PVM10CHEATSHEET

Otitis Media and Vestibular Dysfunction

Inner Ear Effects of Middle Ear Disease in Children

WHY THIS MATTERS

Otitis media is the most common childhood infection and a frequent but underrecognised cause of vestibular dysfunction. Both AOM and chronic OME impair balance. Cholesteatoma is the most dangerous form, capable of causing labyrinthine fistula, meningitis, and permanent vestibulocochlear damage. Facial palsy in any context of OM is cholesteatoma until proven otherwise — this must be acted upon immediately.

SPECTRUM — VESTIBULAR IMPACT BY OM TYPE

Type	Mechanism	Clinical feature	Urgency
AOM — uncomplicated	Endotoxin + cytokine diffusion through round window membrane	Transient dizziness during and after AOM; self-limiting	Routine
OME (glue ear)	Conductive loss; pressure effects on RWM; altered vestibulo-proprioceptive integration	Persistent disequilibrium; poor balance; delayed motor milestones	Routine — ENT if >3 months
AOM with suppurative labyrinthitis	Bacterial invasion of perilymph — EMERGENCY	Acute vertigo + severe SNHL + fever + vomiting	EMERGENCY — IV antibiotics + ENT
Coalescent mastoiditis	Bony destruction; labyrinthine fistula risk; facial nerve involvement	Postauricular swelling + severe pain + high fever + dizziness	EMERGENCY — hospital admission
Cholesteatoma	Erosion of lateral SCC wall — fistula; incus/stapes destruction; facial nerve	Chronic discharge + conductive loss + vertigo + Hennebert sign	URGENT ENT — surgery required

CHOLESTEATOMA — CRITICAL RECOGNITION

Feature	Detail
Definition	Keratinising squamous epithelium in middle ear — locally destructive and progressive
Key symptom	Painless, persistent, foul-smelling otorrhoea + conductive hearing loss — often minimal pain
Vestibular symptom	Dizziness + Hennebert sign (pressure-induced vertigo/nystagmus) = labyrinthine fistula
Facial nerve	Facial palsy in ANY OM context = cholesteatoma until proven otherwise — CT + urgent ENT same day
Hennebert sign	Pneumatic otoscopy — gentle pressure on TM induces vertigo and nystagmus; positive = fistula
HRCT temporal bones	Confirms bony erosion; canal wall status; intracranial extension
Management	Tympanomastoidectomy — always surgical; no conservative management for fistula
Sequelae of delay	Permanent SNHL; facial paralysis; meningitis; intracranial abscess

BALANCE ASSESSMENT IN OME

Test	Finding in OME	Interpretation
Tandem stance / Romberg	Increased sway; worse eyes closed	Vestibular contribution to balance reduced
MABC-2 balance subscale	Below age norms	Functional impact; physiotherapy referral
PTA + tympanometry	Type B curve; conductive loss 20–40 dBHL	Confirms fluid; quantifies hearing impact
vHIT + VEMP	Usually normal; reduced VEMP amplitude possible	Saccular impact from middle ear pressure
School performance	Reading difficulties; classroom listening problems	Correlate with audiogram; early intervention

SUPPURATIVE LABYRINTHITIS — EMERGENCY MANAGEMENT

Step	Action	Detail
1 — Diagnosis	Clinical + audiometry + HRCT	Acute vertigo + SNHL + fever in AOM context; exclude central mimics
2 — IV antibiotics	Ceftriaxone 50–100 mg/kg/day	Penetrates blood-labyrinth barrier; covers S. pneumoniae, H. influenzae
3 — Corticosteroids	Dexamethasone 0.15 mg/kg 6-hourly × 4 days	Reduce inflammation; may preserve cochlear function
4 — ENT consultation	Myringotomy + ventilation tube	Source control; drain middle ear; culture-directed therapy
5 — Exclude meningitis	LP after MRI if meningismus	Labyrinthitis can propagate intracranially via round window
6 — Audiology follow-up	PTA at 6 weeks + 6 months	Permanent SNHL in 30–50% of suppurative labyrinthitis

OME MANAGEMENT — GP ROLE

Intervention	Indication	Notes
Watchful waiting	OME <3 months; mild hearing loss <30 dBHL	80% resolve in 3 months; monthly review
Ventilation tubes (grommets)	OME >3 months + conductive loss >25 dBHL	Improves hearing promptly; removes middle ear pressure
Speech and language therapy	Language delay + OME	Refer early; do not wait for grommet decision
Balance physiotherapy	Confirmed vestibular impairment; MABC-2 below norm	Independent treatment pathway alongside audiology
ENT referral	Cholesteatoma; mastoiditis; suppurative labyrinthitis; OME >12 months	All complicated cases urgently

LONG-TERM BALANCE SEQUELAE

- Children with recurrent AOM have measurably worse balance performance than controls, even between acute episodes.
- OME causes a functional vestibulopathy via round window pressure effects — balance difficulties can persist after fluid resolves.
- Post-AOM BPPV occurs in children — assess with Dix-Hallpike at follow-up if rotatory vertigo persists.
- Post-suppurative labyrinthitis: residual SNHL, canal paresis, and BPPV all require specific management — reassess at 6 weeks.
- Any child with >3 episodes of AOM per year and persistent balance difficulties: vestibular physician referral concurrently with ENT.

LONG-TERM BALANCE CONSIDERATIONS

Aspect	Detail
Post-AOM vestibular sequelae	Balance difficulties can persist 3–6 months after OM resolution without specific VRT
MABC-2 monitoring	School-age children with recurrent OM: annual MABC-2 balance subscale; below 5th percentile = VRT referral
Post-labyrinthitis hearing outcome	Repeat audiogram at 6 weeks and 6 months; SNHL in 30–50%; ENT if severe loss
Post-labyrinthitis BPPV	Assess with Dix-Hallpike at 6-week follow-up; 10–15% develop post-labyrinthitis BPPV
Recurrent AOM	>3 episodes/year with persistent balance difficulties = concurrent ENT + vestibular physician referral
Cholesteatoma post-surgery	Vestibular function assessment post-tympanomastoidectomy; VRT if BVH or unilateral canal paresis

WHEN TO REFER

- **► Facial palsy + otorrhoea or ear pain — cholesteatoma; ENT same day; CT temporal bones immediately**
- **► Hennebert sign positive — labyrinthine fistula; ENT urgently; no further pneumatic manipulation**
- **► Acute vertigo + fever + significant SNHL — suppurative labyrinthitis; emergency admission + IV antibiotics**
- **► Postauricular swelling + ear pain + fever — coalescent mastoiditis; emergency admission + IV antibiotics**
- **► Persistent conductive loss >3 months — ENT for grommet decision; audiology + speech therapy**

♦ Facial palsy in the context of otitis media — even mild otitis media — is cholesteatoma until proven otherwise. Do not reassure and review. Order CT temporal bones and refer to ENT that day. Cholesteatoma erodes the bony canal of the facial nerve from within the middle ear space. Delayed treatment risks permanent facial paralysis and intracranial extension including abscess and meningitis.

♦ Glue ear does not just cause hearing loss — it causes a functional vestibulopathy. Children with chronic OME have measurably impaired postural stability and reduced VEMP amplitudes. These children fall more, have delayed gross motor milestones, and struggle with sports. Vestibular rehabilitation alongside audiological management gives better outcomes than treating the ear alone — this is underappreciated in standard OM guidelines.