediately with antibiotics are not likely to develop a serious illness, the guideline said.

The guideline is "wonderfully empowering" because it provides clinicians with flexibility to appropriately treat children with middle-ear infections, says Theodore Ganiats, MD, cochair of the guideline panel and Professor, Department of Family and Preventive Medicine and Executive Director, University of California at San Diego School of Medicine Health Outcomes Assessment Program in La Jolla, Calif.

Some of this flexibility stems from the "observation option." Dr Ganiats says this is a new concept for some clinicians, but the option encourages them to discuss treatment possibilities with parents and give parents a more active decision-making role.

In the past, antibiotics were prescribed to some children with ear infections to meet parental expectations. More parents nowadays are willing to wait and see if antibiotics are necessary according to Dr Ganiats.

The observation option is a "nice alternative" to prescribing antibiotics, says Elizabeth M. Talotta, MPH, PA-C, a physician assistant in the emergency department at INOVA Fairfax Hospital in Falls Church, Va. The guideline also gives her rein-

for mild to moderate pain, especially in the first 24 hours.[1]

Parents will not see symptomatic improvement in children without treating the pain even if antibiotics are prescribed, Dr Jasani says. "The antibiotics are not going to kick in right away anyway," she adds.

Besides using acetaminophen or ibuprofen, Dr Jasani uses a topical agent, typically benzocaine, to immediately abate pain. Dr Marcy notes that for ears without ruptured eardrums, the home remedy—warm olive or mineral oil—placed in the ear canal has "stood the test of time" for relieving ear pain.

Observation option

After addressing the pain, a clinician needs to decide if antibiotics are initially necessary or if a wait-and-see approach is more appropriate. While some clinicians believe that ear infections should be treated immediately with oral antibiotics, there are good reasons to delay or avoid antibiotic treatment. Evidence that children can get well without taking oral antibiotics continues to mount as does general concern about bacterial resistance and cost.

The likelihood of recovery without antibacterial therapy depends on the severity of signs and symptoms at initial examination. Properly selected children whose ear infections are not treated immediately with antibiotics are not likely to develop a serious illness according to the new guideline.

The guideline encourages clinicians to consider the "observation option,"

forcement when parents insist on antibiotics unnecessarily. Many parents, she says, falsely perceive that antibiotics will remove the pain more quickly.

As Dr Ganiats notes, the immediate use of antibacterial agents was associated with about 1-day shorter illness and one-half teaspoon a day less acetaminophen consumption, but no difference in school absence, pain, or distress scores. Among children with fever or vomiting on day 1, those receiving immediate antibacterial agents were 21% less likely to have distress on day 3. In children without fever or vomiting, immediate antibacterial agents decreased distress on day 3 by only 4%.

The observation option is for select children, Dr Ganiats emphasizes. For example, given 2 children with the exact same history and presentation, observation might be offered to one and not the other because of other factors, such as language barriers, parent reliability, and ease of returning to the office.

When using the observation option, clinicians should consider offering to call and follow up with the parent or caregiver to see if the child has improved, suggests Linda Carlson, MS, RN, CPNP, a pediatric nurse practitioner, educational consultant, and adjunct faculty member at Georgia Southern University in Statesboro, Ga. Calling the parent or having someone from her practice call "always made me very popular" with parents, she reports.

There are differences of opinion within the medical community about diagnosis and treatment of ear infections, Dr Ganiats said, and the guideline provides the flexibility for clinicians to use their best treatment judgment. In fact, there is a small contingent of clinicians who maintain that those children with a certain diagnosis of an ear infection should be treated with antibiotics, he says.

Of course, certain diagnosis is not always achievable, even with the guideline and the most thorough diagnostic methods. "In the real world, we are frequently not positive of the diagnosis we have made," Dr Ganiats points out. Because the guidelines recognize that uncertainty, clinicians maintain the freedom and flexibility to apply the principles behind the guidelines in real-world situations.

Ms Carlson grants that the observation option is controversial because of a lack of high-quality studies that show this approach to be more effective than the traditional approach of immediately prescribing antibiotics. Some clinicians have expressed concern that not treating children immediately may result in an increase in complications, such as mastoiditis, but this has not been supported by the available evidence. Sometimes AOM is viral, so using the observation option can discourage unnecessary use of antibiotics, which will help reduce antibiotic resistance.

If antibiotics are necessary, the guideline makes it clear that a high dosage of amoxicillin is the "drug of choice," observes Patrick E. Killeen, MS, PA-C, a physician assistant for the department of pediatrics at Danbury Hospital in Danbury, Conn. The higher dosage of amoxicillin seems to be a more accepted approach than even several years ago when it was first suggested, Mr Killeen says. "I don't think every practitioner is using the high dosage like they should," he explains. When a child is put on too low a dosage of amoxicillin, treatment failure and resistance to antibiotics are much more likely.

Reducing pain is a strong guideline recommendation and a critical reminder not to get so caught up in whether or not to use antibiotics that pain is overlooked. "We have to recognize that if the child has acute otitis media they are uncomfortable and we should address that issue," Ms Carlson notes.

It is also important to review the appropriate dosage of analgesics because as children grow the dosage will increase. Parents may be giving too low a dosage for effective pain relief.

1. American Academy of Pediatrics, American Academy of Family Physicians. Clinical practice guideline: diagnosis and management of acute otitis media. *Pediatrics.* 2004;113:1451-1465.

which includes deferring antibacterial treatment of selected children for 48 to 72 hours and limiting management to symptomatic relief. Dr Jasani notes that many parents—perhaps 9 out of 10 who bring their children to her practice—are willing to consider the observation option.

This option should be limited to otherwise healthy children 6 months to 2 years of age with nonsevere illness at presentation and an uncertain diagnosis and to children 2 years of age and older without severe symptoms at presentation or with an uncertain diagnosis, the guideline says. For children with an uncertain diagnosis, particularly those under 2 years of age, the clinician should rule out the presence of lower respiratory tract or urinary tract infection as a cause of the fever or other signs or symptoms of infection.

If the observation option is used, the clinician should tell parents or caregivers the level of diagnostic certainty and consider their preference. The clinician also should verify the presence of an adult who will reliably observe the child, recognize signs of serious illness, and be able to provide prompt access to medical care if improvement does not occur. Reevaluation of the child must also be possible. If necessary, the parent or caregiver must also be able to conveniently obtain medication.

If there is worsening of illness or no improvement in 48 to 72 hours on observation, the use of antibiotics should be considered. Antibiotics should be prescribed immediately for children aged 6 months and younger for cer-

Case study: A 3-year-old with middle-ear effusion and inflammation

A 3-year-old boy who attends day care and has an older sibling in elementary school complains of pain in his right ear. His mother reports a runny nose and slight cough for 4 days. The night before presentation, his temperature was 100.4°F (38°C). However, he did sleep well after taking ibuprofen.

The child has had 2 episodes of acute otitis media (AOM) in the past, and most recently 6 months ago. Both cases were treated with antibiotics. He is generally healthy, with no history of allergies or asthma and no known drug allergies. Upon examination, his right tympanic membrane appears bulging and injected. His eyes, nose, left ear, heart, and lungs are normal, and there is no evidence of lymphadenopathy.

Having met the criteria for AOM—acute onset of signs and symptoms, the presence of middle-ear effusion, and signs and symptoms of middle-ear inflammation—the child is diagnosed with uncomplicated AOM of the right ear.

Since the boy appears to have uncomplicated AOM, the parent is first praised for appropriately treating the pain and further pain treatment is discussed. The clinician also mentions the observation option and the advantages of delaying oral antibiotic treatment to ensure its necessity. The mother agrees to monitor her son and contact the clinician's office if symptoms do not improve in 48 to 72 hours. If the child had AOM with either tympanostomy tubes or a perforated tympanic membrane as evidenced by otorrhea, the clinician would prescribe an ototopic antibiotic preparation or ototopic antibiotic combined with an anti-inflammatory preparation.[1]

If the boy's symptoms do not improve, he will be reexamined to confirm AOM and exclude other causes of illness. Upon reconfirming the diagnosis, the clinician would prescribe high-dosage amoxicillin, 80 or 90 mg/kg/d in 2 divided doses.

1. Morden NE, Berke EM. Topical fluoroquinolones for eye and ear. *Am Fam Physician*. 2000;62:1870-1876.

Contributed by Julee Waldrop, MS, FNP, PNP

Quick facts about AOM

- The direct cost of acute otitis media (AOM) was estimated at $1.96 billion in 1995, while indirect costs were estimated to be $1.02 billion that year.[1]
- An individual course of antibacterial therapy can range from $10 to more than $100.[1]
- The number of office visits for otitis media has decreased over the past decade from 25 million in 1990 to 16 million in 2000. Meanwhile, the number of antibiotic prescriptions to treat AOM has held steady at 13 million.[1]
- Fifty percent of antibiotics for US preschoolers are prescribed to treat ear infections.[2]

1. American Academy of Family Physicians and American Academy of Pediatrics. Diagnosis and Management of Acute Otitis Media. 2004. Available at: http://www.aafp.org/x26481.xml. Accessed June 20, 2004.

2. American Academy of Pediatrics and American Academy of Family Physicians. Question and Answers on Acute Otitis Media. Available at: http://www.aap.org/advocacy/releases/aomqa.htm. Accessed June 20, 2004.

tain or suspected AOM; children aged 6 months to 2 years for certain AOM or suspected AOM with severe symptoms; and for children aged 2 to 12 years who have AOM with severe symptoms.

Most children should be prescribed amoxicillin at 80 to 90 mg/kg/d.[1] Amoxicillin is first-line therapy in most patients with AOM because of its general effectiveness against susceptible and intermediate resistant-pneumococci, and because of its safety, low cost, acceptable taste, and narrow microbiologic spectrum.

If the child is initially febrile, the patient is expected to defervesce within 48 to 72 hours. The child should be less irritable and sleeping and eating patterns should begin to return to normal. "If you are observing the patient and he or she has not improved in 48 to 72 hours, treat," Dr Marcy advises. In addition, "If you are treating the patient and they are not improved in 48 to 72 hours, change therapy."

AOM, many studies have shown, is mostly caused by 3 bacterial pathogens: *Streptococcus pneumoniae*, nontypeable *Haemophilus influenzae*, and *Moraxella catarrhalis*. *S pneumoniae* has been recovered from the middle-ear fluid of 25% to 50% of children with AOM, *H influenzae* from 15% to 30%, and *M catarrhalis* from about 3% to 20%.[5] High dosages of amoxicillin (80-90 mg/kg/d) divided into 2 daily doses can effectively treat all *S pneumoniae* infections that are penicillin-susceptible or exhibit intermediate resistance, while tackling most of the more resistant *S pneumoniae* organisms as well, according to Dr Marcy.

Amoxicillin can also handle 50% to 70% of nontypeable *H influenzae*. However, almost 100% of *M catarrhalis* infections are resistant to treatment with amoxicillin. Therefore, children who fail at amoxicillin therapy might do better with amoxicillin-clavulanic acid, 90 mg/kg/d in 2 divided doses. If they have a history of a nonanaphylactic (type 1) reaction to

PRACTICE MANAGEMENT INFORMATION

Coding for otitis media

Primary care clinicians often see 5 kinds of otitis media cases and have 24 codes to choose from (381.00-382.9) for otitis media. To select the correct code, the clinician needs to note whether the otitis media is chronic or acute; serous (thin or thick fluid), suppurative (with pus), sanguineous (with blood), mucoid (with mucous), or allergic; and whether the eardrum has ruptured.

Case	Code and comment
Ear infection discovered at a well visit; no discomfort	Code separately for the ear infection, using an office visit (99211-99215) with modifier -25 *(Significant, separately identifiable evaluation and management (E/M) service by the same clinician on the same day of the procedure or other service)* appended only if you perform a significant and separately identifiable service over and above what you did for the preventive medicine service. Link the otitis media diagnosis, usually 381.01 *(Nonsuppurative otitis media and Eustachian tube disorders; acute serous otitis media)* or 382.00 *(Acute suppurative otitis media without spontaneous rupture of eardrum)*, to the office visit. Link V20.2 *(Routine infant or child health check)* to the preventive medicine service.
Minor discomfort or low fever; infection discovered early	The ear infection discovered early is most likely 382.00. Code for an office visit (99211-99215).
High fever and advanced and painful ear infection	Use the otitis media diagnosis code (382.00) as the primary diagnosis and the fever (780.6) as the secondary diagnosis. The evaluation and management (E/M) level is determined by the documentation, not by the diagnosis codes. However, a complicated diagnosis might substantiate a higher-level E/M code depending on the documentation.
Recovering from a cold	Code an ear infection caused by a viral upper respiratory tract infection (URTI) with the ear infection diagnosis—382.00. Although a URTI diagnosis (465.x) may also be used, it would not necessarily justify billing at a higher level. Code for the office visit (99211-99215).
Recurrent infections with surgical evaluation needed	There is no specific ICD-9 code for recurrent ear infections. Once a child has had a certain number of infections in a year—usually more than 3 in 6 months or 4 in a year—the clinician usually refers the child to a otolaryngologist.

Source: Family Practice Coding Alert, November 2002. The Coding Institute, 2272 Airport Rd S, Naples, FL 34112. Phone: (800) 508-2582; Fax: (800) 508-2592; Web: http://www.codinginstitute.com. Please contact the publisher for a free sample or information on how to subscribe.

penicillin, therapy with a cephalosporin such as cefdinir, 14 mg/kg/d in 1 or 2 divided doses, cefuroxime, 30 mg/kg/d in 2 divided doses, or cefpodoxime, 10 mg/kg once daily, would be appropriate. These drugs are active against most beta-lactamase positive bacteria.

Children with a persistently draining ear may benefit from the additional use of ototopical antibiotic agentsto achieve resolution (see Table 3, page 3). Fluoroquinolone otic drops are generally adequate and would be preferred over neomycin preparations because of the risk of skin sensitization and ototoxicity caused by the latter.

For a patient with swimmer's ear, a broad-spectrum ototopical fluoroquinolone preparation such as ciprofloxacin, combined with an anti-inflammatory agent such as dexamethasone (Ciprodex Otic) would be useful in swimmer's ear because this combination provides an antibiotic to treat the infection and an anti-inflammatory to treat the inflammation and edema associated with swimmer's ear pain.[6]

REFERENCES

1. American Academy of Pediatrics, American Academy of Family Physicians. Clinical practice guideline: diagnosis and management of acute otitis media. *Pediatrics.* 2004;113:1451-1465.

2. Pelton S. Otoscopy for the diagnosis of otitis media. *Pediatr Inf Dis J.* 1998;17:540-543.

3. Block SL, Mandel E, McLinn S, et al. Spectral gradient acoustic reflectometry for the detection of middle ear effusion by pediatricians in suppurative acute otitis media. *Pediatr Inf Dis J.* 1999;18:741-744.

4. Takata GS, Chan LS, Morphew T, et al. Evidence assessment of the accuracy of methods of diagnosing middle ear effusion in children with otitis media with effusion. *Pediatrics.* 2003;112;1379-1387.

5. Klein JO. Otitis media. *Clin Infect Dis.* 1994;19: 823-833.

6. Roland PS, Kreisler LS, Reese B, et al. Topical ciprofloxacin/dexamethasone otic suspension is superior to ofloxacin otic solution in the treatment of children with acute otitis media with otorrhea through tympanostomy tubes. *Pediatrics.* 2004;113:e40-e46.

Parents' and Caregivers' Guide to Managing Ear Infections

Acute otitis media is a common middle-ear infection in children. The child becomes suddenly ill with pain, irritability, fever, hearing loss, and drainage. Babies with ear infections might fuss when lying down or tug at their ears. Ear infections, which can be caused by viruses or bacteria, are often complications of other upper respiratory tract illnesses such as colds.

Treating ear infections

Since ear infections can be very painful, making your child more comfortable is the first concern. Clinicians often recommend ibuprofen or acetaminophen to relieve ear pain. In some cases, your child's clinician might prescribe topical ear drops that have anti-inflammatory agents to help reduce swelling and fluid.

Do not be surprised if your child's clinician does not immediately prescribe antibiotic drugs for your child's ear infection. Clinicians throughout the country are recommending these drugs only when necessary. Some antibiotics have lost their ability to kill certain bacteria because they have been used widely. Antibiotics can sometimes cause allergic reactions and side effects. They can be expensive.

Some ear infections are caused by viral infections, and antibiotics can only kill bacteria. Your child's natural defenses can fight a viral infection and might be able to fight the bacterial infection on their own.

Wait and see

Depending on your child's situation, the clinician might advise a "wait and see" approach. If your clinician advises this, continue treating the child's pain and other symptoms. Giving a sick child adequate fluid and rest is also always the best advice for fighting off infections.

However, if your child does not improve or gets sicker within 48 to 72 hours, it is critical to report this to the clinician's office. The child might need to be reexamined, and the clinician might prescribe antibiotics.

When using antibiotics

Some children, such as those with a history of ear infections or those who have tubes in their ears, might get treated with antibiotics right away. Always make sure your child takes all the antibiotics prescribed unless given other advice by the clinician.

Ear infections, in and of themselves, are not contagious. The child can return to normal activities when pain and fever subside.

Preventing ear infections

The good news is ear infections can be prevented. Breastfeeding babies during their first 6 months of life, reducing or eliminating pacifier use in the second 6 months of life, and avoiding bottle propping help prevent ear infections.

Since children exposed to secondhand smoke have a greater chance of suffering from upper respiratory tract illnesses, avoiding your child's exposure to secondhand smoke helps keep your child well. Encourage smokers to quit or at least restrict smoking to outdoors. Reducing time in childcare centers, when possible, also significantly reduces illness.

For more information, visit the American Academy of Pediatrics online at http://www.aap.org.