

Acute Otitis Media – Pediatric Clinical Care Pathway (CCP)

- For Adult client see [Adult Acute Otitis Media CCP](#) (Ears, Nose, Throat and Mouth)

Purpose of this Document

- ❖ Outlines key elements of the clinical care process for acute otitis media in the Pediatric population
- ❖ Provides a *condition-specific* pathway of assessment and care for diagnosed or suspected acute otitis media. Refer to the **Introduction - General Assessment** ([Pediatric Ears, Nose, Throat and Mouth](#)), for complete general assessment
- ❖ Supports the assessment, Physician/Nurse Practitioner consultation, and documentation for the clinical encounter within the primary health care setting, in remote and isolated Indigenous communities

ASSESSMENT 1-21



Consult Physician/Nurse Practitioner promptly:

- For any infant < 6 months in whom AOM is suspected
- For severe presentation that may require medical evacuation
- For any febrile infant

- Refer to the **Introduction - General Assessment** ([Pediatric Ears, Nose, Throat and Mouth](#)), for complete general assessment



Red Flags

- ☐ Altered mental status
- ☐ Toxic appearance
- ☐ Pain and edema over mastoid bone
- ☐ Lethargy
- ☐ Uncontrolled fever
- ☐ Cranial nerve palsies
- ☐ Severe and/or persistent headache
- ☐ Vertigo
- ☐ Tinnitus
- ☐ Cholesteatoma
- ☐ Dehydration

Note: Complications of acute otitis media may include **meningitis** and **mastoiditis**. If these are suspected, consult the [Mastoiditis e-CCP](#) (Ears, Nose, Throat and Mouth) and/or [Meningitis CPG](#) (Pediatric - Communicable Diseases Chapter)

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Health History

General

- ☐ Fever
- ☐ Sleeplessness
- ☐ Irritability
- ☐ Crying
- ☐ Crying associated with sucking in infants and young children
- ☐ Recent or current upper respiratory tract infection (URTI)

Provide *trauma-informed care* and ensure an approach based on *cultural safety and humility*, at all stages of the nursing encounter.

Integumentary

- ☐ Rash

HEENT

- ☐ Otalgia
- ☐ Tugging at the ear
- ☐ Rubbing the head
- ☐ New onset otorrhea (often associated with sudden relief of otalgia)
- ☐ Hearing loss
- ☐ Vertigo

Gastrointestinal

- ☐ Poor feeding/anorexia
- ☐ Vomiting
- ☐ Diarrhea

Risk Factors

- ☐ Young age
- ☐ Recent or current URTI symptoms
- ☐ Eustachian tube dysfunction or obstruction
- ☐ Down's syndrome or any craniofacial anomalies (cleft palate and others)
- ☐ Indigenous children as a group due to health disparities associated with social determinants of health
- ☐ Some bottle-fed children (e.g., those who are propped up for feeding or go to sleep with a bottle at night)
- ☐ Children who use pacifiers
- ☐ Children who are not breastfed for at least 3 months
- ☐ Family history of acute otitis media

Social History

- ☐ Daycare attendance
- ☐ Exposure to tobacco smoke
- ☐ Low socioeconomic status
- ☐ Overcrowded living conditions



Record Allergies

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Physical Exam

General

- ☐ Fever

HEENT

If unable to visualize the tympanic membrane (TM):

- Wax and other debris should be removed from the ear canal to allow a clear view of the TM
- This procedure should be performed by a health care professional with adequate skills and knowledge
- Gently remove cerumen when possible, avoiding trauma to the ear canal and tympanic membrane, using a curette
- ☐ Bulging of the TM
- ☐ Opacification of the TM – can be recognized by:
 - TM cloudy, yellowish or opaque
 - Bony landmarks obscured or absent
 - Air fluid level
 - Bubbles
- ☐ Erythema of the TM (not always associated with infection, may be due to coughing, crying, etc.)
- ☐ Possible perforation of the TM
- ☐ Purulent otorrhea in the auditory canal
- ☐ Decreased mobility of the TM (as observed with pneumatic otoscope if available)
- ☐ Peri-auricular and anterior cervical lymphadenopathy
- ☐ Presence of conjunctivitis

Image 1: Erythema and superior opacification of the tympanic membrane



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Image 2: Bulging of the tympanic membrane with opacification; bony landmarks are absent



Ensure vital signs are recorded and within normal values

Normal pediatric values

Age	Heart rate (beats/min)	Blood pressure (mmHg)	Respiratory rate (breaths/min)	Oxygen saturation	Temperature
Neonate 0-1 month	90-190	SBP 67-84 DBP 35-53	30-60	All Ages	All Ages
Infant 1-12 months	100-180	SBP 72-104 DBP 37-56	30-53	>94%	Rectal: 36.6°C-38°C Oral: 35.5°C-37.5°C Axillary: 36.5°C-37.5°C Tympanic: 35.8°C-38°C
Toddler 1-2 years	98-140	SBP 86-106 DBP 42-63	22-37		
Preschooler 3-5 years	80-120	SBP 89-112 DBP 46-72	20-28		
School-age 6-11 years	75-118	SBP 97-120 DBP 57-80	18-25		
Adolescent 12-19 years	60-100	SBP 110-131 DBP 64-83	12-20		

- Refer to the **Introduction - General Assessment** ([Pediatric Respiratory System](#)), for additional information on measurement of vital signs, if required



Clinical Pearls and Tools

- Accurate diagnosis requires otoscopy.
- Pneumatic otoscopy (if available) can provide additional diagnostic information

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Table 1: Criteria for Diagnosis of Acute Otitis Media (Pediatric)

ALL 3 of the following criteria must be present to diagnose AOM in a pediatric client:	
1) Acute onset of symptoms	
2) Middle ear effusion indicated by:	○ Bulging TM and/or ○ Loss of bony landmarks / erythematous or opaque TM /air-fluid level on TM and/or ○ TM mobility is limited or absent (confirmed with pneumatic otoscope (if available) and/or ○ Purulent otorrhea that is not associated with otitis externa
3) Signs of middle-ear inflammation	○ Marked intense erythema over bulging TM And/or ○ Otalgia

Table 2: Clinical Features of Different Types of Otitis

Clinical features	Acute Otitis Media (AOM)	Serous Otitis Media or Otitis Media with Effusion	Chronic Suppurative Otitis	Otitis Externa
Onset	☐ Sudden	☐ Chronic ☐ Often occurs after AOM	☐ Chronic > 2 weeks	☐ Variable
Fever	☐ Present	☐ None	☐ None	☐ None
Otalgia	☐ Yes if TM not perforated ☐ Sudden relief when TM perforation occurs	☐ None	☐ None	☐ Yes when manipulating pinna or when applying pressure on tragus
Tympanic Membrane	☐ Bulging ☐ Opacification ☐ Erythema ☐ May develop perforation ☐ Decreased mobility	☐ Visible air-fluid level behind the TM ☐ Bubbles behind TM ☐ Retraction ☐ Decreased mobility	☐ Perforation	☐ Usually intact unless perforated prior to otitis externa (secondary to trauma, infection, etc.)

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Table 2: Clinical Features of Different Types of Otitis

Clinical features	Acute Otitis Media (AOM)	Serous Otitis Media or Otitis Media with Effusion	Chronic Suppurative Otitis	Otitis Externa
Otorrhea	☐ New onset if TM perforation ☐ Purulent	☐ None	☐ Otorrhea > 2 weeks ☐ Purulent ☐ Intermittent or persistent	☐ Present (colour and texture vary) ☐ Can be associated with debris
Hearing Loss	☐ Yes	☐ Yes	☐ Yes	☐ Yes possible
Other Signs and Symptoms	☐ Increased fussiness (child) ☐ Aural fullness ☐ Vertigo	☐ Aural fullness ☐ “Popping” sounds in the ear ☐ Loss balance/clumsiness	☐ Recent URTI symptoms or AOM	☐ Ear canal swollen ☐ Pruritus

Differential Diagnoses

- [Otitis media with effusion](#) (serous otitis media)
- [Chronic suppurative otitis media](#)
- [Otitis externa](#)
- [Mastoiditis](#)
- [Common cold](#)
- [Ceruminosis](#)
- [Dental abscess](#) (referred ear pain)
- [Pharyngotonsillitis](#) ([Viral](#)) ([Bacterial](#))
- Eustachian tube disorders
- Bullous myringitis
- Trauma
- Foreign body – ear
- Temporomandibular joint dysfunction
- Lymphadenitis
- Parotitis
- Barotrauma
- Deep space head/neck infections

Refer to the **Introduction - General Assessment – Common Presentations** section ([Pediatric Ears, Nose, Throat and Mouth](#)), to review other potential differential diagnoses for common presentations.

Diagnostic Tests and Investigations

Diagnosis of acute otitis media is based on clinical presentation. Diagnostic tests are not generally indicated for this condition.

MANAGEMENT, INTERVENTIONS AND MONITORING 2, 11-13, 20-30

Goals of Management

- Client feels safe, listened to, and involved in management and care decisions
- Eliminate infection
- Resolve/reduce fever if present
- Relieve pain
- Maintain hydration
- Prevent complications
- Prevent recurrence
- Restore normal middle ear pressure
- Restore hearing
- Avoid antibiotic resistance

Considerations

- Use a client-centred, collaborative approach based on **respect, empathy, dignity, compassion, and shared-decision making**
- Consider the client's individual, community and cultural context in management decisions and care planning
- Discuss supports available to the client, and ensure the client and/or caregiver can manage the care plan after discharge
- Consider determinants of health such as access to basic amenities (clean, potable water), phone and means of transportation, and any other financial or environmental limitations that may affect the care plan

Non-Pharmacological Interventions

Client-Centred Learning

- Provide education and instructions to the client/caregiver
- Recommend increased rest and good hydration in the acute febrile phase
- Advise client/caregiver of appropriate use of medications to treat current condition
- Discuss with client/caregiver any concerns or limitations they may have in relation to the care plan and work to identify strategies to address them
- **Air Travel:** avoid flying while acute otitis media is present in order to prevent pain and/or barotrauma from occurring. If it is necessary to fly, chewing gum, breastfeeding or bottle feeding may be helpful to alleviate symptoms of pain
- If the TM is perforated, it is important to avoid submersion in water
- Antihistamines and decongestants have no proven efficacy in the treatment of acute otitis media and should be avoided
- Provide client/caregiver with clear education on the course and expected outcomes of the illness
- Advise client/caregiver to follow up immediately if symptoms worsen, or if new symptoms such as rash, sleepiness, dyspnea, or vomiting occur

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Prevention Strategies

- Smoke-free environment
- If appropriate, discuss breastfeeding and its protective effects / decreased likelihood of otitis media
- Nasal hygiene according to child's age
- Discuss risks associated with pacifier use and bottle propping
- Ensure immunizations are up to date

Pharmacological Interventions



Review and document current medications, including over-the-counter, complementary, alternative, and traditional Indigenous medicines, as well as chemical or substance intake which may impact management, prior to initiating treatment.

Review the drug monograph, the FNIHB Nursing Station Formulary and/or provincial/territorial formulary prior to initiating treatment.



Consult Physician/Nurse Practitioner when practice is outside legislated scope and without authorized delegation

Antipyretics/Analgesics

Acetaminophen: Pediatric usual dosage [Oral]	
Acetaminophen 10 to 15 mg/kg/dose PO every 4 to 6 hours PRN	
	Maximum dose: From all sources Acetaminophen 75 mg/kg in 24 hours or 4000 mg in 24 hours, whichever is less. Do not exceed 5 doses per day. Caution: hepatic, INR, renal
Acetaminophen: Pediatric usual dosage [Rectal]	
Acetaminophen 10 to 20 mg/kg/dose PR every 4 to 6 hours PRN <i>Rectal administration results in erratic absorption and a much slower onset of action compared to oral administration.</i>	
	Maximum dose: From all sources Acetaminophen 75 mg/kg in 24 hours or 4000 mg in 24 hours, whichever is less. Do not exceed 5 doses per day. Caution: hepatic, INR, renal
Ibuprofen: Pediatric usual dosage	
Infant less than 6 months: Limited data available in infants. Consult with prescriber.	
For 6 months to 12 years of age: Ibuprofen 5 to 10 mg/kg/dose PO every 6 to 8 hours PRN	

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	Maximum dose: From all sources Ibuprofen 400 mg per dose. Daily maximum of ibuprofen is 40mg/kg in 24 hours. Caution: cardiac, hepatic, INR, pregnancy, renal
For Greater than 12 years of age: Ibuprofen 200 to 400 mg PO every 4 to 6 hours PRN	
	Maximum dose: From all sources Ibuprofen 40 mg/kg in 24 hours or 1200 mg in 24 hours, whichever is less. Under physician/nurse practitioner supervision, daily doses up to 2400 mg may be used. Caution: cardiac, hepatic, INR, pregnancy, renal

Note: ASA should not be used in children, teenagers or young adults with a viral infection such as chickenpox, a cold, influenza or flu-like illness due to the association with Reye's syndrome.

Fluid Management

- For pediatric dehydration management refer to the [Fluid Management for Dehydration CCP \(Pediatric\)](#)

Antibiotic Therapy



Review antibiotics prescribed for any type of infection in the previous three months and determine whether there has been significant exposure to a particular antibiotic class.

Considerations prior to initiating antibiotics in client 6 months of age or older who meets [criteria for AOM diagnosis \(see Table 1\)](#)

1. Consider watchful waiting

- In many cases, an AOM may resolve within 24 hours without antibiotic treatment.
- HOWEVER – a watchful waiting period of 24 to 48 hours could be considered **ONLY IF ALL of the following criteria are met:**
 - Less than 48 hours since onset of symptoms
 - Illness is mild and uncomplicated (child is alert, responsive, responds to antipyretics, mild otalgia, able to sleep)
 - Temperature less than 39°C without antipyretics
 - Absence of TM perforation and purulent discharge
 - No risk of complications associated with immunosuppression, chronic cardiac or pulmonary conditions, head or neck abnormalities, etc.

AND

- Must be a shared decision with parents/caregiver
- Ability to follow up with client within the next 24 to 48 hours
- Ability of parents and caregivers to return easily to clinic if symptoms worsen or persist

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2. Antibiotics at initial visit

Children with **ANY** of the following criteria should be treated with antibiotics:

- Acute / new onset TM perforation with purulent discharge
- Moderate or severe illness (e.g. severe otalgia, poor feeding, irritability, unable to sleep, etc.)
- More than 48 hours since the onset of symptoms
- Temperature greater than or equal to 39°C without antipyretics
- Risk of complications associated with immunosuppression, chronic cardiac or pulmonary conditions, head or neck abnormalities, etc.
- Inability to follow up with client within the next 24 to 48 hours

If antibiotic therapy is indicated at initial visit: Choice and duration of the antibiotic may vary depending on whether conjunctivitis is present, or whether there has been previous treatment failure.

Targeted Population	Medication
AOM with or without acute perforation	Amoxicillin 90 mg/kg/day PO divided BID Maximum dose: 2000 mg per dose Duration of therapy: Children 6 months to less than 2 years of age: 10 days Children 2 years of age and older: ○ With mild symptoms: 5 to 7 days ○ Acute perforation of TM or severe symptoms: 10 days  Caution: renal
Recurrent AOM (AOM in past 30 days) AND/OR Purulent conjunctivitis associated with AOM AND/OR Failure of treatment with single ingredient amoxicillin after 48 to 72 hours	Amoxicillin/Clavulanate 90 mg/kg/day of amoxicillin PO divided BID for 10 days Maximum dose: 1500 mg amoxicillin per dose  Caution: hepatic, INR, renal

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AND/OR Previous history of AOM unresponsive with single ingredient amoxicillin	
If severe vomiting or child cannot tolerate PO antibiotics AND/OR Failure of treatment with amoxicillin/clavulanate after 48 to 72 hours	CefTRIAXone 50mg/kg/day IM or IV every 24 hours for 3 days Maximum dose: 1000 mg per dose  Caution: INR
Suspected penicillin allergy (non-life-threatening reaction)	Cefuroxime axetil 30mg/kg/day PO divided BID Maximum dose: 500mg per dose Duration of therapy: Children 6 months to less than 2 years of age: 10 days Children 2 years of age and older: ○ With mild symptoms: 5 to 7 days ○ Acute perforation of TM or severe symptoms: 10 days  Caution: INR, renal
Documented anaphylactic type penicillin allergy	Azithromycin 10 mg/kg/day PO once daily for 3 days Maximum dose: 500 mg per dose  Caution: cardiac, INR

Note: Management of AOM in a client with a history of chronic perforated tympanic membrane or with ventilation tubes may include topical drops with or without oral antibiotics, depending on the clinical presentation and severity of the illness.

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Immunizations

- Ensure immunizations are up to date
- Pneumococcal conjugate (Pneu-C-13)
- Annual influenza vaccine
- COVID-19 vaccine

Monitoring

- Monitor cardiorespiratory status and vital signs as indicated by the client's condition
- Monitor for signs of complications
- Before considering discharge home, ensure that client does not have:
 - Meningeal symptoms
 - Cranial nerve palsies
 - Signs of mastoiditis
 - Uncontrolled fever

DISCHARGE AND FOLLOW-UP PLAN [11](#), [22](#), [31](#)

- Before discharge home, ensure that the client/caregiver:
 - Understands instructions provided (interpreter may be needed in case of language differences)
 - Understands and is able to recognize the clinical signs of potential complications of AOM such as mastoiditis or meningitis
 - Is able to provide/take the medication as prescribed
 - Understands and is aware of when to return for re-evaluation
 - Has no concerns or limitations that may prevent their return for re-evaluation if required
- Follow-up should take place at any time if the client is not improving or their condition deteriorates, or if [red flag symptoms](#) develop
 - 24-48 hours after initial visit, follow up with the client/caregiver by telephone or schedule a follow-up visit as necessary, reassess antibiotic therapy needs
 - In case of treatment failure after 48-72 hours, consult the Physician/Nurse Practitioner and consider treatment with a second-line antibiotic

- **Follow-up monitoring:**

Perforated tympanic membrane

- If not resolved within 6 weeks of rupture, refer to otolaryngology

Persistent middle ear effusion

- Middle ear effusion may persist after treatment; if the child is asymptomatic there is no need to treat
- If effusion persists for longer than 3 months, consider audiology referral
- Refer to the [Pediatric Otitis Media with Effusion \(Serous Otitis Media\) CCP](#)

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Frequent AOM

- Document and review the frequency of AOM
- Recurrent episodes of AOM (≥ 4 distinct and documented episodes in 6 months or ≥ 4 distinct and documented episodes in 12 months) requires consultation with otolaryngology and audiology to evaluate for hearing loss
- Antibiotic prophylaxis may be considered for recurrent AOM – but requires consultation with Physician/Nurse Practitioner



Record discharge plan and date of follow-up

Referral and/or Consultation

- Coordinate referral request(s) as required (e.g., otolaryngology; audiology)
- Arrange for medical evacuation if indicated
- Emergency travel outside of the community can be stressful for clients and their families: provide open and clear information on the reasons for the transfer, what is needed and what may be expected

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