

ENT • PEDIATRIC • INFECTION

Otitis Media & Otitis Externa

Acute & Chronic Middle Ear Infection · Swimmer's Ear · Nursing Care, Complications & Patient Teaching

ENT / SENSORY

PEDIATRIC HIGH-YIELD

INFECTION CONTROL

PHARM: ANTIBIOTICS

NGN NCLEX 2026



SOURCE TRANSPARENCY

This topic was **not present** in the uploaded reference notes for this study set. Content was compiled from standard NGN NCLEX 2026 references: *Saunders Comprehensive Review for the NCLEX-RN Examination* (8th ed.), *ATI RN Adult Medical-Surgical Nursing* and *ATI Nursing Care of Children*, *Lippincott Illustrated Reviews*, the *AAP 2013 Clinical Practice Guideline on AOM* (reaffirmed), and the *2014 AAO-HNS Clinical Practice Guideline on Acute Otitis Externa*.

Definition & Overview

THREE DISTINCT EAR INFECTIONS – KNOW THE LOCATION

AOM

Acute Otitis Media

Middle ear infection (behind the tympanic membrane). Rapid onset of inflammation with fluid in the middle ear space. **#1 reason for antibiotic prescriptions in children** — peaks at 6–24 months.

COM

Chronic Otitis Media

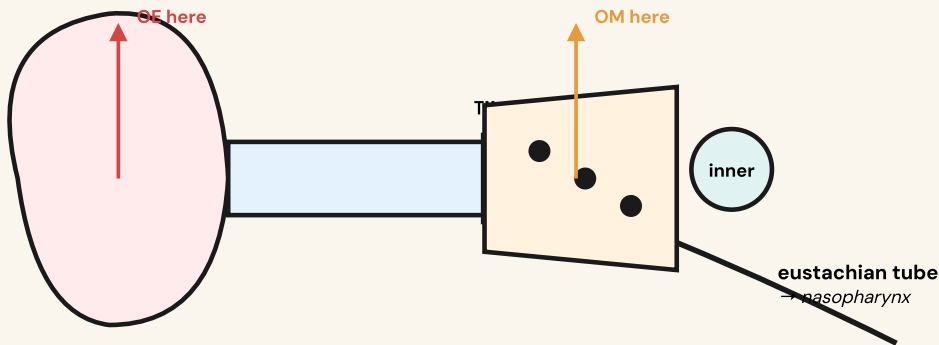
Middle ear infection that is recurrent (≥ 3 episodes in 6 mo) or persistent with a perforated tympanic membrane and chronic drainage (otorrhea) lasting > 6 weeks. May lead to **cholesteatoma**.

OE

Otitis Externa

External ear canal infection (a.k.a. "swimmer's ear"). Inflammation between the pinna and tympanic membrane. **Tragus pain** is the giveaway. Common in summer/swimmers.

EAR ANATOMY – WHERE EACH INFECTION LIVES



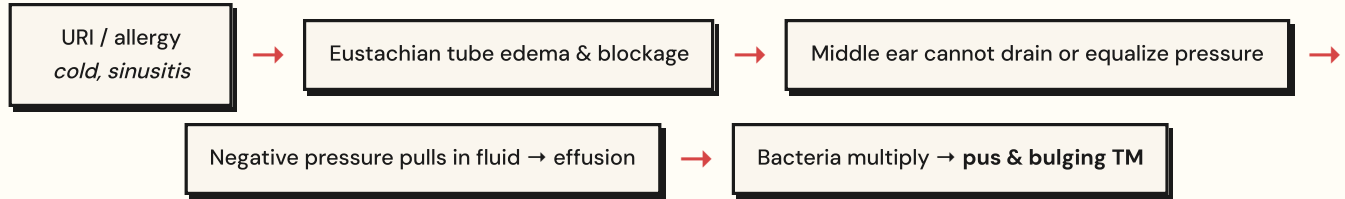
- **Otitis Externa**
outer canal
- **Otitis Media** (
middle ear, behind
- **Inner ear**
balance & hearing

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Pathophysiology

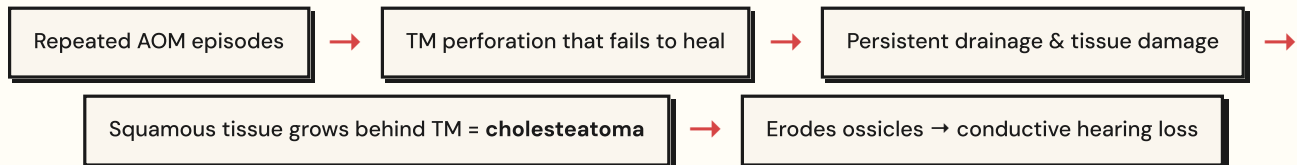
WHY THIS HAPPENS — MECHANISM IN PLAIN ENGLISH

► ACUTE OTITIS MEDIA (AOM)

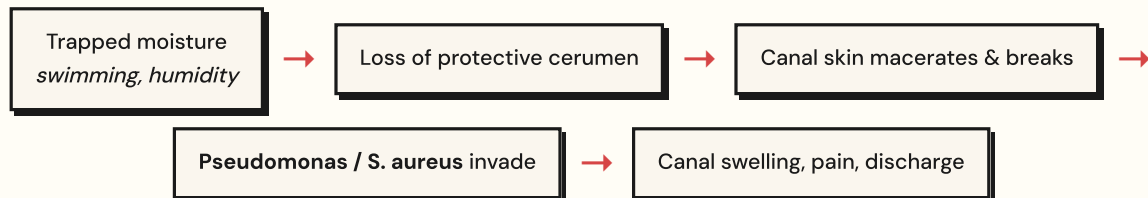


Why children? The pediatric eustachian tube is **shorter, wider, and more horizontal** than the adult tube, allowing nasopharyngeal pathogens to ascend more easily. The tube becomes more vertical and adult-like around age 6–7.

► CHRONIC OTITIS MEDIA (COM)



► OTITIS EXTERNA (OE)



Common pathogens — AOM: Streptococcus pneumoniae, non-typeable H. influenzae, Moraxella catarrhalis. OE: **Pseudomonas aeruginosa** (most common) and Staphylococcus aureus.

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Signs & Symptoms

CUE RECOGNITION – WHAT EACH INFECTION LOOKS LIKE

► ACUTE OTITIS MEDIA

Early / Classic

- **Otalgia** (ear pain) — sudden onset
- Fever (often > 102°F / 39°C)
- **Pulling/tugging at ear** in infants 🚩
- Irritability, crying, poor feeding
- Disrupted sleep
- Loss of appetite

Otoscope Findings

- **Red, bulging TM** — hallmark finding
- Loss of normal landmarks/light reflex
- **Decreased TM mobility** on pneumatic otoscopy
- Purulent effusion behind TM
- If perforated: pus drainage + sudden pain relief

🚩 RED FLAGS — REPORT IMMEDIATELY

- **Postauricular swelling, redness, or tenderness** → mastoiditis
- **Stiff neck, severe headache, altered LOC, photophobia** → meningitis
- **Facial droop / facial nerve palsy** → CN VII involvement
- **Vertigo, nystagmus, sensorineural hearing loss** → labyrinthitis / inner ear extension

► CHRONIC OTITIS MEDIA

Hallmarks

- **Persistent purulent otorrhea** (drainage)
- **TM perforation** on exam
- **Conductive hearing loss**
- Often *painless* (vs. acute)
- Foul-smelling drainage if cholesteatoma

Cholesteatoma Cues

- White, pearly mass behind TM
- Progressive hearing loss
- Dizziness / vertigo
- Facial weakness (late)
- Persistent foul-smelling drainage despite antibiotics

► OTITIS EXTERNA

Classic Findings

- **Pain on tragus manipulation** 🚩 (signature finding)
- Pain with chewing or pulling pinna
- Itching in ear canal (often early)
- Watery → purulent discharge
- Swollen, erythematous canal
- Feeling of fullness/blockage
- Conductive hearing loss if canal occluded

What you do NOT see in OE

- **TM is normal** (key distinguisher from OM)
- No bulging or fluid behind drum
- Systemic fever uncommon unless severe
- If high fever, severe pain, facial nerve signs in diabetic or immunocompromised → suspect **malignant (necrotizing) otitis externa** 🚩

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Priority Nursing Interventions

ABC + SAFETY FRAMEWORK – NCLEX PRIORITIZATION

A

AIRWAY / ASSESS

- Assess pain (FLACC for infants, FACES for children, 0–10 for adults)
- Inspect ear with otoscope: TM color, contour, mobility, drainage
- Check hearing — whisper test, audiometry if chronic
- Assess for red flags: postauricular swelling, neck stiffness, facial weakness

B

BREATHING / BASELINE VITALS

- Monitor temperature q4h — fever spike may signal worsening/complication
- Assess for URI symptoms (since AOM often follows a cold)
- Auscultate breath sounds — children with AOM frequently have concurrent respiratory illness

C

COMFORT / CIRCULATION

- **Administer analgesics:** acetaminophen or ibuprofen for pain & fever (avoid aspirin in children — Reye's)
- **Warm compress** to the affected ear (or cool compress for OE swelling)
- Position with **affected ear down** after tympanostomy or if drainage present — promotes drainage
- For OE: **ear wick** may be inserted to deliver drops if canal is swollen shut

S

SAFETY / SPECIFIC INTERVENTIONS

- **Administer otic drops correctly:** warm to body temp (cold drops cause vertigo & nausea — see *Eye Drugs #2* rule), pull pinna **UP & BACK** for adults/children >3, **DOWN & BACK** for children <3
- Have client lie on side with affected ear up for 5 minutes after drops
- After tympanostomy tube placement: **keep ears dry** — earplugs for bathing/swimming
- Encourage fluids (especially if febrile) and rest
- Monitor for hearing changes — speech delay risk in chronic pediatric OM

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Pharmacology

FIRST-LINE THERAPIES + KEY NURSING CONSIDERATIONS

DRUG / CLASS	USE	MECHANISM / ACTION	SIDE EFFECTS & NURSING CONSIDERATIONS
Amoxicillin <i>Penicillin</i>	AOM first-line High dose: 80–90 mg/kg/day ÷ BID × 10 days	Inhibits bacterial cell wall synthesis; covers <i>S. pneumoniae</i>	Assess for penicillin allergy. Rash, diarrhea, <i>C. difficile</i> risk. Complete full course even if symptoms resolve.
Amoxicillin-Clavulanate (Augmentin)	AOM 2nd-line or if treatment failure in 48–72 hrs	Adds beta-lactamase inhibitor; covers <i>H. influenzae</i> & <i>M. catarrhalis</i>	High rate of diarrhea — give with food. Monitor for rash, <i>C. difficile</i> .
Ceftriaxone <i>3rd-gen cephalosporin</i>	Severe AOM, vomiting, or treatment failure	IM injection; broad-spectrum cell wall inhibitor	Cross-sensitivity in ~1–2% of PCN-allergic patients. Painful IM — rotate sites.
Azithromycin / Cefdinir	True PCN allergy	Macrolide or cephalosporin alternative	Azithromycin: QT prolongation risk; GI upset. Cefdinir: red stools possible (harmless).
Ofloxacin / Ciprofloxacin (otic)	OE first-line ; also for OM with tympanostomy tubes or perforation	Fluoroquinolone — bactericidal; safe with perforated TM	Warm drops to body temp. Insert ear wick if canal swollen. 7–10 day course.
Neomycin / Polymyxin B / Hydrocortisone (Cortisporin Otic)	OE with intact TM only	Combination antibiotic + steroid drops	⚠️ Contraindicated with perforated TM — neomycin is ototoxic. Steroid reduces canal swelling.
Acetaminophen / Ibuprofen	Pain & fever — all three conditions	Antipyretic + analgesic	Weight-based pediatric dosing. No aspirin in children (Reye's syndrome). Ibuprofen not for infants < 6 mo.
Benzocaine otic (Auralgan – historical)	Topical pain relief	Local anesthetic	Do NOT use if TM is perforated. Use is now limited due to methemoglobinemia risk in infants.

"Watchful waiting" — AAP guideline: For children ≥ 6 months with non-severe unilateral AOM and no otorrhea, observation for 48–72 hours with analgesics alone is acceptable — antibiotics are started only if symptoms worsen or fail to improve. Always treat children < 6 months and severe cases with antibiotics immediately.

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NCLEX Test Traps ⚠

COMMON MISTAKES & PRIORITY VS NON-PRIORITY

✗ WRONG

"Pull the pinna up and back" for a 2-year-old with AOM.

✓ RIGHT

For children **under 3**, pull pinna **DOWN and BACK**. Up and back is for adults and children > 3.

✗ WRONG

Reporting "sudden pain relief with drainage" as a worsening sign.

✓ RIGHT

Sudden pain relief with new otorrhea usually means the **TM has ruptured** and pressure is released. Still notify provider, but the child is often *more* comfortable.

✗ WRONG

Instilling cold drops from the refrigerator straight into the ear.

✓ RIGHT

Always warm drops to body temperature — cold drops trigger **vertigo, nausea, and pain**. (Same rule as *Eye Drugs #2*.)

✗ WRONG

Using Cortisporin (neomycin) drops when the child has tympanostomy tubes or a perforated TM.

✓ RIGHT

Neomycin is **ototoxic**. Use a **fluoroquinolone** (ofloxacin or ciprofloxacin) drop when the middle ear is exposed.

✗ WRONG

Confusing tragus pain with TMJ pain or jaw pain.

✓ RIGHT

Pain when pressing on the tragus = otitis externa until proven otherwise. This single finding distinguishes OE from OM on the exam.

✗ WRONG

"Stop the antibiotic — my child feels better after 4 days."

✓ RIGHT

Complete the **full 10-day course**. Stopping early causes recurrence and resistance — a top patient-teaching item on NGN.

✗ WRONG

Allowing a child with new tympanostomy tubes to swim without earplugs.

✓ RIGHT

Keep ears **dry**: earplugs for bathing/swimming until provider clears. Diving and head submersion are highest risk for water entry.

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Complications

WHAT YOU MUST NOT MISS

Mastoiditis

- Infection of mastoid bone behind ear
- Postauricular pain, swelling, redness
- Ear pushed forward/outward
- Requires IV antibiotics ± mastoidectomy

Meningitis

- Spread to CNS via temporal bone
- Stiff neck, severe HA, photophobia, altered LOC
- Medical emergency

TM Perforation

- Sudden pain relief + otorrhea
- Most heal spontaneously in 2 weeks
- Keep ear dry while healing

Cholesteatoma

- Squamous cyst behind TM in chronic OM
- Erodes ossicles → hearing loss
- Foul-smelling drainage
- Requires surgical removal

Hearing Loss

- Conductive (most common) — fluid/scarring
- Risk of speech & language delay in young children
- Audiology referral for chronic cases

Malignant Otitis Externa

- Necrotizing infection — diabetics, elderly, immunocompromised
- Pseudomonas spreads to skull base
- Cranial nerve palsies (esp. CN VII)
- IV antibiotics, often hospitalized

Patient & Family Education

WHAT TO TEACH BEFORE DISCHARGE

For AOM (Pediatric)

- **Complete the full antibiotic course** even if better
- Give pain/fever meds on schedule first 24–48 hrs
- Apply warm compress to outer ear
- Avoid bottle-feeding while lying flat (milk pools in eustachian tube)
- **Eliminate secondhand smoke exposure**
- Promote breastfeeding ≥ 6 months — protective effect
- Keep up with pneumococcal & influenza vaccines
- Return if fever $\geq 102^{\circ}\text{F}$ after 48 hrs of antibiotics, neck stiffness, ear pushed forward, or facial weakness

For Otitis Externa

- **Keep ears DRY** — no swimming until cleared
- Earplugs / shower cap while bathing
- Tilt head and gently dry outer ear after water exposure
- **Never insert cotton swabs, hairpins, or fingers** into the canal — removes protective cerumen and traumatizes skin
- Use prescribed drops for full course — typically 7–10 days
- Prevention: a few drops of **rubbing alcohol or 50/50 alcohol-vinegar** after swimming dries the canal (if TM intact)

For Tympanostomy Tubes

- Tubes typically fall out spontaneously in 6–18 months
- Keep ears dry — **custom earplugs for bathing & swimming**
- No diving or head submersion until cleared
- Report new drainage, fever, or pain
- Hearing should improve within days
- Tubes may dislodge early — call provider if seen on pillow

Ear Drop Technique

- Warm bottle in hands for 1–2 minutes (never microwave)
- Wash hands; lie on side, affected ear up
- **Adult / child > 3:** pull pinna UP & BACK
- **Child < 3:** pull pinna DOWN & BACK
- Instill prescribed number of drops
- Gently press tragus to push drops in
- Remain side-lying for 5 minutes
- Do NOT plug canal with cotton unless instructed

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Memory Boosters & Mnemonics

PATTERN RECOGNITION & QUICK ASSOCIATIONS

★ MNEMONIC: "EARS" — ASSESSMENT IN OM

- E** **Erythema** & bulging of TM
- A** **Aching** ear / pulling at ear in infants
- R** **Reduced** mobility on pneumatic otoscopy
- S** **Systemic** signs — fever, irritability, anorexia

★ MNEMONIC: "SWIM" — OTITIS EXTERNA

- S** **Swelling** & pain of canal
- W** **Water** exposure (history) — "swimmer's ear"
- I** **Itching** + discharge
- M** **Manipulation** of tragus causes pain

★ PEDIATRIC PINNA PULL — "U-AB / D-AB"

Adults & kids > 3: U-AB = Up & Back

Kids < 3: D-AB = Down & Back

Remember: "Down for the little ones" — their canal is straight and angled downward; adult anatomy curves up.

★ PATTERN RECOGNITION — WHICH IS WHICH?

- **Bulging red TM + fever in a 2-year-old** → Acute Otitis Media
- **Perforated TM + chronic drainage** → Chronic Otitis Media
- **Pain on tragus push + swim history** → Otitis Externa
- **Postauricular swelling + ear pushed forward** → Mastoiditis
- **White pearly mass behind TM** → Cholesteatoma
- **Diabetic + severe OE + facial droop** → Malignant otitis externa

★ AMOXICILLIN — FIRST-LINE FOR AOM

"A-MOX-icillin for the MIDDLE-MOST infection"

Think: *Middle* ear = Amoxicillin (the *middle* of the alphabet starts with A → first-line).

If treatment fails in 48–72 hrs → step up to Augmentin (clavulanate).

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NCJMM Clinical Judgment Scenario

NEXT GEN NCLEX — 6 STEP CLINICAL JUDGMENT MODEL

SCENARIO: A nurse in a pediatric clinic is caring for a **22-month-old boy** brought in by his mother. The mother reports the child has been "pulling at his right ear" for two days, has not been sleeping well, and ate poorly today. The child had a runny nose and cough last week. **Vital signs:** T 102.4°F (39.1°C), HR 138, RR 32, SpO₂ 98% on RA. On examination, the right TM is **erythematous, bulging, and has decreased mobility**. The left TM is pearly gray and mobile. No postauricular swelling. Lungs clear. Neck supple. The mother states she gave him "an old amoxicillin from his cousin yesterday." She also mentions her partner smokes in the home.

STEP 1 — Recognize Cues

The nurse identifies the most relevant clinical findings from the scenario.

1

Relevant cues: Age 22 months (high-risk window), ear-pulling, fever 102.4°F, poor sleep and feeding, recent URI, **erythematous bulging right TM with decreased mobility** (diagnostic triad for AOM). Concerning context: **shared/old antibiotic use**, secondhand smoke exposure.

STEP 2 — Analyze Cues

The nurse interprets findings and links them to a clinical picture.

2

Findings are consistent with **acute otitis media (right ear)** following a viral URI. The eustachian tube was likely blocked from the cold, leading to middle ear effusion and bacterial infection. The child is in the highest-risk age group. **No red flags** for mastoiditis or meningitis are present (no postauricular swelling, neck supple, normal LOC).

STEP 3 — Prioritize Hypotheses

The nurse rank-orders likely diagnoses and concerns.

3

1st priority: Acute otitis media — needs treatment to prevent perforation, mastoiditis, hearing loss.
2nd priority: Safety — improper home antibiotic dosing (subtherapeutic exposure breeds resistance).
3rd priority: Modifiable risk — secondhand smoke as a recurrence driver.

STEP 4 — Generate Solutions

The nurse identifies expected nursing actions.

4

- Notify provider — anticipate high-dose **amoxicillin 80–90 mg/kg/day ÷ BID × 10 days**.
- Administer weight-based **acetaminophen or ibuprofen** for pain/fever.
- Apply warm compress to the right ear.
- Teach mother: **complete full course**, do not share antibiotics, do not stop early.
- Counsel on **smoke-free environment**, no bottle propping, encourage continued breastfeeding/upright feeding, ensure pneumococcal & flu vaccines are current.
- Schedule follow-up in 2–3 weeks to assess for resolution and middle ear effusion.

STEP 5 — Take Action

The nurse implements priority interventions during the visit.

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- Administer first dose of acetaminophen 15 mg/kg PO now for comfort and to bring down fever.
- Obtain accurate weight; reconcile with provider's antibiotic order before dispensing.
- Demonstrate the "**DOWN and BACK**" technique for any otic drops (since child is < 3).
- Review the printed home-care sheet line by line with the mother; teach-back required for medication schedule.
- Discard the leftover antibiotic from the cousin safely.
- Provide smoking cessation resources and discuss household exposure.

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STEP 6 — Evaluate Outcomes

The nurse determines whether the interventions achieved the desired outcomes.

Expected within 48–72 hours: fever resolves, pain decreases, child returns to normal feeding and sleep.

Expected within 10 days: antibiotic course completed without recurrence.

Expected at 2–3 week recheck: TM appears normal, mobility restored, no effusion, hearing intact.

Red flags requiring return to clinic: fever persists or worsens after 48–72 hrs of antibiotic, postauricular swelling/redness, neck stiffness, facial droop, vomiting, or decreased responsiveness → indicates mastoiditis, meningitis, or treatment failure.