RACGP
Royal Australian College of General Practitioners

For GPs - Antibiotic use for acute otitis media in children

For GPs

The role of antibiotic prescription in treating acute otitis media and preventing its complications.

RACGP position

Most children with acute otitis media (AOM) will not require antibiotic therapy.[1] The mainstay of AOM management is oral analgesia.[2]

Traffic lights

Red – Do not take this action

- Do not routinely commence antibiotics for AOM in children aged ≥6 months who do not have clinical features that place them at increased risk.[2,3]
- Do not routinely use decongestants, antihistamines or oral prednisolone for acute otitis media.[2–4]

Orange – Under specified circumstances, take this action

- Adopt a watchful waiting (or delayed prescribing) approach, with follow-up within 48–72 hours.[1,2,5,6] This is a reasonable alternative to antibiotics.

Green – Take this action

- Complete a targeted examination to exclude other conditions, particularly meningitis and mastoiditis.[2,3]
- Treat ear pain with age- and weight-appropriate therapeutic doses of oral analgesia (eg paracetamol, ibuprofen).[2,3,6,7]
- Explain that the usual course of AOM is about three days but can be up to one week.[1,2]
- Prescribe antibiotics for patients with high risk factors, including:[2,3,5,6]
  - children who are systemically unwell (lethargic, pale, very irritable)
  - children aged <6 months
  - children aged <2 years with bilateral AOM

- Aboriginal and Torres Strait Islander children at high risk, specifically those:
  - aged <2 years
  - whose first episode of otitis media occurred when they were aged <6 months
  - who have persistent or recurrent middle ear problems
  - who live in remote communities or in areas with high rates of chronic suppurative otitis media.

✓ Consider prescribing antibiotics for children who have:[2,3,5,6]
- a cochlear implant
- a history of recurrent AOM (more than three acute episodes in the previous 12 months)
- a history of chronic suppurative otitis media
- craniofacial abnormalities, including cleft palate
- Down Syndrome or other developmental delays
- only one hearing ear
- immunodeficiency.

✓ Use a shared decision-making approach where you and the patient/carer discuss and consider the benefits and harms of treatment options, including antibiotics.

Patient harms and risks

Studies of children with AOM (where some were treated with immediate antibiotics and some received a placebo) indicate that antibiotics:[1]

- do not reduce pain at 24 hours (which is when 60% of children recover or improve)
- may reduce pain at 2–3 days, but probably do not reduce the risk of pain after that.

For every 100 children treated with antibiotics:[7]

- only five additional children will be better at 2–3 days as a result of taking antibiotics
- the duration of symptoms is shortened by an average of only 12 hours.

In addition to its limited effect, antibiotic therapy for AOM can cause harm, including:[1,2]

- diarrhoea
- vomiting
- rash or more serious hypersensitivity reactions
- bacterial resistance in the patient and their household
- contribution to antimicrobial resistance at a community level.

For every 14 children treated with antibiotics, one child experienced an adverse event (such as vomiting, diarrhoea or rash) that would not have occurred if antibiotics were withheld.[1]

Overview

Definition and symptoms

AOM is an infection of the middle ear space that can be viral, bacterial or coinfection. The most common bacterial organisms causing otitis media are *Streptococcus pneumoniae*, *Haemophilus influenzae* and *Moraxella catarrhalis*.[7]

Regardless of the causative organism, most AOM is self-limiting.[2]

AOM can occur at any age, but is most common in children aged 6–24 months.

Risk assessment

When treating a child with symptoms of AOM, first:

- exclude serious conditions that could either be the cause or be masked by AOM, such as acute mastoiditis and meningitis
- identify if they are at high risk.

Refer to 'Red flags' for further details.

Antibiotic therapy

Pharmaceutical Benefits Scheme (PBS) data shows that the highest rate of antibiotic dispensing for patients aged <65 years is for children aged 2–4 years.8,9 AOM is one of the most common diseases in childhood for which antibiotics are prescribed.[1]

For children with AOM who are not at high risk, antibiotic therapy has a limited benefit[1,2,7] because:

- initial antibiotic therapy does not improve pain at 24 hours
- most children will be better after about four days without taking antibiotics, and for every 100 children treated with antibiotics, only five additional children will be better at 2 to 3 days as a result of taking antibiotics
- antibiotics shorten the duration of symptoms by an average of about only 12 hours.

A 2023 Cochrane systematic review found that:[1]

- compared to a placebo, antibiotics did slightly reduce the number of children who developed perforations of the eardrum and the number of children who developed AOM in the ear that was initially unaffected
- antibiotics reduced the number of children with abnormal tympanometry findings at two to four weeks, but not after six to eight weeks, nor at three months
- there was not enough information to determine if antibiotics reduced the occurrence of rare complications such as mastoiditis (infection of the bones around the ear)
- antibiotics caused unwanted effects such as diarrhoea, vomiting and rash.

The review concluded that it is difficult to balance the small benefits against the small harms of antibiotics in children with AOM, and that for most children with mild disease in high-income countries, a watchful waiting approach seems justified.

Red flags

There are several serious conditions that may cause or be masked by AOM, including acute mastoiditis, meningitis, intracranial abscess, sinus thrombosis and facial nerve paralysis.[2]

Further research is needed to determine if it is possible to predict which children are more likely to suffer from the complications of AOM.[1]

Acute mastoiditis

While acute mastoiditis is rare,[2] you need to be alert to its symptoms, which include:[10]

- pain, soreness or tenderness behind the ear
- redness behind the ear, which can be harder to detect on brown or black skin
- swelling behind the ear, which can cause the ear to stick out
- discharge from the ear

- a high temperature
- tiredness and irritability
- headache
- hearing loss in the affected ear.

If you suspect acute mastoiditis, arrange a prompt referral to hospital for review and IV antibiotics +/– surgical intervention.

Alternatives – what can I do for the patient?

Treatment strategies

Shared decision making

Use a shared decision-making approach to treatment and reassure the parent/carer that their child is unlikely to require antibiotic therapy if they are not in a high-risk group. Explain the potential benefits and potential harms of antibiotic treatment, as well as what they should do if their child continues to feel unwell or gets worse.

Consider encouraging the parent/carer to read First do no harm's patient resource, 'Antibiotics for middle ear infections (acute otitis media)'.

Watchful waiting

To implement watchful waiting effectively:[11]

- advise the parent/carer about symptoms they should look out for, especially red flags (listed above)
- advise the parent/carer that if there are ear symptoms, persistent irritability or hearing concerns after 2–3 months, they should arrange a medical review to check for persistent effusion3
- reassure the parent/carer that they can take time to think about the information you have given them and return if they have concerns
- consider delayed prescribing for antibiotics, advising the parent/carer to fill the prescription only if the child does not improve or gets worse after three days.[2]

Use of analgesia

The main treatment of AOM is the use of regular age- and weight-appropriate doses of oral analgesia (eg paracetamol or ibuprofen).[1–3,6] This is recommended, whether or not you also prescribe antibiotics.[6]

In children aged >3 years, there is limited evidence of additional benefit from topical anaesthetic eardrops.[12,13]

Also advise the parent/carer to:

- keep their child as comfortable as possible (eg place a warm cloth on the ear to help relieve the pain[14])
- use distraction techniques to help their child focus on other things (eg put on their favourite movie, provide colouring books, toys, board games the child enjoys[15–17]).

Preventive action

Encourage the parent/career to consider preventive actions that can prevent occurrence or recurrence of AOM. These include:[5]

- keeping influenza and pneumococcal vaccinations up to date
- avoiding exposure to passive smoking
- limiting the use of dummies, especially after age six months
- breastfeeding exclusively for at least the first six months.

Resources and information for patients

RACGP, Antibiotics for acute otitis media

Better Health Victoria, Ear infections

National Institute for Health and Care Excellence, Otitis media (acute): Antimicrobial prescribing

Australian Commission on Safety and Quality in Health Care, Middle ear infection: Should my child take antibiotics?

Healthdirect, Otitis media (middle ear infection)

Healthdirect, Medicines for babies and children

Australian Government, Antimicrobial resistance: How does AMR affect you?

Resources and GPs

The Royal Australian College of General Practitioners, *Guidelines for preventive activities in general practice* (Red Book): Hearing

The Royal Australian College of General Practitioners, *Handbook of non-drug interventions*: Autoinflation for glue ear in children

The Royal Australian College of General Practitioners, *Handbook of non-drug interventions*: Probiotics for the prevention of antibiotic-associated diarrhoea in adults and children

The Royal Australian College of General Practitioners, Position statement: Antibiotic stewardship

Menzies School of Health Research, *2020 Otitis Media Guidelines for Aboriginal and Torres Strait Islander Children*

National Institute for Health and Care Excellence, Otitis media (acute): Antimicrobial prescribing

Therapeutic Guidelines, Antibiotic

Associated topic

Managing uncertainty

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