

## Key Questions on Ear disease and hearing problems

Mr Harry RF Powell & Professor Shakeel R Saeed

1 In adults complaining of gradual onset deafness, what conditions should I be excluding – and how – before considering referral for a hearing aid? Which patients should be seen by an ENT consultant and which can be sent directly to the audiology department to have a hearing aid fitted?

As with any presenting complaint a thorough history and examination are the key to reaching a differential diagnosis. The tuning fork tests can be used to help differentiate between a sensorineural and conductive loss. A number of conditions require a formal audiogram to support or confirm the diagnosis including noise induced hearing loss (NIHL) and otosclerosis. If there are associated features such as asymmetrical or intrusive tinnitus, vertigo, the hearing loss is asymmetrical, or otoscopy is abnormal then referral to ENT is warranted.\*

If there is a history of previous / long-standing noise exposure, ear infections as a child, previous ear disease or ear surgery your discretion is required to decide whether the patient can be referred direct to audiology or needs specialist referral. Recent ear infection or upper respiratory tract infection should be treated and allowed to settle as the hearing loss may resolve over 4-6 weeks. Young adults (<45) with progressive hearing loss with or without a positive family history should be referred to ENT.

Older patients (>65) with a progressive history of symmetrical hearing loss, normal tympanic membranes and most likely age-related hearing loss (presbycusis) should be referred direct to audiology. If the audiologist picks up anything of concern the patient can then be referred on to ENT.

2 I'm aware that 'sudden onset' of unexplained unilateral sensory deafness requires urgent referral. But how sudden is 'sudden', how urgent is 'urgent' and what are the possible causes and treatment?

Sudden onset sensorineural hearing loss (SNHL) is immediate or progressive hearing loss within 24 hours - often the patient notices it on waking in the morning. Urgent referral should be to an ENT emergency clinic or accident and emergency at a hospital with an ENT department. Patients should be referred immediately. If they present out of hours they should still be referred so they can be seen first thing the next day (including weekends).

In approximately 60% of cases the aetiology is unknown and this is termed idiopathic sudden SNHL. In 60% of idiopathic cases there is spontaneous resolution but this does not reduce the need for urgent referral. There are 4 possible pathophysiological explanations:

- Viral, with a history of recent viral infection or seroconversion.
- Vascular compromise by embolism, thrombosis, spasm or reduced flow due to the cochlea being an end organ with no collateral blood supply.
- Intra-cochlea membrane rupture.

- Immune mediated inner ear damage.

The patients have a formal audiogram performed; blood tests sent for autoimmune profile, viral and syphilis serology; and magnetic resonance scan of the internal auditory meatus arranged. Immediate treatment consists of high dose oral steroids and oral anti-viral medication for 7 days. Regular review with repeat audiogram at maximum weekly intervals initially, should be arranged. Intra-tympanic steroid injection should be considered depending on response to medical treatment after 1-2 weeks.

3 GPs often see patients troubled by persistent muffled or impaired hearing which seems to be secondary to Eustachian Tube dysfunction. How long do these problems take to resolve, what treatments help and when should these patient be referred?

The important thing once again is to exclude potentially serious pathology and the need for referral with a thorough history and examination. Patients can describe problems with muffled or fluctuating hearing and an intermittent blocked feeling. Popping or crackling particularly on swallowing and symptoms when flying are often indicative of Eustachian tube dysfunction (ETD). We must be careful however not to lay blame on the Eustachian tube for all symptoms that are difficult to explain.

In the presence of recent upper respiratory tract infection +/- concurrent sino-nasal symptoms with either normal examination or evidence of effusion it is reasonable to treat patients with a combination of nasal decongestants, nasal topical corticosteroid, nasal douche +/- steam inhaling. Symptoms should improve or resolve within 4-6 weeks if there is an inflammatory component to the ETD. Persistent unilateral middle ear effusion should be referred to rule out pathology in the post-nasal space. When symptoms are not improving patients should be referred to ENT so that tympanometry and a formal audiogram can be performed prior to decisions about further investigation. If there is a suspicion of measurable hearing loss and the presence of other symptoms as described in answer 1\*, specialist referral is indicated.

4 Persistent or recurrent otitis externa is a common and troubling problem in hearing aid wearers. How should GPs manage this?

In the primary care setting the key is prevention. Patients should take water precautions – aiming to prevent water from getting into the external auditory canal (EAC) by putting cotton wool in the conchal bowl and covering this with Vaseline to repel water when showering / bathing. When swimming, patients should use earplugs and a cap and should avoid putting their head underwater. Allowing the external auditory canal time to breath when there are periods of quiet during the day, by taking the aid out for 30 minutes to an hour at intervals, can help reduce the amount of sweat and moisture build-up. It is

important to keep the hearing aid mould clean by washing it regularly and or wiping it with an alcohol or baby-wipe.

Open fit hearing aids have been introduced for some levels of hearing loss. These devices have a hole in the mould enabling the EAC to breath while still wearing the hearing aid. Their other advantage is that sound pressure can leave the EAC so that sounds such as chewing, coughing, and the patient's voice are not exaggerated.

Infection should be treated in the usual way. Aural toilet is key if there is significant build-up of debris and this may necessitate referral for microsuction. Topical antibiotic drops with or without corticosteroid should be used as the first line medical treatment with follow-up to check improvement / resolution. The patient should avoid using their hearing aid if possible for the first 2-3 days and be careful of potential transfer of bacteria from one ear to the other.

5 What is the current evidence regarding potential hearing damage caused by the use of personal music players with earphones? How should this translate into specific advice - usually for worried parents?

Noise exposure is not only the main avoidable cause of hearing loss both recreationally and occupationally but also a major cause of tinnitus. Listening to personal music players with excessive volume can cause long-term damage to the cochlear. However, there is no evidence that listening to personal music players at reasonable volume levels leads to hearing loss later in life, this fact can be used to reassure parents.

Biological variability means that individuals are susceptible to damage at different noise levels. Noise induced hearing damage is related to the volume and duration of exposure. Occupationally the safe exposure limit is 85 decibels for 8 hours a day. Generally noise louder than 90 decibels (a lawnmower) will cause pathological changes. Damage to the cochlea is cumulative. Adults and children should be advised that listening to personal music players with earphones or headphones loudly could damage their hearing. Generally, if the music can be heard clearly by those around them, then this is too loud.

6 Patients often ask 'what sort' of external hearing aid they're likely to receive after referral. What advice can I give them and what are the pros and cons of the various devices?

The hearing aid(s) a patient will receive depends completely on the type and degree of their hearing loss. The lesser the degree of hearing loss, typically the smaller the hearing aid. It also depends on which frequencies, if not all, are affected. Fully behind the ear (BTE) hearing aids are still most commonly prescribed due to their fitting range (power) and ease of use. Smaller in the ear (ITE) hearing aids are not routinely fitted in the NHS and are only used in very special circumstances where a BTE hearing aid is not appropriate. There will usually be a medical reason why a BTE aid cannot be worn, not just a cosmetic one. In a patient with a typical age related hearing loss (where high frequencies are mainly affected) an open ear fitting can be done with a BTE hearing aid. With these devices no ear mould is needed and sound is fed into the ear canal via a

very thin plastic tube. The benefit from such an open fitting is better quality of sound as there is no 'echo' caused by an occluding ear mould. This is also more discreet and comfortable. There are many different types of hearing aids available these days, but which one the patient ends up with also very much depends on their lifestyle and day-to-day needs. An audiologist will be able to advise on the best amplification options available for the patient's individual hearing loss and requirements.

#### 7 Who should be considered for a cochlear implant?

Patients with severe to profound sensorineural hearing loss (SNHL) should be considered for cochlear implantation. They should be referred direct to a cochlear implant programme for formal assessment or locally to ENT so they can be referred on if appropriate. For cochlear implantation severe to profound SNHL is defined as hearing only sounds > 90dB at frequencies of 2 and 4 KHz without conventional hearing aids. Adequate benefit from acoustic hearing aids in adults is defined as a score of 50% or greater on Bamford-Kowal-Bench (BKB) sentence testing at a sound intensity of 70 dB (a speech discrimination score of > 50%). In children it is speech, language and listening skills appropriate to age, developmental stage and cognitive ability.

Unilateral cochlear implantation is recommended as an option for people with severe to profound deafness who do not receive adequate benefit from acoustic hearing aids.

Simultaneous bilateral cochlear implantation is recommended for children, or adults who are blind or who have other disabilities that increase their reliance on auditory stimuli as a primary sensory mechanism for spatial awareness.

People with a unilateral implant should be considered for sequential implantation if it is thought they will gain sufficient benefit from a second implant by the multi-disciplinary team.

More information can be found on pages 4 and 5 of the NICE guidelines:  
<http://www.nice.org.uk/nicemedia/pdf/TA166Guidancev2.pdf>

8 In a patient complaining of mild deafness but not seeking an aid, how can I be sure I'm not overlooking significant pathology such as otosclerosis or acoustic neuroma? How important is it to diagnose such conditions 'early'?

If the hearing loss is unilateral or asymmetrical and there are other symptoms as described in answer 1\* then specialist referral is recommended. If a conductive loss is suspected and there is no recent URTI with normal otoscopy, otosclerosis is a possibility. Early diagnosis will not necessarily change the management in otosclerosis. Generally if the patient is able to manage without a hearing aid they are unlikely to want surgery at that stage, however progression of the otosclerosis can make the surgery more challenging and early diagnosis is

always preferable. It would also enable a 3-month window for a trial of hearing aid.

Modern imaging techniques have led to an increase in the diagnosis of small vestibular schwannomas. Approximately 50% of vestibular schwannomas do not grow after diagnosis hence the wait and re-scan policy in the vast majority of patients after diagnosis. When the tumour is growing this tends to be slow. These are benign tumours but once again early diagnosis is preferable. If a tumour is growing there may be a window of opportunity for treatment with attempted hearing preservation.

9 Under what circumstances should patients with impacted ear wax be referred to the ENT department rather than having their ears syringed in primary care?

In the first instance, ear drops for example cerumol, sodium bicarbonate or olive oil, should be used to soften the wax. 2 weeks of treatment II-III drops TDS/QDS for 2 weeks is advisable then re-examination. Syringing can then be attempted. Patients with a history of recurrent otitis externa or a possible tympanic membrane perforation should be referred for microsuction. With a history of previous ear surgery or ear disease discretion is required to decide whether referral is indicated.

10 Many elderly patients are unsure whether to take up the offer of a hearing aid. Does early treatment affect the outlook in any way?

If a patient is struggling with their hearing loss they should be referred for consideration of a hearing aid. The patient can then be seen by audiology and given the options with expert advice and support. They will then be better placed to make an informed decision as to whether they need a hearing aid and whether they actually want one and will use it. There is still stigmatisation associated with hearing aids and some patients would rather not wear one. These patients may change their mind once they have had a trial of a hearing aid. Even if they decide not to wear the aid in public they can derive significant benefit in one to one situations or at home watching television. Less severe hearing loss is easier to aid as is more uniform loss where all frequencies are affected similarly, that said hearing aid technology is improving all the time. Early aiding does not slow the progression of hearing loss in presbycusis, however patients that refuse hearing aids gradually become more socially isolated as their hearing loss progresses. With time they learn to lip-read and rely on this more. Early aiding definitely has benefits; patients can get used to the technology and the differences with normal hearing when they are younger and more dextrous, before the hearing gets worse and is harder to aid.