GUIDELINES & PROTOCOLS
ADVISORY COMMITTEE

Acute Otitis Media (AOM)

Revised 2004

Scope

Acute otitis media (AOM) is defined as the presence of inflammation in the middle ear accompanied by the rapid onset of signs and symptoms of an ear infection (See Recommendation 1).[1]

This guideline applies to otherwise healthy children over the age of three months presenting with AOM. It does not include children with craniofacial abnormalities, immune deficiencies, complications of AOM (e.g. mastoiditis, facial paralysis, etc.) or serious underlying disease. Refer to the *Otitis Media with Effusion (OME)* guideline for children with OME.

Recommendation 1: Distinguish between AOM and OME

Ear discomfort, red tympanic membranes, or fever alone are not specific diagnostic criteria.[2]

Children with AOM present with combinations of ear pain (otalgia), loss of landmarks, and an opaque, bulging, inflamed tympanic membrane on direct otoscopy.[2]

Otitis media with effusion (OME) is defined as the presence of fluid in the middle ear without signs and symptoms of an ear infection. Reduced mobility on pneumatic otoscopy supports the diagnosis of OME. The ear is not acutely painful, but the child may have ear discomfort.

Decreased mobility on pneumatic otoscopy may help identify OME.[1] Pneumatic otoscopy is not routinely recommended for AOM because it may elicit severe pain.

Recommendation 2: Management of AOM

Aggressively manage pain with adequate systemic analgesics (not ASA), and:[1,3-6]

- if younger than 24 months old, treat with antibiotics (see Recommendation 3);
- if older than 24 months, most cases of AOM resolve with systemic analgesics alone and do not require antibiotics.[1,3,4,5,6] If signs and symptoms of AOM persist in spite of systemic analgesics after 48 to 72 hours, treat with antibiotics (see Recommendation 3).

Note: Decongestants, antihistamines, steroids and topical antibiotics are not beneficial in the treatment of AOM.

Discuss risk factors for recurrent AOM with the parent or guardian including: environmental tobacco smoke, daycare attendance, pacifier use, and bottle feeding.[4,7,8] Also discuss compliance with antibiotics if prescribed. See the *Parent's Guide to Ear Infections in Children* for more parent education.

Recommendation 3: Antibiotics for AOM[1,3]

Treat as per Table 1 if the child is:
- younger than 24 months and has not been treated for AOM in the last six weeks; or
- older than 24 months and 48 to 72 hours of symptomatic treatment failed.

Table 1. Initial Treatment of AOM*

Antibiotic of choice:	Amoxicillin	80 mg/kg/day PO div tid for 5 days
Recommended alternative for penicillin allergic patients:	Erythromycin-sulfisoxazole	40 mg/kg/day PO div tid (based on erythromycin) for 10 days

* Maximum dose should not exceed adult dose.

Treat as per Table 2 if:
- AOM recurs within six weeks; or
- the child still has signs and symptoms of AOM after 48 to 72 hours of treatment with initial antibiotics.

Table 2. Treatment Failure*

Antibiotic options:	Amoxicillin – clavulanate	40 mg/kg/day PO div tid (based on amoxicillin) for 10 days
	Clarithromycin	15 mg/kg/day PO div bid for 10 days

*Maximum dose should not exceed adult dose.

Note: Agents not recommended for AOM: Cephalexin, Cefaclor, Erythromycin, Quinolones

Recommendation 4: Follow-up of AOM

- Re-examine child if he/she is not improving within 48 to 72 hours, develops complications or perforation occurs.
- A follow-up examination of the ear is not required immediately after antibiotic treatment if the child appears to have recovered.
- If perforation occurs, the patient or family should be told it is not a serious complication. Water and objects such as cotton tip swabs should be kept out of the ear canal. Follow-up in six weeks.
- Evaluation for OME may be required approximately three months after the episode of AOM (see OME guideline), especially if a hearing problem is suspected.

Recommendation 5: Referral to otolaryngologist (ENT surgeon)

Refer to an otolaryngologist urgently if complications such as facial paralysis or mastoiditis occur.

Refer to an otolaryngologist electively if three or more episodes of AOM occur in six months or four episodes of AOM occur in 12 months.

Do not refer to an otolaryngologist for a simple rupture of the tympanic membrane. Manage as for AOM. Refer to an otolaryngologist if the perforation does not heal in six weeks.

Rationale

Children with craniofacial abnormalities, immune deficiencies, complications of AOM (e.g. mastoiditis, facial paralysis, etc.), or serious underlying disease are not covered by this guideline. These individuals are at high risk for head and neck complications and should be co-managed by their doctor and an otolaryngologist.

Most data on the management of AOM are derived from studies on children between the ages of three months to three years, however the ages included in this guideline have been broadened.[1]

Twenty to 30 per cent of episodes of AOM are caused by viruses.[1,3,5,8] Determining which cases of AOM are caused by bacteria is often challenging. Studies over the years have used various criteria to establish the diagnosis, the gold standard being culture of the fluid obtained by tympanocentesis. This technique, however, alters the natural history of the disease process. Specific clinical diagnostic criteria that do not interfere with the disease process are hard to define. Redness of the tympanic membrane and fever are not strongly associated with AOM.[2] Pneumatic otoscopy can be a useful clinical skill to help detect the presence of fluid behind the tympanic membrane[1]; however, the pressure applied to an already taut tympanic membrane may worsen the pain in a child with an acutely painful ear.

Spontaneous resolution of otitis media is to be expected in approximately 80 per cent of children.[8] Between 7 and 20 children must be treated with antibiotics to effect one cure. A greater percentage of children who receive antibiotics experienced side effects such as vomiting, diarrhea and rash than those who receive placebo.[9]

Most episodes of AOM resolve spontaneously.[3,4,5,10] Otitis media with effusion (OME) often follows an episode of AOM and usually has spontaneously resolved within three months.[1,8] Transient hearing loss is frequently associated with OME. Permanent hearing loss can complicate AOM and OME and should be considered in any child failing to meet appropriate language milestones, or loss of language skills. Perforation of the tympanic membrane allows the fluid to drain from the middle ear and often hastens the healing process. Rarely, meningitis, facial paralysis, and mastoiditis complicate an episode of AOM and require urgent medical or surgical interventions.

All children with a diagnosis of AOM should receive proper doses of an appropriate analgesic[1] (not ASA) and other supportive measures as deemed necessary, e.g. fluids, rest.

Children under the age of 24 months with AOM should receive antibiotics because they are at increased risk of complications.[1,3,4,5,6] Over the age of 24 months, antibiotics can often be withheld and only offered to children who are still symptomatic after 48 to 72 hours of supportive treatment or those who deteriorate without antibiotic treatment.[1,3,4,5,6]

Bacterial AOM is usually caused by *S. pneumoniae,* non-typable *H. influenzae, M. catarrhalis,* Group A streptococcus, and *S. aureus.*[1] Amoxicillin is the first antibiotic choice for treatment of AOM in children without a penicillin allergy.[3] The increasing use of more broad spectrum antibiotics in the treatment of AOM should be discouraged due to the increased risk of promoting antibiotic resistance.[5,11]
The new pneumococcal 7-valent conjugate vaccine is expected to reduce the prevalence of otitis media. Recent guidelines from the American Pediatric Society recommend 80 mg/kg amoxicillin per day as initial therapy for 5 days.[12] This higher dose for a shorter time period is expected to reduce antibiotic resistance.

References

1. Alberta Medical Association. Guideline for the diagnosis and treatment of acute otitis media in children. Alberta Clinical Practice Guidelines Program 2000.
2. Pichichero ME. Acute otitis media: Part I. Improving diagnostic accuracy. *Am. Fam. Phys.* 2000;61:2051-6.
3. Canadian Paediatric Society. Antibiotic management of acute otitis media. Clinical Practice Guideline ID 97-03. *Paediatrics Child Health* 1998;3:265-267.
4. Agency for Healthcare Research and Quality. Management of acute otitis media: summary. June 2000. http://www.ahcpr.gov/clinic/epcsums/otitisum.htm
5. Walsh RM, Bath AP, Hawke M, Rutka JA. Acute otitis media: four out of five kids *Can J Diag* 1999;16:106-121.
6. Ipp M. New evolving strategies for the management of acute otitis media. Pediatrics Child Health 1999;4:451-457. http://www.pulsus.com/Paeds/04_07/ipp_ed.htm
7. Niemela M, Pihakari O, Pokka T, Uhari M, Uhari M. Pacifier as a risk factor for acute otitis media: a randomized, controlled trial of parental counselling. *Pediatrics* 2000;106:483-488.
8. Rosenfeld RM, Bluestone CD. Evidence-based otitis media. Hamilton, Ont: BC Decker Inc; 1999.
9. Del Mar CB, Glasziou PP, Hayem M. Are antibiotics indicated as initial treatment for children with acute otitis media? A meta-analysis. *BMJ* 1997;314:1526-1529.
10. O'Neill P. Clinical evidence: Acute otitis media. *BMJ* 1999;319:833-835.
11. Antibiotic Resistance Education Project. Protecting patients from antimicrobial resistance: the role of the family physician. Vancouver (BC): University of British Columbia; February 1999. 604 875-2438.
12. American Academy of Pediatrics. Diagnosis and Management of Acute Otitis Media. *Pediatrics* 2004; 113:1451-1465.

Sponsors

This guideline was developed by the Guidelines and Protocols Advisory Committee, approved by the British Columbia Medical Association and adopted by the Medical Services Commission.

Funding for this guideline was provided in full or part through the Primary Health Care Transition Fund.

Effective Date: October 1, 2004

This guideline is based on scientific evidence current as of the effective date.

Guidelines and Protocols Advisory Committee
1515 Blanshard Street 2-3
Victoria BC V8W 3C8
Phone: (250) 952-1347
Fax: (250) 952-1417
E-mail: hlth.guidelines@gems6.gov.bc.ca
Web site: www.healthservices.gov.bc.ca/msp/protoguides

The principles of the Guidelines and Protocols Advisory Committee are:

- to encourage appropriate responses to common medical situations
- to recommend actions that are sufficient and efficient, neither excessive nor deficient

G&P2004-090

Ear Infection in Children

A Guide for Parents

What causes an ear infection?

Ear pain often occurs in children between three months and three years, but it can occur at any age. Fluid often builds up in the middle ear because the eustachian tube can become easily blocked in young children. This may lead to ear discomfort. Bacteria and viruses can invade this fluid, causing intense ear pain due to pressure on the eardrum. This type of infection is called acute otitis media (AOM).

What should I do if my child has a sore ear?

If your child is *under three months old* and appears ill, seek **immediate** medical attention.

If your child is *under two years old,* see your doctor within 24 hours for an assessment. Your doctor will provide you with advice on pain control and treatment options.

If your child is *over two years old,* ear infections often disappear on their own within 48 hours. Sometimes, all that you need to do is give your child something for the pain.

Note: If your child is getting worse **or** not improving within 48 hours, see your doctor.

How can I help ease the pain from an ear infection?

An adequate dosage of painkiller is an important part of helping a child with ear pain. Over-the-counter medicines, such as acetaminophen (e.g. Tylenol) or ibuprofen (e.g. Advil), should be used according to product instructions or the advice of your doctor or pharmacist. Aspirin should not be used in children.

What factors increase my child's risk of having ear problems?

Factors that increase your child's risk of ear problems include:

- Exposure to second-hand smoke
- Using a pacifier
- Drinking from a bottle while lying down
- Attending daycare

What if my child's ear problem continues?

If your child continues to have ear problems for longer than three months, has significant hearing loss, or repeated ear infections, your doctor may refer your child to an otolaryngologist (ear, nose, and throat specialist).

Additional Information:

The changes in air pressure that happen when you fly can cause pain and it is better for children with ear problems to avoid air travel.

If your child has an ear infection, he or she will often experience temporary hearing reduction. This may lead to changes in your child's behaviour such as being unresponsive to quiet sounds or being inattentive, even several weeks after the pain has gone away.

BRITISH COLUMBIA MEDICAL ASSOCIATION

BCHealthServices

G&P2004-090