

Screening

Every child should have age specific hearing questionnaire completed at 6 weeks, 6 months and then annually with parent/care give (page 4). In addition:

- At 6 weeks, 6 months, then annually from 1 - 3 years of age - check ear with otoscopy and perform pneumatic otoscopy (from 6 months).
- 4 - 10 years of age - annual check as above, PLUS perform screening audiometry.
- All children with delayed speech for age need hearing assessment AND paediatric referral (see page 2 'Development Assessment').
- Perform otoscopy on all children routinely at clinic.

Pneumatic otoscopy

"Pneumatic otoscopy" uses an otoscope with a rubber bulb attached to puff air into the ear canal. Looking with the otoscope can provide lots of information about the ear canal and the ear drum and some hints about the middle ear: The "pneumatic" puff is testing movement of the ear drum, which will give you extra information about what's going on in the middle ear:

- Make sure the ear canal is clear of wax and pus - you might need to dry mop or syringe the ear first.
- Check the otoscope has a strong light and ear tips that are the right size so you can produce a tight seal with the ear canal.
- Have a good look first with the otoscope.
- Gently squeeze the rubber bulb - as you push some air into the canal (positive pressure), the ear drum should move inwards (away from you), and as you release the bulb (negative pressure), the drum should return to its original position.

Normal mobility - Ear drum freely moves back and forth equally under positive and negative pressure. This means the eardrum is intact, or there is a plugged grommet if present, and that the air in the middle ear is at normal or near normal pressure. No treatment is required.

Reduced mobility - Little eardrum movement with positive and negative pressure. Typically means there is fluid and some air behind the eardrum. This condition should be reviewed if the ear is not infected.

Immobile - No movement of the eardrum with positive and negative pressure. If the eardrum is intact, there is fluid behind the eardrum (otitis media with effusion). Treat according to protocols.

Eardrums with perforations or functioning grommets - No eardrum movement will usually be seen either.

Case Definition

Acute otitis media +- perforation (AOM) - All forms of inflammation and infection of the middle ear of less than 2 weeks duration; usually with pain (though this may be absent), fever, red and bulging ear drum.

Recurrent otitis media (ROM) - 3 or more episodes of AOM in a 6 month period.

Chronic Suppurative Otitis Media (CSOM) - Middle ear infection with pus discharging and hole in the drum (which may be hard to see) for more than 2 weeks.

Dry perforation - Perforation for more than 2 weeks with no pus or fluid.

Otitis media with effusion (OME or glue ear) - Fluid present for more than 6 weeks behind ear drum (in the middle ear) with no sign of infection. Immobile drum on pneumatic otoscopy or type B Tympanogram.

Otitis Externa - Infection of the ear canal with intact drum.

Principles of Management

- Ear infections are common in the Kimberley and contribute to high rates of hearing loss and other long term complications.
- Ear infections should be treated aggressively, with the main goals of treatment being: to prevent prolonged hearing loss; prevent speech problems; and reduce risk of complications such as mastoiditis.
- Assistive hearing devices (hearing aids, classroom amplification devices) can make a significant difference to the person with hearing loss – primary health care staff have an important role in referring and advocating for clients to access these.
- A multidisciplinary team approach is essential for people with persistent hearing loss, including some or all of: parents/carer; clinic staff; GP; audiologist; teachers; allied health; ENT specialist; paediatrician.

Box 1: Instructions for dry mopping and syringing

Dry mopping - roll tissue to create tissue spear. Place gently in the ear. Leave in for about 20 seconds and rotate. Remove, and repeat until canal clear.

Syringing - use diluted Betadine (1:20) or sterile water. Fill a 50ml syringe, attach 1- 2cm of soft tubing to the end of the syringe (e.g. cut off butterfly giving set), and gently syringe ear, pointing towards top of the ear canal. Use container to catch water. **Gentle pressure is the key.**

Management

Watch for signs of mastoiditis (fever, swelling or tenderness behind the ear) and refer to doctor.

ACUTE OTITIS MEDIA +/- PERFORATION

- Amoxicillin** 25mg/kg/dose (max dose of 1 gram/dose) given twice a day for 7 days.
- Review at day 7 – if still discharging pus, increase dose of amoxicillin** to 45mg/kg/dose (max dose of 1 gram/dose) given twice a day for further 7 days.
- ** If allergic to penicillin use Cefaclor (10mg/kg/dose, three times a day) (max 500mg/dose).
- Keep ear canal clean – see Box 1, page 1.
- Review at day 14 – stop amoxicillin (or cefaclor); if pus still present, treat for CSOM.
- Give paracetamol 15mg/kg/dose (max 500mg/dose), no more than 4 times in 24 hours for pain relief if needed.

RECURRENT OM

- Long term antibiotics to prevent recurrent infections - Amoxicillin 15 mg/kg/dose (max 1 gram/dose) twice a day for 3 months.
- Review at least monthly while on antibiotics to check for "break through" infections.
- Perform screening audiometry and refer for formal Audiology assessment if abnormal.
- ENT referral if infections occur while taking antibiotics.

DRY PERFORATION

- Watch closely for 3 months.
- Advise parent / carer to bring child to clinic if any discharge / pus / ear pain.
- Keep ears dry. Dry mop after shower or swimming.
- Refer to both Audiologist and ENT specialist if perforation persists after 3 months.

CSOM

- Keep canal clean - see Box 1, page 1.
- Ciprofloxacin ear drops (without steroid) - 4 drops in the ear twice a day. Advise parent / carer to press on ear to push the drops down the canal. Continue drops for 7 days.
- Review at day 7, if ear is still discharging pus, continue dry mopping / syringing and give ciprofloxacin drops in the clinic / under supervision for another 7 days.
- Review at day 14 – if ear is still discharging pus, send a swab of the ear pus to the laboratory for MC&S and discuss results with ENT. Perform audiometry and if abnormal refer to audiologist for consideration of assistive learning devices.

OTITIS MEDIA WITH EFFUSION

1. **One ear involved** - perform audiometry (or refer to audiologist if under 3 years / unable to perform audiometry) If hearing is normal in "good" ear; review 3 monthly to ensure good ear remains normal. If hearing is abnormal in "good" ear; manage as for [both ears involved](#).
2. **Both ears involved** - review in 3 months. If persistent bilateral OME, give amoxicillin 25mg/kg/dose (max 1 gram/dose) twice a day for 4 weeks. At 4 week review, perform pneumatic otoscopy and audiometry. Refer to Audiologist and ENT specialist if bilateral OME persists, or unilateral OME with abnormal audiometry in "good" ear.

OTITIS EXTERNA

- Clean ear canal - careful dry mopping / gentle syringing if child allows (remember: often very painful).
- Sofradex ear drops, 2 drops 3 times a day for 7 days.
- For more severe infections (e.g. high fever, redness around the ear; tender lymph nodes behind the ear): (a) consider alternative diagnosis such as mastoiditis; (b) give flucloxacillin (25mg/kg/dose (max 500mg/dose)) liquid orally 4 times each day for 5 days.
- Keep ear dry (no swimming) while canal is still infected.
- Review on day 2 and on day 7 to make sure infection is settling.

Preventing Ear Infections

Advice for parents / carers on reducing the risk of ear infection: (also see [HEALTHY CHILD](#) protocol).

- Exclusive breastfeeding for 6 months, and introduction of plenty of healthy solids from 6 months on, reduces the risk of ear infection.
- Runny noses are a source of spreadable infection, so cleanliness is important (see [HEALTHY CHILD](#) protocols).
- Immunisation with Prevenar / Pneumovax may help reduce the risk of middle ear infection.
- No smoking near child or in closed spaces such as inside house or car.
- In general, swimming is good, but dry ears afterward.

Developmental Assessment

If the child shows any of the following, refer to pediatricians:

3 - 6 mo : not communicating by vocalising or eye gaze.

9 mo : poor feeding / oral co-ordination.

12 mo : not babbling.

20 mo : only pointing or using gestures (i.e. not speaking).

2 yo : using < 20 words, not following simple requests.

2.5 yo : mainly uses gestures, not understood well by family, needs requests repeated with gestures.

3 yo : using single or 2 word sentences, only understood by family.

4 yo : no joining of sentences, cannot describe recent events.

5 yo : cannot hold conversation, not asking lots of questions, not understandable all of the time, not joining sentences.

Hearing Loss

Most people with ear infections will also have a hearing loss. It is critical to not only treat the infection, but also manage the hearing loss in both children and adults.

Hearing loss can:

- Affect communication between people.
- Interfere with learning language in children.
- Make it difficult for children to learn in school.
- Interfere in learning culture, hearing stories and songs.
- Contribute to behaviour problems in children.
- Negatively affect adults in training programs and the workplace.
- Be a safety issue hinder hearing warning sounds like sirens, shouts, or hearing traffic when crossing a road.
- Lower self esteem and how people feel about themselves.
- Have negative effects on how people get on together.
- Be a contributor to domestic violence and feelings of suicide.

People need to:

- Understand the effects of hearing loss.
- Learn how best to communicate with a person with hearing loss.
- Know where to seek help for a hearing problem.

Advice for families/ friends of children with hearing loss

STUTTERING AT ANY AGE

The communication process always involves at least two people. As a result the speaker has certain responsibilities to assist the person with hearing loss or listening problems to understand the message they are giving. There are a variety of tactics a speaker can use to improve communication with people having hearing loss or listening problems.

Children 0 – 5 years of age:

These are the critical development years for children, not only for physical development like crawling, walking, fine and gross motor development but also sensory, speech/language and social development. Children who have suffered prolonged bouts of otitis media with conductive hearing loss often experience listening and learning problems later in childhood, even if the conductive hearing loss has resolved. These listening and learning problems can then carry on into adulthood.

Advice:

In addition to treating the otitis media, advice that would be given to carers and is **talk, talk, talk**. Provide as much verbal input to the child as possible. Talk directly to the child and not from a long way so the voice is louder. Information should be repeated with the use of as many visual cues as possible.

School aged children with hearing loss:

The behaviours of kids with hearing loss or listening problems, and kids who are being naughty can appear to be very similar. Often people will react to the child with a hearing or listening problem as if the child is being naughty and the child may be punished. Situations like this can happen at home or at school. Children with hearing loss or listening problems who are unfairly punished do not know why they are being punished, which can harm the child's self esteem. In the school environment, a child experiencing hearing loss or listening problems may be withdrawn and not participating in activities.

Or they may be disruptive, because being not able to understand what is going on, they may get frustrated and/or bored. When children are unable to communicate their emotions effectively, they often will "act out" their feelings.

Advice:

When dealing with a child who appears naughty, consider that the child may not be hearing or able to listen properly.

- Get the child's attention before speaking. In this way the child will know you are talking to her / him.
- Speak in short sentences.
- Do not speak too quickly.
- Whenever possible, let the child see your face when speaking. The voice is a little bit louder face-to-face, and the child has the opportunity to speech-read, as well as see facial expressions and gestures, which can aid in understanding.
- Use hand talk.
- Reduce the level of interfering background noise, by turning down the television or music, or by moving to a quieter area.
- Do not over-emphasize your speech. This causes unnatural facial movements, which can interfere with speech-reading.
- If the child does not understand your message, re-phrase the message rather than simply repeating it. Using different words gives the child a different opportunity to understand the message.
- Do not shout at children who are using hearing aids. The hearing aids should be providing the necessary amplification.
- Do not get angry at a child who has difficulty understanding what is being said. It is not their fault they may have a hearing loss or listening problem.
- Be patient.
- Be aware of the possible effects of low esteem and self worth in kids who have hearing and listening problems. They need understanding and support.

Appendix B - Hearing Questionnaire

Newborn to 4 months

- Are you worried about the baby's hearing?
- Do sudden, loud noises wake the baby?
- Does the baby cry at very loud noises?
- Does an awake baby jump at sudden, loud noises like a door slamming or a dog barking nearby?

3 to 4 months

- Are you worried about the baby's hearing?
- Does the baby sometimes turn its eyes or start to turn its head to see where a noise comes from?
- Is the baby distracted from feeding by moderately loud noises close by?
- Does the baby "jump" to sudden loud sounds.

4 to 7 months

- Are you worried about the baby's hearing?
- Does the baby frequently turn straight to sounds?
- Does the baby make a variety of babbling sounds?
- Does the baby enjoy playing with noisy toys or objects?
- Can you soothe the baby with your voice?

7 to 9 months

- Are you worried about the baby's hearing?
- Does the baby turn to find things heard but not seen?
- Does the baby gurgle, coo or babble to unseen sources of voices or other sounds?

9 to 24 months

- Are you worried about the child's hearing?
- Does the baby show pleasure when hearing sounds like the bath running, food being prepared or kids coming home?
- Does the baby copy words and sounds?
- Does the baby by about 15 months use some single words?
- Does the baby respond when you call from another room?

24 months to 5 years

- Are you worried about the child's hearing?
- Does the child talk like most other kids his or her age?
- Does the child act like he or she is not paying attention, ignoring you or acting naughty?
- Does the child seem to have difficulty understanding what you have said?
- Does the child turn up the TV loudly?
- Does the child frequently ask "What?" or ask for you to repeat what you have said?

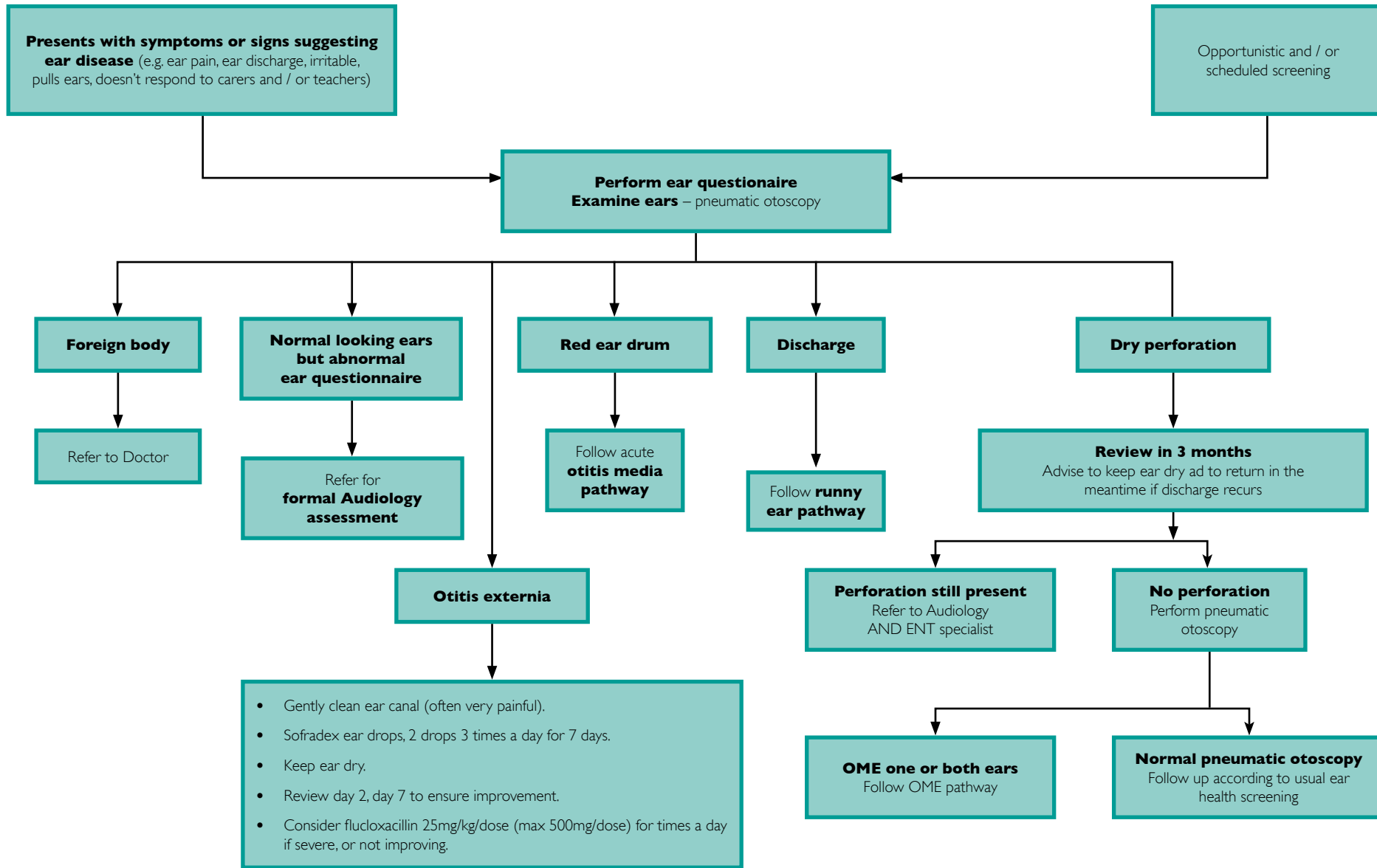
5 years and up

- Are you worried about the child's hearing?
- Does the child talk like most other kids his or her age?
- Is the child doing well as you would like at school?
- Does the child seem to have difficulty understanding what you have said?
- Has the school told you the child is acting up, is not paying attention in class or does not seem interested in school?
- Does the child turn up the TV too loud?
- Does the child frequently ask "What?" or ask for you to repeat when you are talking to them?

| Provider | Phone | Fax |
|---|--------------|--------------|
| East Kimberley Audiologist (OVAHS, Kununurra) | 9168 1288 | 9168 2053 |
| West Kimberley Audiologist (KPHU, Broome) | 9194 1630 | 9194 1633 |
| KAMSC Regional Ear Health coord. (based at DAHS, Derby) | 9193 1090 | 9191 2679 |
| Australian Hearing Services – East Kimberley (via Darwin) | 08 8945 5511 | 08 8945 5522 |
| Australian Hearing Services – West Kimberley (via Perth) | 9226 7100 | 9486 7921 |

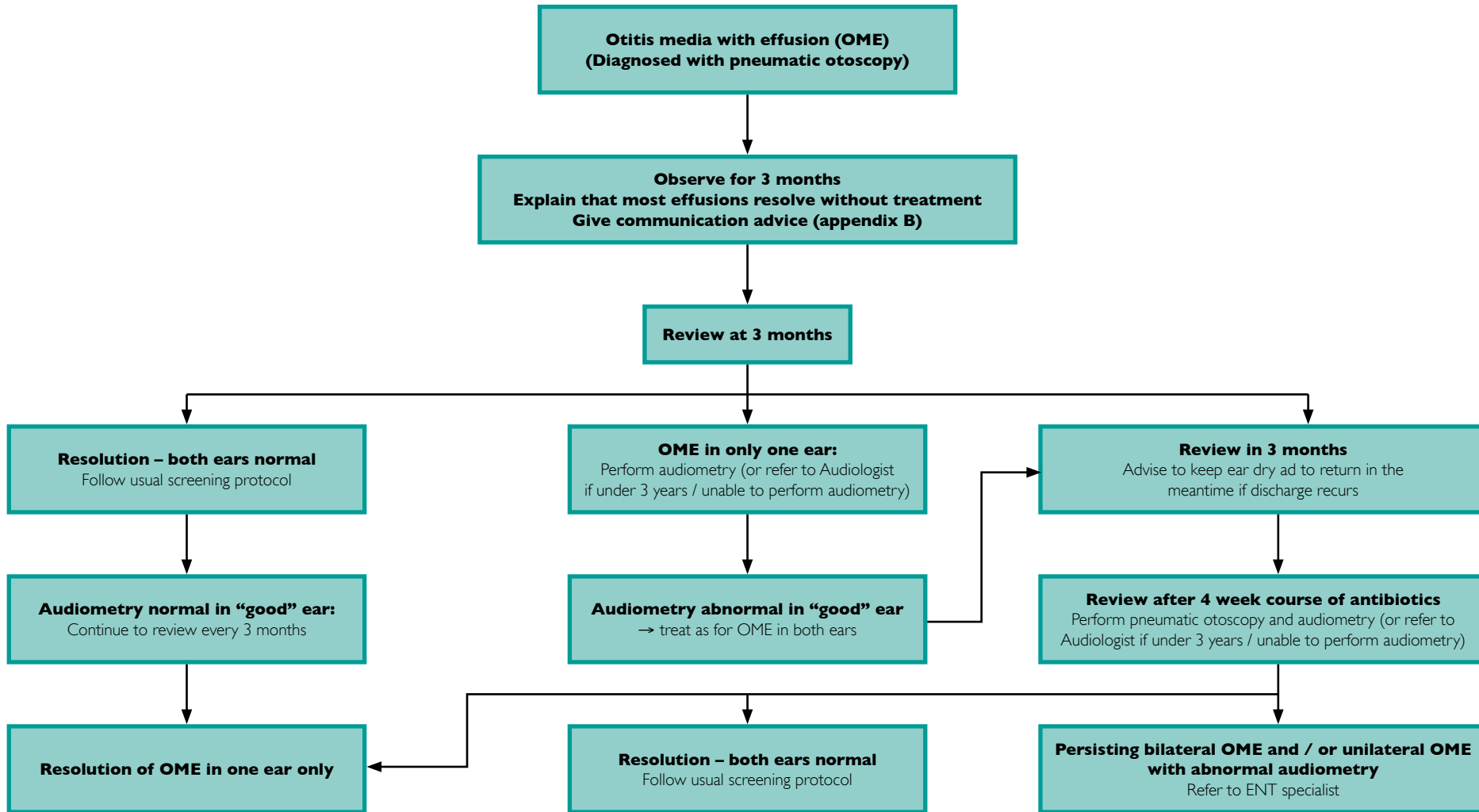
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