Hear and Now

Why GPs need to think again about age-related hearing loss

The Panel

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Dr Lorraine Gailey's background predominately lies in psychology as well as speech and language therapy, having attained a PhD in the psychology of lip reading from Queen's University of Belfast. She then became a lecturer in applied psychology at the University of Ulster. Dr Gailey, as well as being a trained speech therapist, has a national and international reputation for her understanding of the psychosocial impact of acquired hearing loss. She was Head of Clinical Communication Studies at the University of Ulster, before moving in 1988 to become CEO of Hearing Link (*www.hearinglink.org*), a voluntary-sector organisation supporting adults with acquired hearing loss and their families across the UK.

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Cover *Inner ear hair cells*
Steve Gschmeissner/ Science Photo Library.
Coloured scanning electron micrograph (SEM) of sensory outer hair cells (stereocilia) from the organ of corti, in the cochlea of the inner ear. These cells are surrounded by a fluid called the endolymph. As sound enters the ear it causes waves to form in the endolymph, which in turn cause these hairs to move. The movement is converted into an electrical signal, which is passed to the brain. The V-shaped arrangement of hairs lies on the top of a single cell. Magnification: x21,000 when printed 10cm wide.

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Introduction

Why GPs can't afford to ignore hearing loss. The story is familiar to every GP: older people who are depressed, socially isolated and unable to cope with many demands made by day-to-day life. They make numerous visits to A&E, do not attend day centres – and so become ever more isolated - and mishear instructions about their medication. Of course, everyone's hearing worsens as we get older. However, in this report, a panel of multidisciplinary experts argues that encouraging provision of high quality, comprehensive NHS hearing care within local, 'non-clinical' settings helps GPs manage many of their core priorities, while reducing the stigma that surrounds age-related hearing loss (ARHL) and helping people live full and fulfilled lives.

The UK's population is growing rapidly and people are living longer. Government statistics estimate life expectancy for children born between 2008 and 2010 at about 78 years for boys and 82 years for girls.[1] Indeed, 32% of boys and 39% of girls born in 2012 in the UK can expect to celebrate their 100th birthday.[2]

We may be living longer, but we are not necessarily living well for longer. In 2006-08, men and women could expect to spend 81% and 79% of their lives in very good or good health.[3] The fifth or so of our lives we spend in suboptimal health – which can be 20 years or more – represents a huge public health challenge with the growing population of older people.

Table 1 - Hearing loss in 40-69 year old people in the UK[4]

Proportion	Problem
1 in 3	Self-report difficulty hearing conversation in noisy environments
1 in 4	Self-report hearing difficulty
1 in 5	Self-report tinnitus
1 in 5	Show visual impairment
1 in 10	Show difficulty identifying speech when listening in background noise
1 in 50	Use hearing device
3 in 100	Have dual (ear and eye) sensory problems

Against this background, a recent large study of the UK population found that 1-in-10 adults aged from 40 to 69 years failed a hearing test that involved repeating words in the presence of a background noise (table 1).[4] Hearing problems may have a greater impact today than in our parents' and grandparents' generation, reflecting changes in employment patterns, leisure and communication methods. Over the past 100 years, the workforce has changed from predominantly manual employment to service-sector jobs that rely on good communication skills. Where previously we required good physical fitness, we now require good 'communication fitness'. Furthermore, the age at which we expect to retire is rising with the result that a larger proportion of working life is likely to coincide with significant hearing loss.

Hearing difficulties also present problems away from work. Historically, we maintained contact with family and friends, and conducted business by writing letters. Today, we increasingly use mobile phones and internet applications such as Skype. We live in an era where the ability to hear well is crucial to a normal happy life.

Hearing loss affects more than the ears

ARHL (presbyacusis) is very common and affects more than the ears, reaching into many core clinical concerns for GPs by undermining a person's physical, emotional, mental and social well-being. While ARHL cannot yet be reversed, it can be managed through the provision of appropriate hearing technologies and auditory rehabilitation. For example, people using hearing instruments (previously called hearing aids) can be more socially active than non-users with hearing loss.[5] In addition, hearing instrument users experience fewer extended periods of depression, worry, paranoia and insecurity than most non-users.[6]

In many cases, family members and friends are more likely to notice these benefits than the users.[6] Indeed, 'significant others' encourage about half of people with hearing loss to initially seek help.[7] People are more likely to follow their family's encouragement to seek referral when access to services is convenient.

Furthermore, ARHL is associated with an increased rate of dementia and falls. For example, compared to people with normal hearing, the incidence of all-cause dementia was 89% higher in those with mild hearing loss, 3-fold higher in people with moderate hearing loss and almost 5-times higher for severe hearing loss.[11] Moreover, each 10 dB worsening of hearing loss is associated with an increased likelihood that a person will report a fall over the preceding 12 months by 40%.[12] Integrated care pathways offer GPs the opportunity to tackle such mutually reinforcing problems by drawing on multidisciplinary expertise across boundaries. The advent of Any Qualified Provider (AQP) allows patients, guided by GPs, to choose from a range of approved providers based on clinical need and other factors such as waiting lists, convenience or being closer to home. The AQP model is the same as the traditional hearing instrument services in terms of requiring no payment from NHS patients and being attended to by an audiologist with the same training and education.

People typically take about 8 to more than 20 years between noticing hearing difficulties and seeking professional help.[7] There is, therefore, a need to reduce this delay and avoid unnecessary suffering, economic burden and functional impairment. Indeed, Hearing Link regularly helps people with hearing loss who remark: "Why did I wait so long?". The charity also runs residential courses to help people with hearing loss adapt. In their experience, earlier identification and management would prevent many of the issues and problems associated with hearing loss. Anything that helps reduce the delay between recognising a hearing problem and seeking help for it, and between initial help-seeking and active management, is likely to reduce the negative impact of the hearing loss. Convenient local NHS providers that have short waiting lists and are easily accessible may facilitate earlier detection and management of ARHL. GPs should provide information that helps empower people with hearing loss to choose their preferred service provider, ensuring that they are managed at a convenient location that suits their needs.

Overcoming stigma

Changes in hearing and vision are natural consequences of ageing. In common with age-related visual changes, technology can modify these problems. However, encouraging people to use hearing instruments means overcoming the considerable stigma that still surrounds hearing loss.

For example, while 1-in-10 adults aged from 40 to 69 years failed a hearing test that involved identifying words in the presence of a background noise (table 1 page 1) only 1-in-50 used a hearing instrument.[4] Professor Munro notes that 6 million people in the UK could benefit from hearing instruments. However, only 2 million have hearing instruments and about 20% probably do not use them optimally. In the panel's experience, convenience is critical to help ensure concordance, whether with a hearing instrument or a drug. If a person with ARHL can 'drop in' and get a problem with their hearing instrument fixed in a convenient and local NHS service, the panel's experience is that they are much more likely to continue to use the hearing instrument.

"Being hard of hearing is a social position, not just a clinical 'problem'. ARHL is at one end of the 'hearing loss' continuum and should be seen as an issue for society to remedy."

Dr Stuart McClean University of the West of England, Bristol.

Several factors contribute to the underuse of hearing instruments, including perceived lack of benefit[13,14] (which may be addressed by talking to family members[6]), comfort, fit, appearance[14] as well as denial and stigma.[13] The stigma associated with hearing loss seems to arise from three inter-related factors: altered self-perception, ageism and vanity.[13] For example, hearing loss and instruments could lead to people feeling 'disabled' rather than 'able', 'cognitively impaired' rather than 'intelligent', identified as an old person and unattractive or undesirable.[13] Furthermore, people may feel that ARHL 'devalues' their identity as they perceive the hearing loss as a deviation from the 'norm' rather than a natural, albeit manageable, aspect of ageing. The person may perceive the stigma as shameful – a 'spoiled identity' dominated by shortcoming, failing, or handicap, and for which they may fear discrimination.[15]

Characterising age-related hearing loss (ARHL)

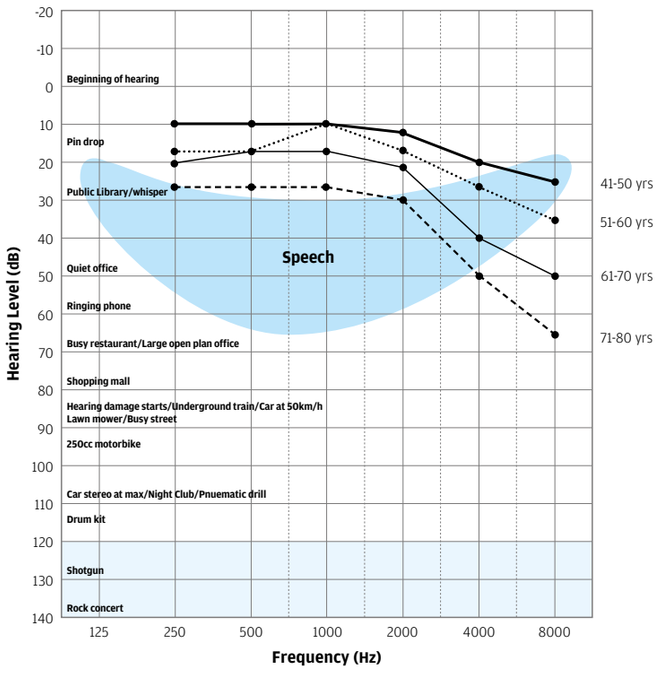

Figure 1: Audiogram showing that sensitivity to high frequency tones declines with age

The ear detects a wide range of sound levels and tones. A whisper is around 30 dB on the logarithmic decibel scale, while a loud shout is about 90 dB – a million times more 'intense'. Pain or discomfort in the ear arises at around 120 dB – a thousand times more intense than a loud shout. Figure 1 offers some environmental comparisons.[8]

The ear is 1,000 times less sensitive at 100 Hz (very low frequency) than 1,000 Hz, which prevents us from hearing our body's vibrations and movements.[1] Some children can detect sounds of 40,000 Hz, although our sensitivity to these high frequency tones declines with age (figure 1) – as shown on the audiogram.[8,9]

In general, vowels are louder (40 to 65 dB above the threshold of perception) than consonants (as little as 20 dB above threshold). Vowels also tend to fall within a lower frequency range (250 to 1,500 Hz) than consonants (over 1,500 Hz). Especially weak (low volume, high frequency) consonants – such as 'h', 'f', 'th' (as in thin), 's', 'sh', 'p', 't' and 'k' – account for between 20% and 25% of the sounds in spoken English.[8]

The level of hearing loss is described by the ability to detect pure tones at certain decibels (table 2 page 6). People with mild hearing loss do not detect tones at 25 to 45 dB; those with moderate loss do not detect tones at an average of 45 to 65 dB; and those with severe hearing loss may not detect sounds at 65 dB or more.[10]

However, audiograms based on listening to pure tones do not give a full impression of the impact of ARHL. Experiencing difficulties holding a conversation in a noisy room (see checklist page 16) – is often one of the first signs of ARHL, and this is not obvious from the pure tone audiogram. Because of the low volume and high frequency of weak consonants, people with ARHL often initially lose their ability to discriminate consonants, which are important to convey the intelligibility of speech.[8]

In part, modern hearing instruments – which can be almost invisible – can overcome some of the issues relating to the stigma, such as feeling unattractive. However, people with ARHL like to exercise an element of control (such as over hearing tests and use of hearing instruments) in their dealings with healthcare providers.[7]

"A local audiology setting may increase the person's feeling of control and autonomy, which are central to self-efficacy and empowerment models of health promotion. Health promotion should be democratic, needs driven, and about taking control and enhancing decision-making. This could bolster psychological and community empowerment."

Dr Stuart McClean University of the West of England, Bristol.

Furthermore, a patient presenting with ARHL is unlikely to complain of feeling 'deaf' and, therefore, their instinct may be that a hearing instrument is unnecessary. People with ARHL may complain that they can hear, but that they can't hear clearly. Modern digital hearing instruments provide the user with greater clarity – ARHL is a problem defined by a loss of clarity not just loss of volume.

Societal forces help perpetuate the stigma associated with hearing loss.[13] Most health care – between 70% and 90% – takes place within the informal lay network (discussions between non-medically qualified people, without reference to a professional).[16] These discussions can help perpetuate stereotypes and raise barriers to care, such as suggesting, rightly or wrongly, that waiting times in hospitals will be excessive.

A change in how people view health as they move along the life course helps fuel the stigma around ARHL. Traditionally, older people tended to focus on health as function:[16] whether they are well enough to take part in their work, hobbies and other activities of everyday life. However, this is changing as more older people regard themselves as fit and so focus less on function as an indicator of health and well-being.

Indeed, illness is a 'subjective, psychological experience' created by mental and physical symptoms. 'Sickness' refers to a societal recognition of illness, such as a doctor diagnosing a disease or taking time off from work.[16] So, for many individuals, a 'condition' diagnosed and managed in a conventional healthcare setting – such as a hospital – contributes to the impression of 'sickness' and that they have a medical problem. Over time, many physical and mental changes associated with 'normal' ageing have come to be seen as medical problems. Solutions to the 'problems' become the domain of clinicians. Many people even see ageing as a type of chronic disease that can be alleviated, though not cured, by medicine.

Stigma is often a consequence of, and may be more likely to arise through, clinical intervention and settings. Referring people with ARHL to a hospital-based audiology service potentially perpetuates the impression for some people that hearing loss is a disease that they experience as sickness. However, many people with ARHL may not feel sick, or describe themselves as such, and so the current system may perpetuate low uptake in accessing services. Therefore, a local NHS provider in a non-clinical setting may counter the stigma arising from the medicalisation. In turn, a demedicalised local setting may normalise ARHL, reducing the negative evaluation that many people associate with the condition. Therefore, any potential threat to self-identity (e.g. stigma or biographical disruption) can be less abrupt. In time, the panel believes that this change in attitude will filter back through the lay networks, highlighting the lack of delays and inconvenience in accessing services and encouraging more people to regard ARHL as normal – creating a virtuous cycle.

Case study: A missed opportunity

Judy, a 76-year-old former teacher lives alone in a first floor flat. She has suffered from depression since the death of her husband three years ago. Over the past year, she has made five visits to A&E, including two visits following falls. Judy also suffers from anxiety, hypertension, osteoarthritis and diverticular disease.

She was discharged after her latest admittance to hospital, following a fractured neck of the femur sustained while falling down the stairs, with a six-week package of care. After a routine home visit as part of the Integrated Care Pathway, the GP assessed Judy as having unaddressed ARHL. Indeed, Judy had been referred to an audiology clinic a year before, after her daughter reported progressive hearing loss. However, Judy declined the audiology assessment after a friend told her 'you'll be waiting in the hospital for hours'. Judy does not drive and she struggled to get an appointment that was convenient for one of her daughters to take her to the hospital.

Judy admitted to the sympathetic GP that she feels increasingly isolated. She is unwilling to take part in day-centre activities, which she once enjoyed, partly because she finds it so hard to hear in a noisy hall. Judy's only regular visitors are her two daughters, both of whom work during the week, and her young grandchildren. She finds it hard to understand what her daughters and grandchildren are saying and no longer looks forward to their visits. The GP believes that poor hearing may be exacerbating Judy's depression and anxiety.

However, the GP persuaded Judy to agree to attend her local AQP audiology service. Her daughter accompanied Judy on a Saturday appointment and they collected Judy's hearing instrument the following weekend. The hearing instrument improved Judy's social isolation (she subsequently began attending the day centre again), depression and anxiety.

Early referral to a local audiology AQP would probably have prevented the original defaulted hearing assessment. Wearing hearing instruments would have allowed Judy to devote more cognitive resources to balance and gait. In addition, her anxiety about her health and her persistent fear of dying at home alone contributed to several of her A&E visits. The hearing instruments reduce her day-to-day anxiety and, as a result, she's less likely to 'panic' about her health. So, improving Judy's hearing earlier would potentially have prevented at least some of her visits to A&E.

Medicalisation overburdens primary care

Increasingly, later life reflects our consumer culture: today's over-sixties grew up with and matured with consumption.[17] On the other hand, there is a growing tendency against medicalisation as patients voice their consumer rights, supported by many health professionals,[16] who already feel overburdened.

The growing number of people presenting with ARHL could overwhelm primary care audiology services. Therefore, lowering and, whenever possible, removing barriers to assessment, diagnosis and intervention is imperative to reducing the disability and costs associated with ARHL.

The report's premise

Against this background, this report argues that changes in hearing, as with changes in vision, are natural consequences of ageing. Emerging evidence suggests that a healthy and varied diet, and regular exercise can slow the progression of ARHL.[18] In the meantime, encouraging provision of high-quality, comprehensive NHS hearing care within local, 'non-clinical' environments, and staffed by skilled professionals, has several potential benefits, including:

- increased visibility and greater public awareness about hearing care
- challenging out-dated and discriminatory attitudes towards hearing loss
- increased recognition and acceptance of age-related changes in hearing
- empowering people with ARHL and encouraging people with hearing loss to seek help
- reduced accessibility issues for people seeking help for hearing loss and facilitating adequate follow up
- facilitating earlier detection of changes in hearing that limit effective communication and compromise quality of life
- emphasising management plans based on shared decision-making
- encouraging uptake of hearing instruments and other interventions
- increased long-term adherence, benefit and satisfaction
- value for money for the NHS and social services

We hope that this report is the first step on the road that ends in people regarding attendance at a local audiology service for ARHL as naturally as they do a trip to the opticians or check up at the dentist.

The heavy burden of age-related hearing loss: more than just ears. There is no known single cause of ARHL but, as we age, physical changes take place in the inner ear. Loss of hair cells and spiral ganglion neurons can contribute to a decline in ARHL as can, albeit rarely, loss of elasticity in the eardrum and stiffening of the joints in the ossicles (figure 2).[19] Genes, excessive exposure to loud noises, smoking and certain conditions, such as diabetes, may also contribute to ARHL.

The symptoms of ARHL worsen over time and inevitably compromise an individual's ability to enjoy everyday life and can have physical consequences: for example, hearing loss is associated with a higher incidence of falls.[12] Impaired hearing can also lead to psychological problems, such as anxiety and depression, as well as social isolation leading to an overall decline in quality of life.

Many people feel that hearing loss is a 'disease' and fear being perceived as frail or vulnerable by others, or start to self-identify themselves as being 'sick' or senile. Because of this fear of being stigmatised, they can be reluctant to address hearing loss. As a result, hearing loss can often go unmanaged and worsen until there is significant social impairment.

Delaying care can also seriously exacerbate the impact of co-morbid conditions, notably Alzheimer's disease and dementia. Indeed, hearing loss is independently associated with incident all-cause dementia after adjustment for sex, age, race, education, diabetes, smoking and hypertension. The risk of all-cause dementia increased with hearing loss severity. For individuals aged more than 60 years, over one-third of the risk of incident all-cause dementia was associated with hearing loss.[11]

Table 2 - Hearing loss severity[18]

Hearing loss	Decibel (dB) hearing level
Mild	25-45 dB
Moderate	45-65 dB
Severe	65+ dB

Although there is no cure for hearing loss, technology such as hearing instruments, telephone amplifiers and cochlear implants (for severe hearing loss), in parallel with support such as counselling, speech-reading training and hearing tactics, can help improve individuals' everyday function and well-being. Over the years, there have been huge advances in hearing instruments technology.[19] By seeking advice early, individuals can avoid some of the negative impacts that ARHL can have on physical, social and psychological well-being.

Physical well-being

Loss of hearing as we age may have consequences on physical health, which could undermine overall well-being and quality of life, and compromise a person's ability to remain independent. People with hearing loss may have co-existing problems with balance and experience problems with walking and mobility. In a study from the United States of America, which looked at 40 to 69 year-old adults, greater hearing loss was independently associated with self-reported falls over the preceding 12 months.[12] The magnitude of the association of hearing loss with falls was clinically significant, with a 25 dB hearing loss (the equivalent of going from normal to mild hearing loss) associated with a nearly three-fold increase in the odds of reporting a fall over the preceding year.[12]

A more recent study from Poland, which looked at the risk of falls in older people with visual and hearing impairments, concluded that sensory impairment may add to the number of falls, and that it should be adequately addressed.[20] A study from 2009 reached a similar conclusion, finding that hearing acuity correlated with mobility, which may be explained by the association between impaired hearing and

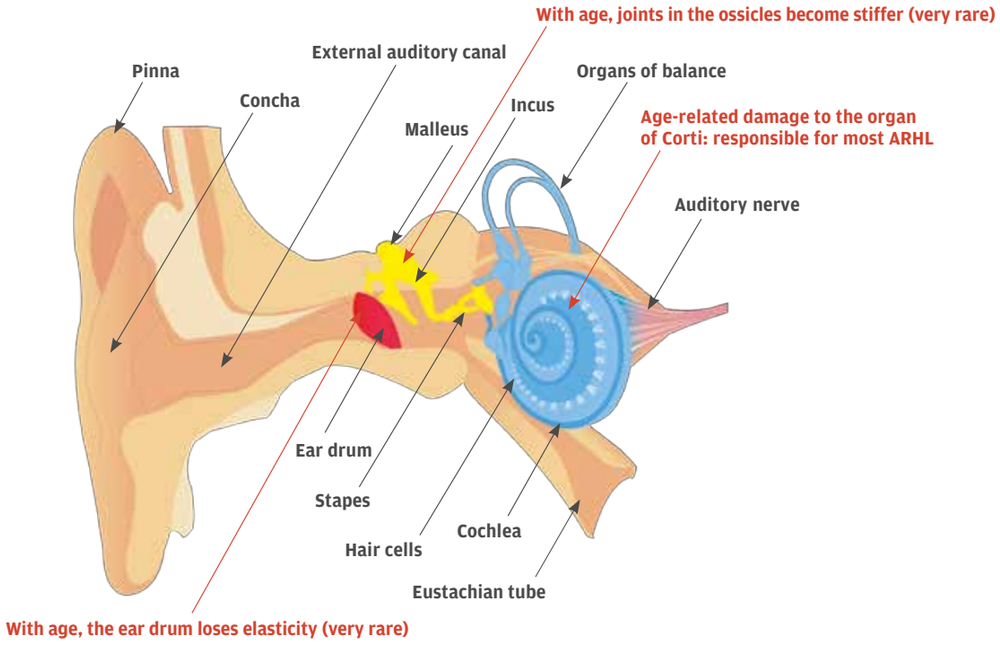

Figure 2 - Age-related changes that contribute to ARHL[19]

poor balance, and a greater incidence of falls, both of which underlie a decline in mobility. The authors emphasised the need to act on hearing loss: 'Prevention of hearing loss is not only important for the ability to communicate, but may also have more wide-ranging influences on functional ability'.[21] If those with ARHL feel unsure and nervous of leaving the house for fear of falling, this will hinder their ability to complete everyday tasks and will increase their sense of isolation.

The effects of ARHL are accentuated in those with co-morbid conditions, such as Alzheimer's disease. In fact, the presence of a central hearing deficit may help predict the development of Alzheimer's disease – giving strength to the argument that hearing loss needs to be managed early. Some of the symptoms of hearing loss and dementia may be confused and the combination of hearing impairment and dementia is likely to increase the number of symptoms and, perhaps, their severity.[22]

Psychological well-being

A wealth of evidence suggests that ARHL has a negative impact on psychological well-being (see boxout page 8). In a study looking at the benefits and costs of early screening for hearing loss, 12% of people aged 55 to 74 years had a hearing problem that caused moderate or severe worry, annoyance or upset.[23] As feelings of worry and annoyance are exacerbated by worsening hearing loss, some very serious psychological symptoms can appear. For example, when sensory input is diminished, people feel a sense of being imprisoned and anxious, and this may be mirrored in the experiences of many older people with hearing loss.[24]

> "We need to recognise that hearing loss is so much more than about hearing loss, it can have huge impact both socially and psychologically and indeed physically."
>
> **Dr Sarah Jarvis** GP.

These psychological effects are very common in people with hearing loss compared with those without impaired hearing. In the first major study of psychosocial effects, 39 (19%) of the 205 hearing-impaired subjects who completed a survey were

screened as being disturbed compared with 5% of the general population.[24] This is quite shocking and, in fact, the authors believed that the figure of 19% might be an underestimate.[24]

A reduction in overall well-being contributes to the development of psychological effects, such as anxiety and depression, and those with hearing loss have reported experiencing problems more often than those without hearing loss. The study mentioned also looked at overall health and well-being, and considered factors such as: physical disability; getting to sleep; staying asleep; having enough energy; consulting a doctor about a nervous problem; satisfaction with general state of health; and worry.[24] Hearing-impaired people were significantly 'worse off' than controls in all categories, except getting to sleep.[24] Of the hearing-impaired respondents, 28% reported further health problems while only 13% of the control group reported any health problems at all, including hearing loss. The only area in which there was no difference at all was in responses to questions measuring suspiciousness.[24]

Examples of the psychological consequences of hearing loss

- Avoidance and withdrawal – by the hearing-impaired individual due to fear of failure and by those who must interact with them for fear of being misunderstood (likely to be worse among older than younger adults)
- Depression
- Suspiciousness and paranoia
- Social rejection – as a result of the inability to understand what is being said
- Fatigue – caused by trying to hear and trying to make oneself understood by others who do not hear well
- Increased endangerment to safety – caused by failure to hear alarm signals or locating sources
- Embarrassment – caused by mishearing or misunderstanding, leading to withdrawal from communication situations
- Negativism – slowness to respond or lack of response
- Increased irritability – associated with experiences of failure
- Increased tension – particularly increased marital tension
- Dominates conversation – the hearing-impaired individual may engage in monologue to avoid questions, becoming a social bore; boredom may also develop as channels of communication are closed to the hearing-impaired person
- Increased vulnerability to promises of restored hearing – similar to a disabled person who hopes for a cure
- Acting upon misinformation – older people with severe hearing loss may respond inappropriately to cues, and others who interact with them may similarly respond inappropriately to cues from the hearing-impaired individual
- Diminished opportunities to participate in the workplace and/or assume leadership roles – partly as a result of retirement, which is exacerbated by hearing loss
- Reduction in amount of information – compounded by hearing loss in older people[24]

Perceived stigma

Many individuals avoid addressing and dealing with their hearing loss as they are afraid of being stigmatised as 'differing from the norm'. But hearing loss is a natural part of ageing and can be addressed effectively. The consequences of a delay in seeking advice can exacerbate the psychological issues. By the time people seek help, they may already be suffering with distressing psychosocial effects caused by their hearing impairment.[24] The possibility of loneliness and withdrawal caused by unaddressed hearing loss in middle age should not be ignored.[24]

Isolation and quality of life

Healthcare professionals have reported the impact of hearing loss on the ability to interact with others, leading to social isolation.[20] One clinical psychiatrist recalls seeing a gentleman with hearing loss and dementia, and describes how the hearing loss affected his quality of life.[22] She says: 'His hearing problem was most likely isolating him further from his surroundings and adding to his confusion. His communication was impaired since he found it difficult to hear the questions asked and became frustrated.'[20]

Sensory impairment interferes with reception of the spoken message and, hence, people with sensory loss frequently experience communication breakdown. The inability to communicate can lead to feelings of isolation and significantly impair psychosocial functioning. Older adults, in particular, may experience problems adjusting to sensory loss. The resulting depression, anxiety, lethargy and social dissatisfaction have a negative impact on quality of life and feelings of well-being.[25] Dual sensory loss (vision and hearing) is becoming a more common condition seen by clinicians as the world's population ages.[25] Professor Munro notes that cognitive decline is greater in people with dual sensory loss than in those with visual or auditory impairment alone.

Moreover, one study examined the associations of self-reported dual sensory impairment with everyday competence in self-reported activities of daily living among adults aged 70 years and older. Those with sensory impairment reported higher levels of functional disability at baseline and at two-year follow-up than those without sensory impairment, but the effect gradually diminished over time. However, the findings highlighted the importance of vision and aural rehabilitation programmes for older adults to mitigate the impact of sensory impairment.[26]

Effective, early management of hearing loss minimises the effect on their ability to carry out daily tasks. For example, a survey of 2,069 hearing-impaired individuals and 1,710 of their family members found that hearing instrument users were more likely to report improved physical, emotional, mental and social well-being than non-users with hearing loss.[6] Users of hearing instruments were, on average, more socially active and avoided extended periods of depression, worry, paranoia and insecurity compared to non-users with hearing loss. Additionally, family members and friends were more likely to notice these benefits than the users[6] underscoring the importance of involving family members in diagnosis and follow up.

Early care is needed

People with ARHL are often reluctant to address the problem for fear of being stigmatised or because of a perception that their hearing loss is a disease, which has implications for their self-identity (i.e. they will see themselves as 'sick' or 'senile'). If people with ARHL do not receive the care they need early on, the impact on physical, psychological and social well-being will not only undermine quality of life, but will also impose a heavy burden on the NHS in terms of costs and resources.

> "Lowering and, whenever possible, removing barriers to assessment, diagnosis and intervention is imperative to reducing the disability and costs associated with ARHL."
>
> **Professor Kevin J Munro** University of Manchester.

A 2012 study highlighted the need for early diagnosis of hearing loss and the development of support services that address the felt stigma and potentially isolating experiences of older people with hearing loss.[7] However, GPs will be stretched by the proliferation of individuals with ARHL who present with the associated co-morbidities (e.g. depression, anxiety and dementia). Referring people with hearing loss to local, convenient audiology services goes a long way to providing people with ARHL with the support they need. As long as ARHL is effectively managed early on by a suitably trained individual at a location convenient for the hearing-impaired person, those affected can live independently with a higher quality of life for longer.

The economics of age-related hearing loss: a complex calculation. The population of the UK is growing apace and people are living longer. As a result, ARHL will impose an increasing economic burden on the NHS, informal carers and society more widely. However, a full appreciation of the costs of ARHL care needs to encompass the economic impact of the co-morbidities. Local NHS audiology providers potentially help control the direct costs and reduce the indirect costs associated with ARHL.

There are currently around 60 million people in the UK and the Office of National Statistics (ONS) forecasts that the population will reach 73.2 million by 2035. The numbers of older people will increase more rapidly than any other segment of the population. For instance, in 2010, 1.4 million people in the UK were aged at least 85 years. The ONS suggests that the number of people aged 85 years and over will rise to 1.9 million by 2020 and to 3.5 million by 2035.[27]

As a result, age-related diseases will impose an increasing burden on the NHS, informal carers and society more widely. For example, 17% of people older than the current retirement age report hearing loss and 13% have impaired sight. Overall, approximately 6.4 million people aged over 65 years live with hearing loss. About 685,000 of these have severe or profound hearing impairment.[28]

In 2010/11 NHS England spent £450 million managing hearing problems,[29] a figure that will inevitably increase as the population ages. Indeed, the NHS is already the largest purchaser of hearing instruments in the world. Therefore, there is an imperative to ensure that the NHS receives optimal value for money. Professor Munro notes that only 2 million of the 6 million people in the UK that could benefit use hearing instruments and about 20% probably do not use them optimally, suggesting that much of this investment is currently wasted.

The costs of co-morbidities

However, the costs of hearing care by the NHS do not paint the full economic picture. Long-term costs can be considerable as co-morbidities begin to develop. For example, as mentioned before, ARHL increases the risk of depression and dementia, and is associated with a higher incidence of falls.[6,11,12] The EURODEP study reported that 14.1% of women and 8.6% of men aged at least 65 years suffer from a depressive disorder that needed treatment.[30] Unfortunately, outcomes among older people with depression are often worse than in younger people.[31] Treating depression costs the NHS more than £520 million a year: £237 million for hospital care, £230 million for antidepressants, £46 million for doctors' time and £9 million for outpatients' appointments.[44] Therefore, preventing depression by addressing ARHL as well as other risk factors will help reduce the clinical and economic burden imposed by depression.

The Alzheimer's Society estimates that caring for a person in the community with mild dementia costs £16,689 per person rising to £37,473 for severe dementia.[33] "Properly" managing hearing loss in people with dementia will save at least £28 million per year in England largely by delaying residential care.[34] In addition, informal care accounted for 36% of the total cost of £17 billion imposed by dementia in the UK.[33] A local audiology provider means that carers do not lose as much time from work, which helps contain the increasing indirect costs associated with dementia, while improving access to convenient services for this vulnerable group.

Similarly, a third of people aged over 65 years, and half of those aged over 80 years, fall at least once a year. Falls cost the NHS more than £2 billion per year.[35] Again, this fails to capture the indirect costs (e.g. lost productivity by patients and carers) and intangible costs, such as pain and suffering.

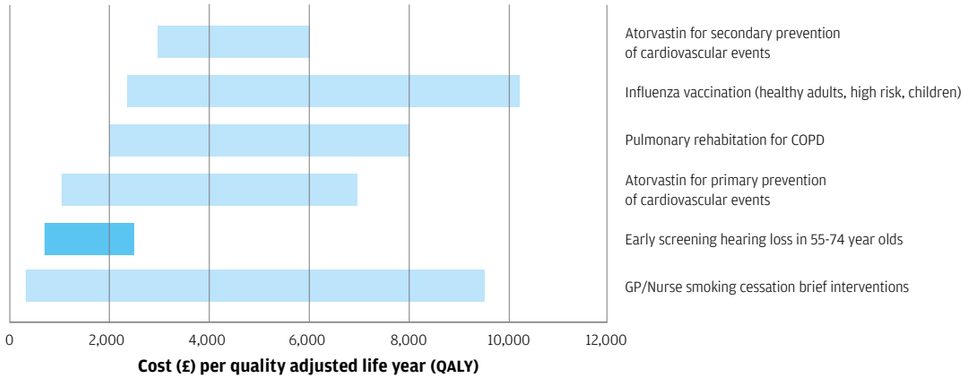

Figure 3: Early screening for hearing loss in people aged 55-74 years is cost effective compared to other common interventions [23,37-39]

The growing societal costs

As noted in the introduction, we live in an age where communication fitness is a pre-requisite for a full and fulfilled life. For example, hearing impairment may prevent us from communicating with ease, affecting employment opportunities. A 2006 report for HEAR-IT stated that lost productivity due to hearing impairment costs the UK around £18 billion a year. However, as this figure does not take into account the lower earnings of hearing people who are employed, it is likely to be an underestimate.[24]

Not all of these people have ARHL. Nevertheless, a million people over 65 years of age are working or seeking work.[36] The indirect costs associated with ARHL are set to increase as people retire later over the next few years.

The benefits of early intervention

Hearing instruments improve social functioning and quality of life – even for people with mild hearing loss. However, early use is important to optimise long-term outcomes.[32] In the future, the use of technology for people with normal hearing to improve clarity of speech in noisy environments will help normalise the use of auditory technology and, the panel believes, help encourage early uptake. In the meantime, there is a need to reduce this delay and minimise the unnecessary economic burden.

Screening for hearing loss is cost-effective. Indeed, as figure 3 shows, the cost per QALY of early screening for hearing loss in people aged 55 to 74 years is cost effective compared to other common interventions.[23, 37-39] Furthermore, recent modelling work suggests that it is cost effective to screen adults for hearing problems and commence intervention at age 60 years instead of the current situation of GP referral around age 75 years.[32]

According to this analysis, the most cost-effective option was a one-stage audiometric screen for bilateral hearing loss ≥30 dB at 60 years of age, repeated at 65 and 70 years of age. This option was associated with an estimated incremental cost-effectiveness ratio of £1,461 compared to GP referral. The model estimated that the process would result in an additional 15,437 adults benefiting from hearing intervention per 100,000 of the population aged 60 years. The cost effectiveness modelling did not account for additional benefits to the economy (e.g. increased employment opportunities), healthcare (e.g. offsetting other long-term conditions), and social care (e.g. increased ability to live independently). Therefore, the benefits offered by screening are likely to be more than this.[32]

Demographic changes mean that the number of people with age-related diseases will rise rapidly over the next few years. Tackling ARHL will help contain these costs, although further research is needed to quantify the benefits. However, in the panel's view, a full appreciation of the costs of hearing loss and the implications of changes in service provision from the perspective of a GP practice needs to encompass the expenditure associated with co-morbidities. Focusing on the costs of managing hearing problems alone does not paint the whole picture.

Models of service: from hospitals to high streets. Service structures, policies and practices can create hurdles that hinder - and even prevent - some people with ARHL from receiving the support they need. Local NHS audiology offers the opportunity to lower some of these barriers while tackling the stigma surrounding ARHL. Furthermore, the primary care team is ideally placed to offer opportunistic and targeted screening for ARHL that helps detect more cases, earlier and so improve outcomes.

Since 1948, the NHS has provided services that are free at the point of delivery. However, for people to benefit, appropriate and inclusive services must be available to all those who need them when they require them. As noted previously, people typically take about 8 to more than 20 years between noticing hearing difficulties and seeking professional help.[7] Therefore, there is a need to reduce this delay and avoid unnecessary suffering, expenditure and functional impairment.

"Early intervention has the potential for people to be more productive, work for longer and be less reliant on others. They may also be able to live independently for longer, bringing benefits to family and partners."

Professor Kevin J Munro University of Manchester.

Moreover, the Department of Health increasingly promotes choice of access point for people and clinicians. For example, patients and GPs can now choose from a range of qualified providers in hospitals or the high street based on waiting list, outcomes or convenience. As such, local and accessible NHS audiology services offer the opportunity to lower some of the barriers to care of people with hearing loss and help tackle the stigma surrounding ARHL.

Listening to people with hearing loss

Services need to reflect and respond to the people who use them. A survey completed by 101 people including Hearing Link members, volunteers and beneficiaries identified four areas as the most important elements in audiology services:

- receiving a good service
- being treated with respect and courtesy
- being treated by someone who understands hearing loss
- being treated by professionals with knowledge of each individual's circumstances

Furthermore, 72% of respondents regarded being given convenient times for appointments as very important or important. Moreover, 51% said that not having to wait long for an appointment was very important or important. People wanted the appointment to be of an appropriate length and run to time.

Seventy-six per cent of respondents commented that the location or accessibility of a hearing service was important (48%) or very important (28%). Respondents also valued the ability to keep or very quickly access spare equipment, such as being seen for repairs within 24 hours. Against this background, table 3 (see page 14) summarises the essential elements of a high-quality audiology service.

Meeting needs

To a certain extent, the service model that best meets the needs of people with hearing loss depends on local circumstances. All people presenting to GPs with hearing loss should always be referred to an audiology service (see page 16). However, the panel agreed that when local audiology services are not available, trained practice and district nurses, and a range of other healthcare professionals, could screen patients for ARHL and refer appropriately using the checklist developed by the panel on page 16, as well as help with basic maintenance of hearing instruments. However, primary care nurses face increasing pressure on their time. So, where available, local providers could screen for, as well as manage ARHL, helping to free nurses time. While local services can effectively and efficiently manage 'routine and uncomplicated' hearing loss, more complex cases need to be referred to skilled specialist centres.

In addition, ARHL persists for the rest of the person's life. Therefore, management does not end with the provision of a hearing instrument. As a rule, people need to be reviewed after three months to ensure that they are gaining the most benefit from their hearing instruments, with regular follow up and reassessment to ensure that the device continues to meet their needs. A convenient service is valuable if people need help, maintenance and on-going care and support. The better the hearing instrument is adjusted to suit the needs of the user, the greater the benefit and the more likely people are to comply with the instrument. Convenience can increase the probability of compliance with a hearing instrument. In addition, people with ARHL should receive a full review and assessment every three years, which currently requires a GP referral.

"When a person recognises that they might have a problem with their hearing, they are more likely to seek help if the services are convenient."

Dr Lorraine Gailey CEO of Hearing Link.

Improving detection

ARHL is ubiquitous, offering numerous opportunities for opportunistic and targeted screening by GPs and the wider primary care team. Thus, opportunistic screening for hearing loss, such as difficulty in understanding speech, in an optician consultation and referring back to the GP is an effective means to detect ARHL. The impact of dual sensory impairment is obviously worse than auditory or visual deficits alone. A local provider that is cognisant of the two problems will help detect more people and avoid more problems. Further management is based solely on clinical need.

As discussed previously, ARHL can increase the risk of, or worsen outcomes with, numerous co-morbid conditions. Therefore, GPs could consider opportunistic screening of patients with one or more of the conditions in table 4 (see page 14). The checklist on page 16 offers a framework for opportunistic and targeted screening for ARHL.

"High street audiology providers create less disruption to a person's life and less disruption to their 'narrative of self' and so fit more easily into the idea of ARHL as part of normal ageing and help meet older people's aspirations."

Dr Stuart McClean University of the West of England, Bristol.

Table 3: Indicators of a Good Quality Audiology Service

Staff indicators	Someone who listened Being treated with respect and dignity Feeling that individuality is acknowledged
Environment	Clean treatment rooms Accessibility of clinics (including access times)
Timings of appointments	Convenience (where and when) Short waiting times for initial and follow up appointments
Other details	Having management options explained Confidence that up-to-date equipment is available Communication in general was very important Counselling about expectations from amplification

Based on unpublished research by Hearing Link that was further refined by the panel

Tackling stigmatisation

ARHL is a social position and not 'just' a clinical problem that needs a medical solution. However, doctors confer legitimacy on a 'disease'. So, diagnosing and managing ARHL in a highly medicalised setting – such as a hospital – helps foster an impression that ARHL is a 'disease' resulting in a 'disability' that requires a medical intervention. A hospital setting defines and reinforces 'ownership' of ARHL by clinicians and can create anxiety in the 'patient'. Such narratives help create a barrier to engagement with services and perpetuate the stigma that surrounds hearing loss.[13]

In contrast, a 'non-clinical', but professional, high-quality local NHS service helps to increase the person's (who is not a 'patient') sense of control and autonomy that is central to self-efficacy and empowerment.[41] In addition, a local setting offers a better 'cultural fit' with existing lay networks and beliefs about normal ageing, especially as people increasingly define health in old age in terms of 'fitness' rather than 'functionality'.[42]

Furthermore, the social categories that produce stigma are socially embedded and constructed.[43] Improved understanding of hearing loss and establishing a 'positive' cultural norm around ARHL challenges and helps change the attitudes, perceptions and behaviours that engender stigmatisation. Such embedded attitudes do not change overnight, of course. However, a high street setting demedicalises and normalises ARHL, and reduces the threat to the person's self-identity.

As such, the local audiology provision gains positive association in the minds of people with ARHL and the general public. In time, the panel hopes, 'normalising' ARHL could create a halo effect that reduces the stigma surrounding other forms of hearing impairment.

Table 4: Consider screening patients with one or more of these conditions

- Age-related memory loss
- Anxiety
- Cardiovascular disease
- Chronic renal disease
- Dementia
- Depression
- Diabetes
- Stroke
- Visual Impairment

- Modern life requires good 'communication fitness'. However, while 1-in-10 adults aged from 40 to 69 years failed a hearing test involving repeating words in the presence of background noise only 1-in-50 used a hearing aid.[4] Several factors contribute to this underuse, including perceived lack of benefit, denial and stigma.[13]

- ARHL undermines physical, emotional, mental and social well-being as well as being associated with an increased risk of dementia[11] and falls.[12] As such, ARHL influences several core clinical concerns for GPs.

- Early screening for hearing loss is cost effective compared to other common interventions. GPs could integrate opportunistic and targeted hearing checks into consultations for other conditions and routine health checks.

- The impact of ARHL can be lessened. People using hearing instruments are usually more socially active and less likely to endure extended periods of depression, worry, paranoia and insecurity than non-users with hearing loss.[6]

- Family members and friends may be more likely to notice the benefits of a hearing instrument than users.[6] 'Significant others' encourage about half of people with hearing loss to initially seek help.[7] People are more likely to follow their family's encouragement to seek referral when services are local and convenient.

- Many people take 8 to more than 20 years between noticing hearing difficulties and seeking professional help.[7] There is a need to reduce this delay and avoid the resulting unnecessary suffering, economic burden and functional impairment.

- The stigma surrounding hearing loss seems to arise from three inter-related factors: altered self-perception, ageism and vanity.[13] Referring people with ARHL to a hospital-based audiology service perpetuates the impression that hearing loss is a disease and that people are ageing. Therefore, a local NHS provider may counter the stigma arising from medicalisation. Convenience is central to ensuring concordance.

- In time, changes in attitude will filter back through lay networks, highlighting the convenience and lack of delays in accessing services when using local NHS providers and encouraging more people to regard ARHL as normal – creating a virtuous cycle.

- Lowering and, whenever possible, removing barriers to assessment, diagnosis and intervention is imperative to reducing the disability and costs associated with ARHL.

- In the meantime, encouraging provision of high-quality, comprehensive NHS hearing care within local, 'non-clinical' environments, and staffed by skilled professionals, has the potential to:
  - increase visibility and greater public awareness about hearing care
  - challenge out-dated and discriminatory attitudes towards hearing loss
  - increase recognition and acceptance of age-related changes in hearing
  - empower people with ARHL and encourage people with hearing loss to seek help
  - reduce accessibility issues for people seeking help for hearing loss and facilitate adequate follow up
  - facilitate earlier detection of changes in hearing that limit effective communication and compromise quality of life
  - emphasise management plans based on shared decision-making
  - encourage uptake of hearing instruments and other interventions
  - increase long-term adherence, benefit and satisfaction
  - provide value for money for the NHS and social services.

Hearing loss checklist

GPs could integrate opportunistic and targeted hearing checks into consultations for other conditions and routine health checks. Whenever possible ask the partner or another family member for their view of the person's hearing and the impact of hearing instruments.

GPs should refer anyone that exhibits, admits to, or is reported by a partner or family member as showing, at least one of the following to the most convenient NHS Any Qualified Provider (AQP) for a hearing assessment:

- Cannot hear speech clearly when listening against background noise, such as a noisy room or social occasion (e.g. a feeling that when people are speaking that any background noise present is overwhelming the speech they wish to hear)
- Asks frequently for words or phrases to be repeated
- Does not respond when spoken to
- Asks frequently for others to speak up or complains of mumbling
- Has difficulty following conversations involving two or more people
- Misunderstands what others say and responds inappropriately
- Has trouble hearing the speech of women and children
- Has TV or radio on loud, often missing the door-bell and telephone ring
- Has problems hearing on the telephone or turns volume up excessively
- Fails to respond to an environmental noise

Screen for, and ask partners and family members about, red flag signs and symptoms including:

- Active discharge or drainage from ear
- Pain or bleeding from ear
- Pus or blood in the ear canal
- Sudden onset or rapidly progressing hearing loss
- Unilateral or asymmetric hearing loss or tinnitus
- Pulsatile tinnitus
- Acute, chronic or recurrent dizziness
- Facial paralysis
- Trauma to ear canal
- Foreign body in ear canal
- Cerumen plug

Refer people with:

- Symptoms of hearing loss without red flag symptoms to audiology for assessment and provision of hearing instruments and accompanying management
- Minor red flag (e.g. asymmetrical hearing loss*, wax that is not removed by the practice nurse, tinnitus, positional vertigo) to audiology with access to ear care nurse
- Major red flag (e.g. perforated ear drum, pulsatile tinnitus, dizziness, vertigo that is not solely positional) for ENT assessment

*When asymmetry is due to a sensorineural hearing loss, this is a red flag and requires prompt referral, usually via ENT, for thorough investigation.

Please feel free to photocopy this checklist, which was developed by the expert panel.

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