

## ARTICLE

# Equity and person-centeredness in the provision of tinnitus services in UK National Health Service audiology departments

Derek J Hoare PhD<sup>a</sup>, Emily Broomhead BA (Hons)<sup>b</sup>, David Stockdale BA (Hons)<sup>c</sup> and Veronica Kennedy BA MB BCh BAO MSc FRCS (Oto) FRCPCh<sup>d</sup>

a Senior Research Fellow, National Institute for Health Research (NIHR) Nottingham Hearing Biomedical Research Unit & Otology and Hearing group, Division of Clinical Neuroscience, School of Medicine, University of Nottingham, Nottingham, UK

b Projects Manager, British Tinnitus Association, Ground Floor, Unit 5, Acorn Business Park, Sheffield, UK

c Chief Executive, British Tinnitus Association, Ground Floor, Unit 5, Acorn Business Park, Sheffield, UK

d Consultant Audiovestibular Physician, Bolton NHS Foundation Trust, Halliwell Health & Children's Centre, Bolton, UK

## Abstract

**Rationale, aim and objective:** Chronic tinnitus is a prevalent condition broadly managed using individualised sound-based interventions, individualised or group education, counselling, or cognitive therapies. In the UK, therapy is largely delivered by audiologists or hearing therapists and, where available, clinical psychologists and physicians. Changes in the structure of the health service necessitate ongoing evaluation to monitor equity and person-centeredness of care. The purpose of the current evaluation was to describe provision and explore diversities in the services provided for tinnitus patients across the four countries of the UK and consider these relative to current commissioning and clinical practice guidelines.

**Method:** A 37 item questionnaire was devised and distributed *via* email and social media to reach audiology departments in the UK and 147 valid responses were acquired during the 3 month period of the evaluation.

**Results:** The structure and provision of tinnitus services varies widely across the four countries of the United Kingdom in terms of which clinicians provide the services. Outside of England there was no report of clinical psychology or audiovestibular physician involvement in services. There is also variability in access to psychological therapy or support (little training in CBT in Scotland and none in Northern Ireland), self-help groups (little involvement but interest from clinicians) and devices (e.g., one quarter of departments do not currently offer combination hearing aid devices for tinnitus). Clinicians are increasingly using validated questionnaires to evaluate the effectiveness of tinnitus management in their departments.

**Conclusions:** Training in and the provision of psychological support for tinnitus patients by audiologists is particularly a concern for Scotland and Northern Ireland and has implications for the person-centeredness of audiology services. Capacity and need for research in paediatric tinnitus, combination devices, non-ear level sound devices and audiologist-delivered psychological therapy, are noted.

## Keywords

Audiology, care provision, clinical management, equity, evidence-based healthcare, healthcare quality, person-centered healthcare, self-management, service commissioning, service evaluation, tinnitus

## Correspondence address

Dr. Derek J Hoare, NIHR Nottingham Hearing Biomedical Research Unit, Ropewalk House, 113 The Ropewalk, Nottingham, NG1 5DU, UK. E-mail: derek.hoare@nottingham.ac.uk

Accepted for publication: 11 February 2015

## Introduction

Tinnitus, the phantom perception of sounds in the ears or head, is a prevalent condition affecting both adults and children [1,2]. It negatively affects quality of life for some of those who experience it [3,4] and represents a significant cost to healthcare systems and the economy [5,6]. In the absence of any effective treatment, chronic tinnitus is currently managed clinically by attempting to reduce the percept (with sound therapy) and/or reduce the negative emotional reaction to the percept (using

education, counselling, or cognitive behaviour therapy). In the United Kingdom (UK) this clinical management is largely delivered by audiologists, hearing therapists and, occasionally, clinical psychologists [7]. However, the organisation and availability of these services is variable and in a state of flux. Hearing therapist training has ceased and with a dearth of clinical psychologists working within audiology departments, audiologists are now required to upskill in psychological therapies in order to meet the emotional needs of their patients who have tinnitus [8]. Furthermore, National Health Service (NHS) hearing

services can now be offered by ‘any qualified provider’ (AQP) whereby patients can choose from a range of providers who meet NHS standards, prices and any contractual obligations [9]. Although the AQP scheme does not extend to tinnitus services *per se*, it is potentially the case that some individuals with tinnitus will have their hearing loss managed by non-NHS providers and so it remains to be seen whether or not the AQP scheme has had any noticeable impact on tinnitus services.

In the UK, commissioning of clinical services to manage tinnitus is informed by the Good Practice Guide (GPG) issued by the Department of Health [8] as part of its vision for improved access to audiology and service quality. The GPG recommends promoting self-management and that audiologists deliver sound therapy and (in the absence of clinical psychologists) psychological therapy options for the management of tinnitus. However, these recommendations are not evidence-based. There are no UK-produced practice guidelines for the management of tinnitus and no national quality standard. The National Institute for Health and Clinical Excellence (NICE) provides the public, health and social care professionals, commissioners and service providers with definitions of high-quality care, but although a quality standard for tinnitus has been referred to NICE one is not yet in development. Evidence-based guidelines have, however, emerged elsewhere. Tunkel *et al.* [10] produced an American Academy of Otolaryngology evidence-based clinical practice guideline for tinnitus. This guideline makes strong recommendations for the use of validated questionnaires of tinnitus severity and for the use of education and psychological therapy. Sound therapy on the other hand is only proposed as an option to consider because of its limited evidence of effectiveness. Practice in the UK seems to conflict with this recommendation as a previous evaluation found that almost all tinnitus patients are offered some ‘audiological’ management strategy such as a hearing-aid or sound generator, whereas the provision of psychological intervention was limited [7]. In addition, only 67% of clinicians in that evaluation reported using any form of questionnaire to measure outcome.

The purpose of the service evaluation described here was to further explore diversities in the approaches to care offered to tinnitus patients across the four countries in the UK, to gather intelligence on the current state of provision and to pose some specific questions to clinicians which are currently unanswered but which will inform the design and conduct of future research. We wanted to quantify more precisely what is offered and how it is offered. For example, there are no data in the public domain to account for the number of audiologists who promote self-management or recommend or supply devices such as sound pillow, table top sound generators, or combination hearing aids to their patients. This leaves us with gaps in any evaluation of equity or cost of care and raise questions as to whether there is a need for research on such interventions or whether there is sufficient interest and capacity to make research feasible. The design of randomised controlled trials (RCTs) also needs to begin with protocols that are feasible and adequately reflect current practice. We therefore sought to capture data on a

disparate set of issues that will potentially inform multiple projects.

At the time of writing it is five years since our previous evaluation of NHS audiology tinnitus service in England, UK [7,11]. At this time we were interested to explore current practice and ask topical questions. For example, have changes in service commissioning for hearing loss (to increase patient choice of providers) impacted on tinnitus services [9]? Has there been any change in the use of standardised questionnaires [12] or access to psychological therapies [13]? Is further work needed in these areas? The current service evaluation also affords us the opportunity to make a baseline comparison of current day audiology practices in the UK and the recent evidence-based recommendations of the American Academy of Otolaryngology [10].

## Methods

### Questionnaire development

Items for this service evaluation were decided through an iterative process. First, basic questions were generated to capture factual details about audiology departments to include location and structure of the service and treatment options offered. Questions were informed by previous evaluations [7, British Tinnitus Association unpublished], personal knowledge of the authors and Department of Health guidelines [8]. Second, questions were generated to capture specific information considered missing from the general tinnitus literature (such as the provision of certain resources) and to capture an opinion on current issues related to tinnitus management (e.g., issues related to hearing aid candidature arising from Sereda *et al.*) [14]. Questions were first drafted separately by individual authors (DJH, EB and DS) and then appraised or reduced by the same authors towards strong face validity and relative merit of the included items. The final questionnaire included 37 items (see Appendix 1) each providing either an open response option or nominal responses with an ‘other’ category.

### Distribution

The questionnaire was delivered online (surveymonkey.com) in June 2014 and closed in August 2014. A link to the questionnaire was emailed to all contacts registered on the British Tinnitus Association database of UK-based audiologists and NHS audiology departments (~200). A link was posted on the British Academy of Audiology website ([www.baaudiology.org](http://www.baaudiology.org)) and Facebook page ([www.facebook.com/baaudiology](http://www.facebook.com/baaudiology)). The questionnaire was further disseminated by a member of Phonak UK to his network of NHS audiology contacts. The sample was therefore purposive but self-selecting. As an incentive to complete the questionnaire participants were offered a free 12 months subscription for 2 copies of the British Tinnitus Association’s ‘*Quiet*’ magazine for their department.

## Data collection and analysis

Over 180 individuals registered to complete the questionnaire. Where two individuals within the same department were registered, one was selected as representative (EB contacted the respondents involved and asked them to select which response best represented their department). Questionnaires completed by clinicians working in the private sector were excluded from analysis, as were questionnaires completed by individuals from organisations not related to audiology services and from audiology services from outside the UK. In total, there were 147 valid submissions included in the analysis.

Responses were exported from surveymonkey.com into a Microsoft Excel database. Descriptive statistics and analyses were performed in Excel and IBM SPSS Statistics (version 21). Where relevant, differences in responses by country were determined using ANOVA or  $X^2$  tests, although with only 2 responses received from clinicians in Northern Ireland this analysis typically only included meaningful comparisons across England, Scotland and Wales. Responses to open questions (free-text answers) were minimal but for completeness were subjected to a summative content analysis [15] performed by DJH and VK.

## Results

There are 189 NHS organisations in total responsible for hospital-based NHS audiology services in the UK, categorised as acute NHS trusts in England ( $n = 162$ ), integrated Local Health Boards in Wales ( $n = 7$ ), NHS Scotland Health Boards ( $n = 14$ ) and Health and Social Care Trusts in Northern Ireland ( $n = 6$ ) ([www.nhs.uk](http://www.nhs.uk)). Of the 147 clinicians completing this service evaluation questionnaire 81 indicated that their organisation offered audiology services across more than one site. Duplicate entries, where two or more audiologists from the same department completed the survey, were filtered such that the results were representative of 145 different NHS hospital audiology department sites across England ( $n = 119$ ), Scotland ( $n = 14$ ), Wales ( $n = 10$ ) and Northern Ireland ( $n = 2$ ). A completed questionnaire was also received from the Ministry of Defence audiology department situated in Portsmouth, England and the Ministry of Defence Clinical Measurement Department based in Yorkshire, England. Respondents who specified their job role were heads of audiology, hearing therapy or adult audiology services ( $n = 35$ , 30%), audiologists/senior audiologists ( $n=44$ , 38%), hearing therapists/senior hearing therapists ( $n = 34$ , 29%), two clinical psychologists (1%) and one ENT consultant (<1%). Thirty one respondents did not indicate their job role.

The following sections consider service structure, tinnitus-specific training of clinicians and current practices and opinions related to the management of tinnitus within NHS audiology departments.

## Service structure

To obtain an impression of the services offered, participants were asked a series of questions related to how their service is accessed, their provision in terms of AQP, tinnitus tariffs and whether they offered a paediatric service.

Of 147 respondents, 142 indicated that their department accepts tinnitus patients by the traditional UK route of GP to ENT and then to audiology (this did not differ between countries  $X^2 = 0.0199$ ,  $p = 0.999$ ). However, the waiting time for an appointment by this route differed greatly between departments, from as little as 16 days for one department to 37 weeks for another ( $n=130$ ) respondents, mean waiting time = 9.0 weeks,  $SD=6.4$ ; where a range was indicated by the respondent the upper value was taken as the conservative response). The average waiting time was greatest in Northern Ireland (albeit based on only 2 responses). Sixty-two departments indicated that they accepted referrals directly from GPs into their tinnitus service. This did not differ significantly between countries although was not reported as a possible route in Northern Ireland ( $X^2 = 1.4298$ ,  $p = 0.699$ ). The waiting time for an appointment by this route was on average 2 weeks less, ranging from 2 to 18 weeks according to department ( $n = 54$  respondents, mean waiting time = 6.9 weeks,  $SD = 4.5$ ; where a range was indicated by the respondent the upper value was taken as the conservative response). Waiting time by this route differed across countries ( $F = (2,54) = 4.002$ ,  $p = 0.024$ ) averaging 6 weeks in England, 8.7 weeks in Scotland, and 10.1 weeks in Wales. Fifteen respondents indicated they offered open access to their service to patients who were previous users of the service or known to audiology or ENT service. Three of the 15 reported this option to be limited to an 18 month period since the patient last attended. Respondents indicated clinic attendance numbers between 1 and 100 per week (mean = 13.3,  $SD = 12.6$ ).

Most respondents reported that their tinnitus service involved senior audiologists and/or hearing therapists. Respondents from Northern Ireland indicated that their tinnitus service comprised senior audiologist(s) only. A number of respondents from the other 3 countries reported that their head of service and ENT were involved. Strikingly, however, only participants in England ever reported that their service included either audiovestibular physicians ( $n = 13$ ) or clinical psychologists ( $n = 10$ ). Eighty-nine respondents (61%) indicated that their department offered a paediatric tinnitus service, 53 (37%) did not and 5 (2%) did not respond to this question. This did not differ between countries ( $X^2 = 2.9064$ ,  $p = 0.406$ ) although both respondents from Northern Ireland reported not having a paediatric service.

We were interested to know how many departments were now offering services or competing within the AQP framework and whether AQP had any noticeable impact on what individual departments were providing. Seventy-three respondents (50%) indicated that their departments were now enrolled on the scheme. Impact to date appears to be minimal with comments from only a small number of individual senior audiologists and heads of service.

Comments concerned increased administration, tighter timescales, awareness of competition, AQP appointments being prioritised meaning tinnitus appointment waiting times are getting longer and concerns that tinnitus patients are getting managed for hearing loss, but not for tinnitus. For example, one respondent commented that they have received no onward referrals from AQP providers of hearing aid services commenting that *“either the GP's are getting it right every time and no tinnitus patients are being sent to them, or there are tinnitus patients at the AQP providers not getting appropriate help”*.

Analysis of waiting times according to whether or not departments accepted hearing loss patients under the AQP scheme showed there to be no impact for those tinnitus patients accessing audiology via the GP to ENT route ( $t(134) = 1.000, p = 0.333$ ), but for those departments who accept direct hearing loss referrals from GPs, AQP was associated with a *reduced* waiting time for tinnitus patients (4.9 compared to 8.4 weeks,  $t(51) = 5.530, p = 0.001$ ) suggesting an indirect positive impact of the scheme for tinnitus patients.

When asked if their department had a tinnitus tariff 85 (58%) respondents indicated that they did not, whereas 38 (26%, all from England) indicated they did and further that it covered therapist time and devices. The remaining 24 (16%) did not respond. This was not associated with AQP ( $X^2 = 0.142, p = 0.706$ ).

### Tinnitus specific training

Given the Department of Health suggestion that audiologists need to upskill in the provision of psychological support for tinnitus patients [8], we were interested to know how many audiology departments employed members of staff who had undertaken continuing professional development courses related to tinnitus. Of 147 respondents, 142 indicated that there were staff members in their department who had undertaken one or more courses (Table 1). Only 5 departments (2%) did not have a member of staff who had been on tinnitus-specific training. More attended courses were the University College London Ear Institute Tinnitus and Hyperacusis Masterclass (80% of departments; this did not differ by country,  $X^2 = 2.9832, p = 0.394$ ), and the European Tinnitus Course (55%). Both are 3-day courses. Seventy-one (48%) departments had a member of staff who had undertaken some form of training in CBT. Notably, neither of the respondents from Northern Ireland and only 2 respondents from Scotland (out of 14) had a member of staff in their department who had any training in CBT. Interestingly, only the 2 respondents from Ministry of Defence settings reported having a member of staff who had undertaken training in Tinnitus Retraining Therapy [16].

### Clinical provisions for the management of tinnitus

Talking therapy (education, counselling, CBT) is recommended in both the GPG [8] and the AAO Clinical Practice Guideline [10]. Sound therapy is recommended in the GPG, but (owing to a relatively weak evidence-base) is

listed in the AAO guideline as an option for audiologists to consider in the management of bothersome tinnitus, rather than a recommended intervention. In the current evaluation we wanted to know how standard the availability of education, counselling, CBT and different sound device options are across NHS audiology departments. In the case of many sound therapy options in particular this type of information has not been collected previously.

Table 1 Tinnitus continual professional development courses attended by audiology department staff members

	n	%
University College London Tinnitus Masterclass	118	80
European Tinnitus Course	81	55
Relaxation training	76	52
Cognitive Behaviour Therapy	71	48
British Tinnitus Association Tinnitus Advisor Training	60	41
Stress management	41	28
Mindfulness	39	27
Alternative therapies	22	15
Other counselling (not specified)	6	4
Queen Margaret University Introduction/advanced tinnitus management	3	2
Birbeck tinnitus course	3	2
University of Bristol Tinnitus Update Lecture Course	3	2
Tinnitus Retraining Therapy	2	1
Aston University Online tinnitus management course	2	1
University of Iowa tinnitus course	1	<1

When asked about information giving and psychological therapies, 121 respondents (82%) indicated that clinicians in their department offered patients written information on tinnitus. Twenty-nine (20%) indicated that their department offered group educational sessions; 56 (37%) offered CBT; 30 (20%) offered mindfulness; 99 (67%) offered hearing therapy listening strategies, 100 (68%) offered some form of relaxation therapy and just one department (<1%) offered hypnotherapy and massage.

In terms of sound devices that patients might use in self-management, 115 respondents (78%) reported having access to table-top sound devices of which 43 respondents (29%) were able to provide the device to the patients to keep, 45 (29%) had a table-top device for demonstration purposes and 26 (18%) offered the devices on a loan basis. A number of respondents reported having catalogues available for patients to use to purchase their own devices. Pillow speakers were available to keep from only 26 (18%) departments, but were used for demonstration by 47 (32%) and were available for loan from 9 departments (6%). Sound pillows were available to keep from 11 departments (7%), 29 (20%) had them for demonstration purposes only and 1 (1%) respondent indicated that their department loaned such equipment to patients. Just 19 departments (13%) had relaxation CDs available to provide to keep or

on loan. This is the first account of such self-management device availability and provision across the NHS and highlights one area where there are clear and unexplained differences in service.

Most respondents reported the provision of ear-level devices for tinnitus management. One-hundred and thirty-one respondents (89%) said that their department offered ear-level sound generators and 143 respondents reported that their department offered standard and open-fit hearing aids, albeit from a range of providers and 109 respondents (74%) said that they provide combination aids (hearing aid with sound generator).

### Hearing aids - questions on candidacy

Hearing aids are a common recommendation in the UK where there is tinnitus and a co-existing hearing loss [7]. However, the lack of a guiding evidence-base or clinical practice guidelines results in differences in their recommendation and use. Sereda *et al.* [14] recently used the Delphi technique [17] to define a set of criteria for hearing aid candidature and use where there is tinnitus and a mild hearing loss. Consensus in that study was defined as  $\geq 70\%$  agreement across the group of 29 experienced audiologists taking part. Here we asked participants whether or not they would agree with some of the criteria defined in the Delphi study. First, participants were asked if they agreed that 'Pure tone average worse than 20 dB in at least one ear' was a suitable criterion for hearing aid candidature for someone with tinnitus; 94 participants (64%) agreed that it was, 24 (16%) disagreed and 39 did not answer. When asked whether "hearing loss where thresholds are  $>35$  dB at 2 kHz" was an appropriate criterion to base a recommendation of hearing aids on for someone with tinnitus only 53 participants (36%) agreed, 21 (14%) disagreed and almost half (73) did not answer. Participants were invited to describe criterion they would themselves apply when considering whether to recommend a hearing aid to someone with tinnitus. Audiometric criteria proposed by one or a small number of participants included 'any loss greater than 15 dB', 'loss greater than 20 dB', 'greater than 25 dB where the patient mentions hearing difficulties', '30 dB loss and a wish to try hearing aids', 'a loss of 25 dB or more at 1 kHz', or a 'loss greater than 35 dB at 4 kHz'.

When asked about scenarios where they would recommend fitting either one or two hearing aids where there is at least mild hearing loss and bothersome tinnitus, 83 respondents (56%) would aid unilaterally if tinnitus was unilateral and 51 (35%) might only aid the worse hearing ear. Twenty-four respondents (16%) said they would never recommend unilateral aiding in tinnitus.

In the present study it was evident from free text responses that the clinical recommendation of hearing aid or aids for tinnitus is made on an individual basis that accounts for a patient's preferences and self-reported difficulties. The lack of standardisation has the benefit of meeting perceived patient need but an evidence-base to support commissioning of this flexible approach is lacking [18,19].

### Support groups/self-management

Self-help is recommended for tinnitus [8] and a major activity of the British Tinnitus Association involves supporting individuals and organisations to create and sustain support groups. Questions 36 and 37 of our evaluation (see Appendix 1) asked whether the responding clinician was involved in any local tinnitus support group, or would be interested in setting one up. Thirty-nine respondents (27%) were involved in a tinnitus support group, 106 (72%) were not and 2 (1%) did not answer. Of those not involved in a support group almost half (49) said they would be interested in being involved in one and a quarter (29) said they were interested in developing one themselves. This is clearly an area of service where there is potential for growth, but also one where the benefit of the activities needs to be demonstrated.

### How management outcome is assessed

Commissioning, clinical and research guidelines all recommend that the outcome of tinnitus management is measured using a validated questionnaire [8,10,20]. Respondents indicated that most departments (132, 83%) use some form of validated questionnaire as an outcome measure. The Tinnitus Handicap Inventory (THI) [21] is the tool most often used to assess management outcome (101 respondents, 69%). Table 2 also shows comparisons with our previous evaluation [12].

Table 2 Current use of self-reported outcome measures in the UK and use in England in 2009

Measure	n	%	% in England in 2009
Tinnitus Handicap Inventory	101	68	45
Hospitals Anxiety and Depression Scales	31	21	4
Tinnitus Functional Index	27	18	Not available
Self-devised measures	23	16	14
Tinnitus Questionnaire	20	14	1
None	20	14	33
Mini Tinnitus Questionnaire	7	5	<1
Client Oriented Scale of Improvement	3	2	2
Clinical Outcomes in Routine Evaluation	1	<1	0
WHO-Disability Assessment Schedule 2	1	<1	0
Insomnia Severity Index	1	<1	0
Hyperacusis questionnaire	1	<1	1
Depression Anxiety Stress Scales	1	<1	0
One or more of the above	132	83	67

Although only published in 2012 [22], the Tinnitus Functional Index is already the second most commonly used tinnitus questionnaire (27 respondents, 18%), followed by the use of 'self-devised measures (18 respondents, 12%) and the mini-Tinnitus Questionnaire (mini-TQ) [23]. The Hospital Anxiety and Depression

Scale (HADS) [24], was used in 31 departments (21%) although predominantly in departments where the team included an ENT doctor or audiovestibular physician ( $X^2 = 5.347$ ,  $p = 0.021$ ). Other questionnaires including the World Health Organization Disability Assessment Schedule (WHODAS) [25], the Clinical Outcomes in Routine Evaluation (CORE) [26], the Illness Perceptions Questionnaire (IPQ) [27] and the Hyperacusis Questionnaire (HA) [28] were in each case reported by one or two respondents only. One respondent notes that there are currently no self-report outcome measures suitable for assessing tinnitus in children.

## Discussion

Tinnitus management is part of what is a changing landscape in NHS audiological services so it is important to evaluate services to ensure equity of provision and that the person-centeredness of care is maintained or improved rather than lost. Here we evaluated service provision from the clinical perspective, across a reasonably representative sample of audiology departments and clinicians in different job roles and from across the four countries of the UK. The evaluation was somewhat exploratory as it was designed to gather disparate information to inform priority research ongoing in the UK and identify further questions likely to be of importance to the provision of equal access to care. In a small number of cases certain questions were unanswered by some respondents. This may reflect the range of clinical professions and job roles that we had in our sample and a lack of awareness of certain answers.

There are a number of interesting differences between this evaluation and that conducted five years ago [7]. Excepting that the current evaluation extended to the whole of the UK and not just England, a number of key issues identified related to service structure, provision of care, capacity for research and improved equity and person-centeredness of care.

The waiting time to an appointment with audiology was highly variable and there was a 2-week advantage for patients whose General Practitioner had the option to refer patients directly. Furthermore, waiting time was further reduced for departments where AQP was in operation suggesting the scheme is in fact having a positive consequence for tinnitus patients, although concerns were raised that some tinnitus patients may be inappropriately managed for hearing loss by some providers where their complex needs are not being met.

Service structure varies between countries. For example, respondents from outside of England reported there were no clinical psychologists or audiovestibular physicians involved in their service. Less than half of departments in the UK have a staff member who has training in CBT and only one third offer it as part of their standard care, primarily delivered by audiologists or hearing therapists. While CBT delivered by clinical psychologists has strong evidence for effectiveness [29], CBT delivered by audiologists or other hearing professionals has yet to be demonstrated as effective [30].

In Scotland and Northern Ireland provision is of particular concern where training of audiologists is essential to meeting those needs (e.g., [31]).

Tunkel *et al.* [10] recommends information giving. Reassuringly, the majority of departments offer written information on tinnitus. The sources, type and quality of this literature should be evaluated in future studies, assessing, for example, the content and reliability of the information using the DISCERN tool [32,33].

Sound therapy device use and availability was highly variable across departments. This variability may be acceptable for now; Tunkel *et al.* [10] suggest sound devices be considered as an option as opposed to recommended, until such time as there is sufficient research evidence on which to make a recommendation. For example, three quarters of departments currently offer combination (hearing aid and sound generator) devices for tinnitus, but despite there being such capacity for research there has only been one published trial of combination devices to date, conducted in the United States [34].

Hearing aids too, although a standard component of usual care, have little quality evidence of effectiveness for tinnitus [18,19] and are only suggested as an option to be considered in the clinical guidelines by Tunkell *et al.* [10]. The present evaluation raises questions on the feasibility of future research on hearing aids. For example, opinions expressed here on what minimum hearing loss should be present to consider recommending hearing aids to a patient, or the scenarios in which one or two hearing aids might be recommended, contrast with the consensus reported recently by Sereda *et al.* [14] where there was an almost unanimous agreement, for example, that where there is hearing loss and bothersome tinnitus hearing aids should always be fitted bilaterally. A clinical trial protocol which stipulates bilateral fitting in all cases of tinnitus may not be acceptable to the multiple sites that would be required for a large trial.

Most departments now use a questionnaire measure of tinnitus or general health as an outcome measure (83% here compared to 53% in 2009 reported by Hoare *et al.* [7], Table 2). Impressively, despite the TFI only being published in 2012 [27], almost one fifth of respondents reported that their department is already using it despite there being little effort in the UK to introduce it to clinics. Ongoing work to validate this questionnaire in the UK and elsewhere is essential to informing its use in clinical practice and research [35,36].

Involvement in support groups for tinnitus also varied by department. It is an open question as to whether these groups lead to tangible long term benefits for people with tinnitus. It is also questionable whether groups work best when lay-led (support groups) as opposed to clinician-led (self-management) and what components of self-management important for tinnitus benefit can be 'learnt' through self-help or support groups without a therapist or clinician. Research in the area has been minimal, but warrants attention given the variability in involvement in support groups of different departments [37].

## Conclusion

This work reaffirms that usual care for tinnitus in the UK is highly variable in terms of how the service is delivered, what is delivered and by whom. Patients will be offered different management options depending on which country they reside in and which department they attend. Priority research questions from the perspective of patients, clinicians and members of the public in the UK have previously been identified through a James Lind Alliance priority setting partnership [30,38], ([www.tinnitus.org.uk/jla](http://www.tinnitus.org.uk/jla)) and registered on the UK Database of Uncertainties about the Effects of Treatments (UK DUETs: [www.library.nhs.uk/duets/](http://www.library.nhs.uk/duets/)). These very specific interventions include specific questions around use of amplification, alternative therapies, insomnia, hyperacusis, managing tinnitus in deafness, assessment of tinnitus in paediatrics and more general questions such as which management options are more effective than a usual model of care. The current evaluation provides evidence of capacity for exploring many of these issues in multi-centre studies. Notably, there are many departments offering a paediatric tinnitus service, but to date research activity in the field is low [38] despite apparent capacity. A service evaluation to more fully understand the structure of paediatric tinnitus services is warranted however. Further, there appears to be various instances of unequal access to care and in its person-centeredness that deserve attention, particularly the provision and use of combination hearing-aid devices, the provision of non-ear-level sound devices and audiology department involvement in support groups.

## Acknowledgements and Conflicts of Interest

DJH is funded by the National Institute for Health Research (NIHR) Biomedical Research Unit programme, however, the views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health. Thanks to Chris Cartwright (Phonak UK) for distributing the questionnaire.

DJH is chair of the British Tinnitus Association Professional Advisers' Committee and occasionally acts as a media spokesperson for the charity. EB and DS are members of staff of the British Tinnitus Association and VK is a former member and chair of the British Tinnitus Association Professional Advisers' Committee.

The authors declare no conflicts of interest.

## References

- [1] McCormack, A., Edmondson-Jones, M., Fortnum, H., Dawes, P., Middleton, H., Munro, K.J. & Moore, D.R. (2014). The prevalence of tinnitus and the relationship with neuroticism in a middle-aged UK population. *Journal of Psychosomatic Research* 76, 56-60.
- [2] Park, B., Choi, H.G., Lee, H-J., An, S-J., Kim, S.W., Lee, J.S., Hong, S.K. & Kim, H-J. (2014). Analysis of the prevalence of and risk factors for tinnitus in a young population. *Otology and Neurotology* 35, 1218-1222.
- [3] Cima, R.F.F., Crombez, G. & Vlaeyen, J.W.S. (2011). Catastrophizing and fear of tinnitus predict quality of life in patients with chronic tinnitus. *Ear and Hearing* 32, 634-641.
- [4] Zeman, F., Koller, M., Langguth, B. & Landgrebe, M. (2014). Which tinnitus-related aspects are relevant for quality of life and depression: results from a large international multicentre sample. *Health and Quality of Life Outcomes* 12, 7.
- [5] El-Shunnar, S.K., Hoare, D.J., Smith, S., Gander, P.E., Kang, S., Fackrell, K. & Hall, D.A. (2011). Primary care for tinnitus: practice and opinion among GPs in England. *Journal of Evaluation in Clinical Practice* 17, 684-692.
- [6] Yankaskas, K. (2013). Prelude: Noise-induced tinnitus and hearing loss in the military. *Hearing Research* 295, 3-8.
- [7] Hoare, D.J., Gander, P.E., Collins, L., Smith, S. & Hall, D.A. (2012). Management of tinnitus in English NHS Audiology Departments: an evaluation of current practice. *Journal of Evaluation in Clinical Practice* 18, 326-334.
- [8] Department of Health. (2009). Provision of services for adults with tinnitus. A good practice guide. Central Office of Information. London. Available at: [http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/documents/digitalasset/dh\\_093810.pdf](http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_093810.pdf) (last accessed 14 January 2015).
- [9] Department of Health. (2011). Operational Guidance to the NHS: Extending patient choice of Provider. Department of Health. London. Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/216137/dh\\_128462.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/216137/dh_128462.pdf) (last accessed 14 January 2015).
- [10] Tunkel, D.E., Bauer, C.A., Sun, G.H., Rosenfeld, R.M., Chandrasekhar, S.S., Cunningham, E.R. Jr., Archer, S.M., Blakley, B.W., Carter, J.M., Granieri, E.C., Henry, J.A., Hollingsworth, D., Khan, F.A., Mitchell, S., Monfared, A., Newman, C.W., Omole, F.S., Phillips, C.D., Robinson, S.K., Taw, M.B., Tyler, R.S., Waquespack, R. & Whamond, E.J. (2014). Clinical practice guideline Tinnitus. *Otolaryngology - Head and Neck Surgery* 151, S1-S40.
- [11] Gander, P.E., Hoare, D.J., Collins, L., Smith, S. & Hall, D.A. (2011). Tinnitus referral pathways within the National Health Service in England: a survey of their perceived effectiveness among audiology staff. *BMC Health Services Research* 11, 162.
- [12] Hoare, D.J. & Hall, D.A. (2010). Clinical guidelines and practice: a commentary on the complexity of tinnitus management. *Evaluation and the Health Professions* 34, 421-428.
- [13] Department of Health. (2008). IAPT implementation plan: national guidelines for regional delivery. London. Available at: <http://www.iapt.nhs.uk/silo/files/implementation-plan-national-guidelines-for-regional-delivery.pdf> (last accessed 14 January 2015).

- [14] Sereda, M., Hoare, D.J., Smith, S., Nicholson, R. & Hall, D.A. (2015). Consensus on hearing-aid fitting candidature for mild hearing loss, with and without tinnitus: Delphi review. *Ear and Hearing* 36 (4) 417-429.
- [15] Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology* 3, 77-101.
- [16] Jastreboff, P.J. & Jastreboff, M.M. (2000). Tinnitus Retraining Therapy (TRT) as a method for treatment of tinnitus and hyperacusis patients. *Journal of the American Academy of Audiology* 11, 162-177.
- [17] Lindstone, H.A. & Turoff, M. (1975). The Delphi Method. Techniques and Applications. Reading, MA: Addison-Wesley.
- [18] Shekhawat, G.S., Searchfield, G.D. & Stinear, C.M. (2013). Role of hearing aids in tinnitus intervention: a scoping review. *Journal of the American Academy of Audiology* 24, 747-762.
- [19] Hoare, D.J., Edmondson-Jones, M., Sereda, M., Akeroyd, M.A. & Hall, D. (2014). Amplification with hearing aids for patients with tinnitus and co-existing hearing loss. *Cochrane Database of Systematic Reviews* 1 CD 010151.
- [20] Landgrebe, M., Azevedo, A., Baguley, D., Bauer, C., Cacace, A., Coelho, C., Dornhoffer, J., Figueiredo, R., Flor, H., Hajak, G., van de Heyning, P., Hiller, W., Khedr, E., Kleinjung, T., Koller, M., Lainez, J.M., Londero, A., Martin, W.H., Menneneier, M., Piccirillo, J., De Ridder, D., Rupprecht, R., Searchfield, G., Vanneste, S., Zeman, F. & Langguth, B. (2012). Methodological aspects of clinical trials in tinnitus: a proposal for an international standard. *Journal of Psychosomatic Research* 73, 112-121.
- [21] Newman, C.W., Jacobson, G.P. & Spitzer, J.B. (1996). Development of the Tinnitus Handicap Inventory. *Archives of Otolaryngology, Head & Neck Surgery* 122, 143-148.
- [22] Meikle, M.B., Henry, J.A., Griest, S.E., Stewart, B.J., Abrams, H.B., McArdle, R., Myers, P.J., Newman, C.W., Sandridge, S., Turk, D.C., Folmer, R.L., Frederick, E.J., House, J.W., Jacobson, G.P., Kinney, S.E., Martin, W.H., Nagler, S.M., Reich, G.E., Searchfield, G., Sweetow, R. & Vernon, J.A. (2012). The tinnitus functional index: development of a new clinical measure for chronic, intrusive tinnitus. *Ear and Hearing* 33, 153-176.
- [23] Hiller, W. & Goebel, G. (2004). Rapid assessment of tinnitus-related psychological distress using the Mini-TQ. *International Journal of Audiology* 43, 600-604.
- [24] Zigmond, A.S. & Snaith, R.P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica* 67, 361-370.
- [25] Garin O, Ayuso-Mateos, J.L., Almansa, J., Nieto, M., Chatterji, S., Vilagut, G., Alonso, J., Cieza, A., Svetskova, O., Burger, H., Racca, V., Francescutti, C., Vieta, E., Kostanjsek, N., Raggi, A., Leonadi, M., Ferrer, M & MHADIE consortium. (2010). Validation of the World Health Organization Disability Assessment Schedule, WHODAS-2 in patients with chronic diseases. *Health and Quality of Life Outcomes* 8, 51.
- [26] Evans, C., Mellor-Clark, J., Margison, F., Barkham, M., Audin K., Connell, J. & McGrath, G. (2000). CORE: clinical outcomes in routine evaluation. *Journal of Mental Health* 9, 247-255.
- [27] Weinman, J., Petrie, K.J., Moss-Morris, R. & Horne, R. (1996). The illness perception questionnaire: a new method for assessing the cognitive representation of illness. *Psychology and Health* 11, 431-445.
- [28] Khalifa, S., Dubal, S., Veuillet, E., Perez-Diaz, F., Jouvent, R. & Collet, L. (2002). Psychometric Normalization of a Hyperacusis Questionnaire. *Journal of Oto-Rhino-Laryngology, Head and Neck Surgery* 64, 436-442.
- [29] Martinez-Devesa, P., Perera, R., Theodoulou, M. & Waddell, A. (2010). Cognitive behavioural therapy for tinnitus. *Cochrane Database of Systematic Reviews* 9 CD005233.
- [30] Baguley, D., McFerran, D. & Hall, D. (2013). Tinnitus. *The Lancet* 382, 1600-1607.
- [31] English, K. & Archbold, S. (2014). Measuring the effectiveness of an audiological counseling program. *International Journal of Audiology* 53, 115-120.
- [32] Charnock, D. (1998). DISCERN Handbook Quality criteria for consumer health information on treatment choice. Abingdon: Radcliffe Medical Press Ltd.
- [33] Fackrell, K., Hoare, D.J., Smith, S., McCormack, A. & Hall, D.A. (2012). An evaluation of the content and quality of tinnitus information on websites preferred by General Practitioners. *BMC Medical Informatics and Decision Making* 12, 70.
- [34] Henry, J.A., Frederick, M., Sell, S., Griest, S. & Abrams, H. (2015). Validation of a Novel Combination Hearing Aid and Tinnitus Therapy Device. *Ear and Hearing* 36, 42-52.
- [35] Hoare, D.J., Fackrell, K., Barry, J. & Hall, D.A. (2014). Validation of the Tinnitus Functional Index in a UK research population. Proceedings of the 8th International TRI Tinnitus Conference. Auckland, NZ, 10-13 March 2014.
- [36] Chandra, N., Lee, A. & Searchfield, G. (2014). Validation of the Tinnitus Functional Index in New Zealand. Proceedings of the 8th International TRI Tinnitus Conference. Auckland, NZ, 10-13 March 2014.
- [37] Nyenhuis, N., Golm, D. & Kröner-Herwig, B. (2013). A systematic review and meta-analysis on the efficacy of self-help interventions in tinnitus. *Cognitive Behaviour Therapy* 42, 159-169.
- [38] Hall, D.A., Mohamad, N., Firkins, L., Fenton, M. & Stockdale, D. (2013). Identifying and prioritizing unmet research questions for people with tinnitus: the James Lind Alliance Tinnitus Priority Setting Partnership. *Clinical Investigation* 3, 21-28.



## Appendix 1 Evaluation questions

- Q1-14, 34, 38-40. Details of respondent, their department and their institution, interest and involvement with the British Tinnitus Association.
- Q15. What route(s) could a patient take to be seen at your tinnitus service?
- Q16. *Via* the GP - ENT/Audiovestibular Medicine route what is the average waiting time, in weeks, for a patient to be seen by an Audiologist or Hearing therapist?
- Q17. If you accept direct referrals, what is the average waiting time, in weeks, from the referral being received to being seen at your tinnitus service?
- Q18. Which staff members are involved in the tinnitus service? Options: Head of Audiology, Senior Audiologist, Audiologist, Hearing Therapist, ENT Consultant, Audiovestibular Physician, Clinical Psychologist, Other (please give details).
- Q19/20. Have any staff members undertaken any specialist training to support tinnitus patients? Options: BTA Tinnitus Adviser Training, UCL Tinnitus Masterclass, European Tinnitus Course, Relaxation techniques, Alternative therapies, Stress management, Cognitive Behavioural Therapy, Mindfulness, Other (please give details).
- Q21/22. Is there equipment available in your department for tinnitus patients?  
Options: Ear level white noise generators, Table top sound therapy devices, Pillow speakers, Sound pillows, Other (please give details).
- Q23. Hearing Aids: Do you fit (options) Standard hearing aids, Open fit aids, Combination aids.  
If yes, please tell us which ones:
- Q24. What is your standard service for tinnitus patients? Options: Sound therapy plus education, Group educational sessions, Cognitive Behavioural Therapy, Mindfulness, Hearing therapy listening strategies, Relaxation, Written information, Other (please give details).
- Q25. Please give us any further details about services you provide for tinnitus patients.
- Q26. On average, how many patients attend your tinnitus service each week?
- Q27. Do you offer a paediatric tinnitus service?
- Q28. How do you assess the outcome of tinnitus management? Options: Tinnitus Questionnaire (TQ), MINI-TQ, Hospitals Anxiety and Depression Scale (HADS), Tinnitus Handicap Inventory questionnaire (THI), Tinnitus Functional Inventory (TFI), Self-devised questionnaire, Outcome not generally assessed, Other method (please give details).
- Q29. If a patient has bothersome tinnitus, what minimum degree of hearing loss or hearing difficulty do they need to have before you recommend hearing aids as a treatment? Options: Pure tone average worse than 20 dB in at least one ear, >35 dB hearing loss at 2 kHz, Other (please describe).
- Q30. If a patient has at least mild hearing loss and has bothersome tinnitus, under what circumstances would you recommend a unilateral hearing aid? Options: Never, if tinnitus is unilateral, Might aid the worse hearing ear.
- Q31. Has Any Qualified Provider (AQP) been introduced in your area yet?
- Q32. Please give details of any noticeable impact AQP has had on your tinnitus service:
- Q33. Is there an agreed local tariff for your tinnitus service?
- Q35. Are you currently involved with a local tinnitus support group?
- Q36. Would you be interested in getting involved with a local tinnitus support group?
- Q37. Would you be interested in setting up a local tinnitus support group?