

Acute Otitis Media in Children

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Note:

This guideline provides advice of a general nature. This statewide guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. The guideline is based on a review of published evidence and expert opinion.

Information in this statewide guideline is current at the time of publication.

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Health practitioners in the South Australian public health sector are expected to review specific details of each patient and professionally assess the applicability of the relevant guideline to that clinical situation.

If for good clinical reasons, a decision is made to depart from the guideline, the responsible clinician must document in the patient's medical record, the decision made, by whom, and detailed reasons for the departure from the guideline.

This statewide guideline does not address all the elements of clinical practice and assumes that the individual clinicians are responsible for discussing care with consumers in an environment that is culturally appropriate and which enables respectful confidential discussion. This includes:

- The use of interpreter services where necessary,
- Advising consumers of their choice and ensuring informed consent is obtained,
- Providing care within scope of practice, meeting all legislative requirements and maintaining standards of professional conduct, and
- Documenting all care in accordance with mandatory and local requirements

Explanation of the aboriginal artwork.

The aboriginal artwork used symbolises the connection to country and the circle shape shows the strong relationships amongst families and the aboriginal culture. The horse shoe shape design shown in front of the generic statement symbolises a woman and those enclosing a smaller horse shoe shape depicts a pregnant woman. The smaller horse shoe shape in this instance represents the unborn child. The artwork shown before the specific statements within the document symbolises a footprint and demonstrates the need to move forward together in unison.



Cultural safety enhances clinical safety.

To secure the best health outcomes, clinicians must provide a culturally safe health care experience for Aboriginal children, young people and their families. Aboriginal children are born into strong kinship structures where roles and responsibilities are integral and woven into the social fabric of Aboriginal societies.

Australian Aboriginal culture is the oldest living culture in the world, yet Aboriginal people currently experience the poorest health outcomes when compared to non-Aboriginal Australians.

It remains a national disgrace that Australia has one of the highest youth suicide rates in the world. The over representation of Aboriginal children and young people in out of home care and juvenile detention and justice system is intolerable.

The cumulative effects of forced removal of Aboriginal children, poverty, exposure to violence, historical and transgenerational trauma, the ongoing effects of past and present systemic racism, culturally unsafe and discriminatory health services are all major contributors to the disparities in Aboriginal health outcomes.

Clinicians can secure positive long term health and wellbeing outcomes by making well informed clinical decisions based on cultural considerations.

The term 'Aboriginal' is used to refer to people who identify as Aboriginal, Torres Strait Islanders, or both Aboriginal and Torres Strait Islander. This is done because the people indigenous to South Australia are Aboriginal and we respect that many Aboriginal people prefer the term 'Aboriginal'. We also acknowledge and respect that many Aboriginal South Australians prefer to be known by their specific language group(s).

Purpose and Scope of PCPG

To provide a clinical practice guideline for the management of acute otitis media in children.

Exclusions

- > This guideline does not deal specifically with the management of acute otitis media or its complications in Aboriginal and Torres Strait Islander Populations. For clinical care guidelines on the “Management of Otitis Media in Aboriginal and Torres Strait Islander Populations” follow link to the Department of Health and Ageing website
<http://www.health.gov.au/internet/main/publishing.nsf/Content/indigenous-otitismedia-clinical-care-guidelines>.
- > This guideline will not discuss the management of complications of acute otitis media; however it will refer to how to diagnose them, as well as appropriate referral and disposition of such patients.

Flowchart: Suggested antibiotic usage for acute otitis media

Diagram 1: Commencing antibiotics

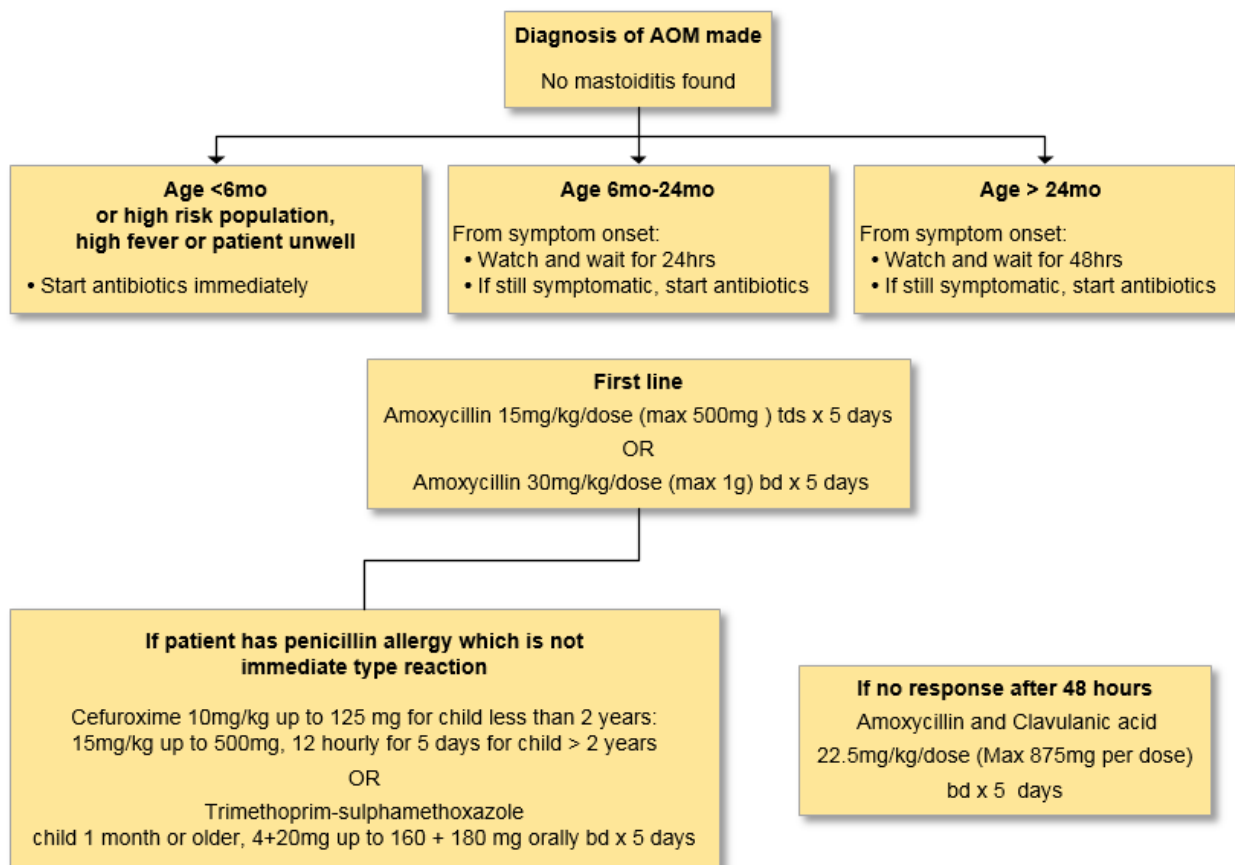


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Summary of Practice Recommendations

- > Acute otitis media (AOM), a common condition in children, is a closed space inflammatory process in the middle ear. It is more frequent in the first 2 years of life, due to the immaturity of immunologic defenses and to the Eustachian tube's function and structure.
- > Diagnosis is based on the presence of a triad of clinical signs.
- > Management includes analgesia as well as possible antibiotic use.
- > Age is important in determining whether a child can have delayed antibiotic management.
- > First line antibiotic therapy is Amoxicillin. Poor response to amoxicillin may occur due to increasing resistance of causative bacteria. Amoxicillin with clavulanic acid (Augmentin Duo[®]) provides better coverage of *Haemophilus influenzae* and *Moraxella catarrhalis* and additionally, a three times daily (tds) dosing instead of the standard twice daily (bd) dosing increases antibiotic activity, which is required in children.



Abbreviations

AOM	Acute otitis media
OME	Otitis media with effusion
URTI	Upper respiratory tract infection
bd	Twice daily
ENT	Ear, nose and throat
hrs	Hours
IV	Intravenous
kg	Kilogram(s)
mg	Milligrams
mL	Millilitre(s)
mo	Months
tds	Three times a day

Definitions

Acute otitis media	Inflammation of the middle ear in which there is fluid in the middle ear accompanied by signs or symptoms of ear infection: a bulging eardrum usually accompanied by pain; or a perforated eardrum, often with drainage of purulent material (pus)
Otitis media with effusion	A collection of non-infected fluid in the middle ear space. Also known as serous otitis media and glue ear.
Bullous myringitis	An infection of the tympanic membrane characterised by the presence of fluid filled blisters and severe pain.

Acute otitis media in children

Causes

- > Viral (25%)
- > *Streptococcus pneumoniae* (35%)
- > Non-typable strains of *Haemophilus influenzae* (25%)
- > *Moraxella catarrhalis* (15%)

Clinical signs and symptoms

- > AOM diagnosis requires the following triad of symptoms:
 - Rapid onset of symptoms e.g. earache, ear tugging, irritability
 - Middle ear effusion as evidenced by a bulging immobile tympanic membrane or fluid behind the tympanic membrane. Pneumatic otoscopy if available is recommended.
 - Acute inflammation, as evidenced by erythema of the tympanic membrane

The presence of a bulging, immobile red ear drum has a positive predictive value of 83-99%.

Assessment often finds the child presenting with other viral URTI signs. Thus, a diagnosis of AOM can only be made after actively looking for signs of this disease.

Otitis Media

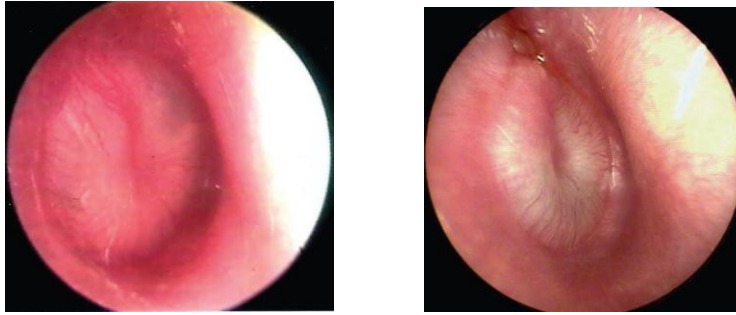


Image 1 & 2: Bulging tympanic membranes with thick mucopurulent effusions

Management

- > There is no evidence that antihistamines, decongestants, or corticosteroids have any place in AOM management.

Analgesia:

- > Pain relief is essential for AOM. The following analgesics can be utilized:
 - o First line: Paracetamol 15mg/kg/dose
 - o If unsuccessful, consider ibuprofen 10mg/kg/dose
- > NICE¹⁴ guidelines and RCH¹³ for AOM have more information on analgesia
- > If pain not relieved, consider adding topical anaesthetic and consider whether this reflects a complication such as otitis externa or mastoiditis.

Commencing Antibiotics (See [Diagram 1](#)):

Start immediately

- > All symptomatic children aged <6 months
- > Symptomatic high risk groups e.g. aboriginal population, immune suppressed
- > Symptoms such as fever or vomiting or child is unwell, whilst looking for other causes of illness

Well children 6-24 months

- > Give pain relief and observe for 24 hours from time of symptom onset. "Watch and Wait" for 24 hours before starting antibiotics.

Well children aged >24 months

- > Give pain relief and observe for 48 hours from time of symptom onset. "Watch and Wait" for 48 hours before starting antibiotics.

It is recommended that, when compared with an immediate antibiotic prescribing strategy, a watchful waiting approach (delayed strategy) for acute otitis media reduces consumption of antibiotics, the intention being to consult a doctor for future episodes and the likelihood of adverse effects (mainly diarrhoea). It does not appear to increase the long term risks of mastoiditis, recurrent earache, or hearing problems. The cost however is a delay in recovery of symptoms by an average of one day, increased analgesic requirements and a small reduction in parental satisfaction with treatment. (NHS evidence. Clinical knowledge summaries-otitis media-acute-evidence).

The practice of providing a prescription for delayed dispensing of antibiotics following parent observation is not recommended.

Oral antibiotic choices:

First line therapy:

- > Amoxicillin 15mg/kg/dose (up to 500mg) 8 hourly **OR** (for patients suspected to be nonadherent) 30mg/kg/dose (up to 1g) 12 hourly orally for 5 days. For suspension formulation, always round up the dose to the nearest mL increment.

Penicillin hypersensitivity (excluding immediate hypersensitivity):

- > cefuroxime (child 3 months to 2 years: 10 mg/kg up to 125 mg; 2 years or older: 15 mg/kg up to 500 mg) orally, 12-hourly for 5 days, round up dose to the nearest mL increment.

Penicillin immediate hypersensitivity (anaphylaxis, airway compromise)

- > trimethoprim + sulfamethoxazole (child 1 month or older) 4+20 mg/kg up to 160+800 mg orally, 12-hourly for 5 days.
- > Azithromycin 10 mg/kg up to 500 mg orally, daily for 5 days

Note Macrolide antibiotics have a higher rate of treatment failure, particularly for azithromycin, and are more expensive

Clinicians are advised to refer to the ASCIA website for more information about immediate hypersensitivity reactions and management:

<https://allergy.org.au/hp/anaphylaxis/>

Poor response to therapy:

- > Patients who have an inadequate response to amoxicillin therapy within 48 to 72 hours may have infection caused by a beta-lactamase-producing strain of *H. influenzae* or *M. catarrhalis*; adding clavulanate provides increased activity against these pathogens.
- > Amoxicillin+clavulanate 22.5mg/kg (Max 875mg per dose), 12 hourly for 5 days.

Note Warn the parent that there is a high incidence of concomitant diarrhoea, which is not an allergy.

- > If the patient cannot tolerate oral antibiotics (persistent vomiting) consider referral to local admitting paediatric service for IV antibiotics.

Ongoing management

- > The criteria for referral to an ENT specialist (as an outpatient) depends on the age of the child and the severity of each acute otitis media episode (e.g. more than 6 episodes in a 12 month period).

Complications

Tympanic membrane rupture

- > Due to the pressure in the middle ear creating ischaemia of the bulging tympanic membrane which subsequently perforates.
- > Clinically the child has a sudden loss of otalgia, but now has bloody discharge from the ear.
- > Treatment is the same as for standard AOM with the addition of toileting the discharge with rolled tissue spears 6 to 8 hourly prior to the instillation of topical drops where used.
- > Should the discharge not resolve within 7 days, an ENT surgeon's opinion should be sought.



Image 3: Tympanic membrane perforation with tympansclerosis.

Acute mastoiditis

- > A serious, albeit rare complication of acute otitis media.
- > Patients present with otalgia, periauricular swelling and erythema, particularly post auricular which causes the pinna of the ear to be pushed forward.
- > The infection spreads to cause purulent destruction of the mastoid bone.
- > All patients presenting with this need an urgent ENT consult for advice on imaging and further management.

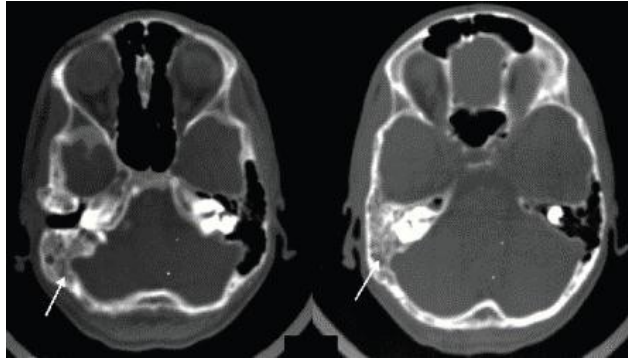


Image 4 & 5: Acute mastoiditis shown on CT and clinically

Chronic otitis media with effusion

- > Also known as serous otitis media or 'glue ear'. Self-resolving OME is frequent following upper respiratory tract infections and following resolution of acute otitis media.
- > Persistence of the effusion for more than 3 months indicates the condition has become chronic.
- > The causes are multifactorial, and may include infection, persistent use of a baby pacifier and parental smoking.
- > Referral to an ENT surgeon is recommended if the following are present:
 - o effusion lasting less than 3 months in the setting of speech delay or educational handicap.
 - o effusion lasting more than 3 months and audiometry showing bilateral hearing loss.
 - o structural damage to the tympanic membrane (significant retraction, cholesteatoma).



Image 6: Air fluid levels behind drum in serous otitis media

Bullous myringitis

Cause

- > Believed to be primarily viral, however *Mycoplasma* has been identified in some cases.

Physical examination

- > Auriscope examination reveals bulla(e) on the tympanic membrane that is(are) filled with serous or serosanguineous fluid. The ear canal may be affected as well.
- > Risk of spontaneous rupture.

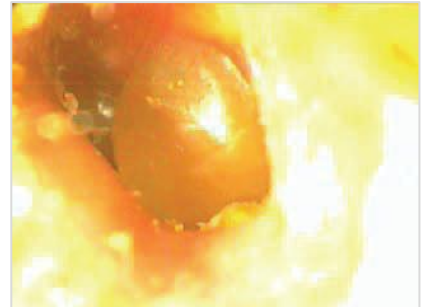


Image 7: Bullous myringitis

Treatment

- > Analgesics
- > Azithromycin 10 mg/kg up to 500 mg orally, daily for 5 days.

Infected tympanostomy tubes (grommets)

- > Children will have a history of tympanostomy tube insertion (grommets) and a discharging ear (otorrhoea).



Image 8: Before tube insertion

Image 9: After tube insertion

Cause

The most common associated pathogens are *Streptococcus pneumoniae* and *Haemophilus influenzae*.

In cases where the discharge is smelly or green, *Pseudomonas* infection is more likely.

Treatment

First line therapy is the use of non-ototoxic topical drops, e.g. ciprofloxacin drops 0.3% 5 drops instilled 12 hourly until the middle ear has been free of discharge for at least 3 days.

Aminoglycoside drops have previously been used for discharging grommets and CSOM (chronic suppurative otitis media) however due to concerns about their safety, in particular the risk of ototoxicity and the availability of non-ototoxic quinolone drops, the latter are now preferred.

If potentially ototoxic drops are prescribed informed consent is recommended.

In the absence of significant systemic illness, oral antibiotics are not required.

If discharge fails to settle, consider a swab and further therapy directed by results.

References

1. Acute Otitis Media (revised 2018 Jul) In: eTG complete [Internet]. Melbourne: Therapeutic Guidelines Limited; Jul 2018 edition. Url: <https://tgldcdp.tg.org.au/etgcomplete>
2. Kmietowicz, Z. Most cases of otitis media should not be treated with antibiotics, says NICE. *BMJ* 2017;358:j4398 doi: 10.1136/bmj.j4398 (Published 2017 September 22)
3. NICE. Otitis media (acute): antimicrobial prescribing. 2017. www.nice.org.uk/guidance/indevelopment/gid-apg10001.
4. DE Tunkel M, Rosenfeld, Xavier D, Sevilla, Richard H, Schwartz, Pauline A, Thomas and David Alejandro Hoberman, Mary Anne Jackson, Mark D. Joffe, Donald T. Miller, Richard Allan S. Lieberthal, Aaron E. Carroll, Tasnee Chonmaitree, Theodore G. Ganiats, Clinical practice guidelines: The diagnosis and management of Acute otitis media; from the American academy of Paediatrics. www.pediatrics.org/cgi/doi/10.1542/peds.2012-3488 . 2013;131:e964Pediatrics
5. Clinical practice guideline: Otitis Media with effusion (update). *Otolaryngology—Head and Neck Surgery* 2016, Vol. 154(1S) S1–S41 1 American Academy of Otolaryngology—Head and Neck Surgery Foundation 2016
6. E Rettig, D Tunkel. Contemporary concepts in management of acute otitis media in children. *Otolaryngol Clin N Am* 47 (2014) 651–6727.
7. Steele DW, Adam GP, Di M, et al. Effectiveness of Tympanostomy Tubes for Otitis Media: A Meta-analysis. *Pediatrics*. 2017;139(6):e20170125
8. Venekamp RP, Javed F, vanDongen TMA, Waddell A, Schilder AGM. Interventions for children with ear discharge occurring atleast two weeks following grommet (ventilation tube) insertion. *CochraneDatabaseof SystematicReviews* 2016, Issue 11. Art.No.: CD011684. DOI: 10.1002/14651858.CD011684.pub2.
9. Venekamp RP, Burton MJ, van Dongen TMA, van der Heijden GJ, vanZon A, Schilder AGM. Antibiotics for otitis media with effusion in children. *CochraneDatabaseof SystematicReviews* 2016, Issue 6. Art. No.: CD009163. DOI: 10.1002/14651858.CD009163.pub3.
10. Jeremy Chee a,* , Khang Wen Pang a, Jui May Yong b, Roger Chun-Man Ho c, Raymond Ng. Topical versus oral antibiotics, with or without corticosteroids, in the treatment of tympanostomy tube otorrhea. *J. Chee et al./International Journal of Pediatric Otorhinolaryngology* 86 (2016) 183-188.
11. Ranakusuma RW, Pitoyo Y, SafitriED, Thorning S, Beller EM, SastroasmoroS, Del Mar CB. Systemic corticosteroids for acute otitis media in children. *CochraneDatabaseof SystematicReviews* 2016, Issue 7. Art. No.: CD012289. DOI: 10.1002/14651858.CD012289.
12. eTG complete Therapeutic Guidelines Limited 2018, *Acute otitis media*, viewed 6 December 2018, < https://tgldcdp.tg.org.au/viewTopic?topicfile=ear-nose-throat-infections&guidelineName=Antibiotic#toc_d1e444>
13. The Royal Children's Hospital Melbourne, *Clinical Practice Guidelines:Acute otitis media*, viewed 6 December 2018, <<https://www.rch.org.au/search/?addsearch=acute%20otitis%20media>>
14. National Institute for Health and Care Excellence (NICE) 2018, *Otitis media (acute):antimicrobial prescribing*, viewed 6 December 2018, <<https://www.nice.org.uk/guidance/ng91>>

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Write Group Lead

Dr Sonja Latzel

Write Group Members

Dr David Wabnitz
Ms Silvia O'Connor

SA Paediatric Clinical Practice Guideline Reference Group Members

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Contact: Health.PaediatricClinicalGuidelines@sa.gov.au
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