



“Ear”rational Child?



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Emily's Case

Emily's mother, Catherine, received a phone call from her daughter's day care stating that “Emily didn't seem herself and felt warm to the touch.” Emily, who is 26-months-old, subsequently presented to the Emergency Department with a fever of 38.6°C, and she was tugging/pulling at her right ear. Emily reportedly had had a cold for the past three days.

Upon examination, Emily's tympanic membranes bilaterally were found to be erythematous, fluid-filled, opaque, and bulging.

[Read on for more on Emily.](#)

infections without AOM.² While clinical history alone tends to be a poor predictor of AOM, it can be used to identify risk factors, including young age, daycare attendance, bottle-feeding, pacifier use, orofacial abnormalities, immunodeficiency, and exposure to second-hand smoke.^{1,3}

2. What are the criteria for the diagnosis of AOM?

To make a diagnosis of AOM, clinicians should assess three criteria:¹

1. Acute onset
2. Presence of a middle ear effusion (bulging or reduced mobility of the tympanic membrane, an air-fluid level behind the tympanic membrane, and/or otorrhea)
3. Signs and symptoms of middle ear inflammation (tympanic membrane erythema or definite otalgia that either disrupts sleep or normal activity)

Severe presentations include those children that appear septic, have severe otalgia, and/or a fever of greater than 39°C orally.^{1,3}

3. Who should get treated with antibiotics?

Since many cases of AOM are bacterial, antibiotics seem like a simple answer.

Questions and Answers

1. What are the common symptoms of acute otitis media?

Acute otitis media (AOM), also known as suppurative otitis media, is the most frequently cited diagnosis in febrile children. AOM commonly arises concurrently with, or subsequent to, an upper respiratory tract infection. Classically, AOM is heralded by the rapid onset of otalgia, irritability, otorrhea, and/or fever.¹ For nonverbal or preverbal children, ear rubbing is commonly believed to be associated with infection of the middle ear. However, a recent study found that these classic symptoms were not predictive of AOM when compared to a similar group of children that had respiratory tract

Table 1

Canadian Paediatric Society's Watchful Waiting Criteria

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"> Older than six months of age Parents are capable of recognizing signs of worsening illness and can readily access medical care 	<ul style="list-style-type: none"> History of complicated AOM Children with immunodeficiency, chronic cardiac or pulmonary disease, orofacial abnormalities, or Down's syndrome Severe illness presentation First Nations and Aboriginal children

However, approximately fifteen children must be treated with antibiotics for a single child to achieve clinical cure at 48 hours, and 2,500 children would have to be treated to prevent one case of mastoiditis.³ Since many children experience a resolution of symptoms without antibiotics, the Canadian Paediatric Society Guidelines recommend a 48 to 72 hour watchful waiting approach in select patients (Table 1).³ The Clinical Practice Guidelines set out by the American Academy of Pediatrics and the American Academy of Family Physicians differ slightly where management of AOM is based on age and the certainty of the diagnosis. When deciding to delay the administration of antibiotics, it must be

assured that appropriate follow-up is provided with clinical reassessment if symptoms fail to resolve; the provision of a deferred prescription to be filled at the caregiver's discretion is an option in cases where antibiotic administration is delayed.³

4. What is the appropriate treatment of AOM?


Amoxicillin remains the antibiotic of choice for treating AOM in children without beta-lactam allergies. In cases where symptoms persist two to three days after the initiation of therapy, amoxicillin clavulanate is recommended (Table 2).³ The optimal duration of treatment and the

Table 2

Canadian Paediatric Society Guidelines for Antimicrobial Therapy for AOM

Treatment Type	Recommended Prescriptions
First-line treatment	<ul style="list-style-type: none"> <i>Amoxicillin</i> 75 to 90 mg/kg per day divided twice per day
Second-line treatment	<ul style="list-style-type: none"> <i>Cefprozil</i> 30 mg/kg per day divided twice per day <i>Cefuroxime axetil</i> 30 mg/kg per day divided twice per day <i>Ceftriaxone</i> 50 mg/kg intramuscularly (or intravenously) x 1 dose <i>Azithromycin</i> 10 mg/kg once per day x 1 dose, then 5 mg/kg once per day x 4 doses <i>Clarithromycin</i> 15 mg/kg per day divided twice per day
Initial treatment failure	<ul style="list-style-type: none"> <i>Amoxicillin-clavulanate</i> 90 mg/kg per day amoxicillin, 6.4 mg/kg per day clavulanate divided twice per day for 10 days

decision of whether or not treatment should be altered according to patient age remains controversial. The Canadian Paediatric Society Guidelines recommend five days as an appropriate duration of treatment for patients with mild to moderate AOM, reserving 10 day courses of antimicrobial therapy for children younger than two years of age, those with a history of complicated AOM, and those experiencing initial treatment failure.^{3,4} In contrast, the Clinical Practice Guidelines of the American Academy of Pediatrics and American Academy of Family Physicians advise a standard 10 day course of antimicrobial therapy for patients younger than six years of age and those with severe illness.¹ A Cochrane Review by Kozyrskyj, Klassen, Moffat, *et al* indicated that the rate of treatment failure is higher when a short course (< 7 days) of antibiotics is prescribed when compared with a longer course (> 7 days).⁵

Also, in contrast with the Canadian Guidelines, recent evidence suggests that antibiotic therapy is beneficial in patients aged 6 to 36 months of age. This study also highlights the value of analgesia, irrespective of the decision to prescribe antibiotics.⁶ Ibuprofen and acetaminophen have been found to be equally effective analgesics for this purpose.⁷ 

Back to Emily

Emily was given a prescription for amoxicillin 500 mg p.o., b.i.d. for five days. Use of acetaminophen or ibuprofen was suggested to treat Emily's pain. Catherine was further advised to see her family doctor or return to the ED if Emily's fever and/or pain persisted 48 hours after the administration of antibiotics or if she developed swelling or pain behind her ear.

References

1. American Academy of Pediatrics and American Academy of Family Physicians: Diagnosis and Management of Acute Otitis Media. *Pediatrics* 2004; 113(5):1451–1465.
2. Laine MK, Tähtinen PA, Ruuskanen O, *et al*: Symptoms or Symptom-based Scores Cannot Predict Acute Otitis Media at Otitis-prone-age. *Pediatrics* 2010; 125(5):1154–1161.
3. Forgie S, Zhanel G, Robinson J: Management of Acute Otitis Media — A Summary. *Paediatr Child Health*; 14(7):457–460.
4. Hoberman A, Paradise JL, Rockette HE, *et al*: Treatment of Acute Otitis Media in Children under 2 Years of Age. *N Engl J Med* 2011; 364(2):105–115.
5. Kozyrskyj AL, Klassen TP, Moffat M, *et al*: Short-course Antibiotics for Acute Otitis Media (Review). *The Cochrane Database Syst Rev* 2010; (9): n.p.
6. Tähtinen PA, Laine MK, Huovinen P, *et al*: A Placebo-controlled Trial of Antimicrobial Treatment for Acute Otitis Media. *N Engl J Med* 2011; 364(2):116–126.
7. Bertin L, Pons G, d'Athis P, *et al*: A Randomized, Double-blind, Multicentre Controlled Trial of Ibuprofen versus Acetaminophen and Placebo for Symptoms of Acute Otitis Media in Children. *Fundam Clin Pharmacol* 1996; 10(4):378–39.

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