

Hearing loss in over 18s: assessment and management

Clinical questions:

No.	Type of review	Review questions	Outcomes
1.	Clinical prediction	What are the signs and symptoms that allow early recognition of hearing loss needing immediate or urgent referral to a secondary care specialist?	<ul style="list-style-type: none"> • Malignant otitis externa, otitis media with facial nerve impairment, nasal-pharyngeal cancer, stroke, auto-immune disease) • Severe infections: otitis media with facial nerve impairment, otitis externa (malignant or necrotising) • Sudden-onset sensorineural hearing loss • Rapidly progressing cholesteatoma • Rapidly growing acoustic neuroma • Nasopharyngeal cancer and intracranial tumours • Stroke • Long-term neurological damage • Autoimmune disease
2.	Diagnostic	Who should be routinely referred to audiovestibular medicine or ear, nose and throat (ENT) surgery for medical assessment?	<ul style="list-style-type: none"> • Sensitivity • Specificity • Positive predictive value • Negative predictive value • ROC curve or area under the curve • Adjusted odds ratios
3.	Diagnostic	In people who have been referred to secondary care with sensorineural hearing loss, who needs MRI to assess the underlying cause of hearing loss?	<ul style="list-style-type: none"> • Sensitivity • Specificity • Positive predictive value • Negative predictive value • ROC curve or area under the curve Adjusted odds ratios
4.	Clinical prediction	Which groups of people are more likely than the general population to miss having a diagnosis of hearing loss?	<ul style="list-style-type: none"> • Missed diagnoses (no diagnosis prior to assessment and new diagnosis after assessment) Diagnosis rates
5.	Intervention	What is the clinical and cost effectiveness of early versus delayed management of hearing loss on patient outcomes?	<ul style="list-style-type: none"> • Hearing-specific health-related quality of life • Health-related quality of life • Listening ability • Usage of hearing aids (including data logging and self-report

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			<ul style="list-style-type: none"> • Change in cognitive function (Mini-Mental State Examination, MMSE; Modified Mini-Mental State Examination (3MS) • Social functioning/employment • Sound localisation as measured by laboratory test • Speech in noise detection as measured by laboratory tests
6.	Intervention	Review question: What is the clinical and cost effectiveness of communication needs assessment in adults with hearing loss?	<p>Critical outcomes</p> <ul style="list-style-type: none"> • Hearing-specific health-related quality of life <ul style="list-style-type: none"> ○ Hearing Handicap Inventory for the Elderly (HHIE) or HHI for Adults (HHIA) ○ Quantified Denver Scale of Communication (QDS) ○ Auditory Disability Preference – Visual Analog Scale (ADPI-VAS) ○ GHABP ○ CPHI ○ COSI ○ Device Orientated Subjective Outcome Scale ○ Any questionnaire not specified above that is relevant • Listening ability <ul style="list-style-type: none"> ○ Abbreviated Profile of Hearing Aid Benefit (APHAB) ○ Speech, Spatial and Qualities of Hearing (SSQ) ○ Glasgow Hearing Aid Benefit Profile (GHABP) residual disability subscale <p>Important outcomes</p> <ul style="list-style-type: none"> • Social functioning or employment
7.	Intervention	What is the most clinically and cost-effective way of removing ear wax?	<ul style="list-style-type: none"> • Health-related quality of life • Hearing (objective and patient reported) • Wax-related outcomes <ul style="list-style-type: none"> • amount and occlusion • ability / ease of removal • global impression of treatment efficacy (patient or clinician) • Adverse effects: perforation, infection, vertigo, bleeding, discomfort • Time to recurrence of wax
8.	Intervention	What is the most clinically and cost-effective setting for the identification and treatment of earwax?	<p>Critical</p> <ul style="list-style-type: none"> • Success of earwax removal • Improvement in hearing • Adverse events

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			<ul style="list-style-type: none"> ○ Earwax related <ul style="list-style-type: none"> - perforation - Infection - vertigo - bleeding - Discomfort ● Hearing-specific health-related quality of life <ul style="list-style-type: none"> ○ Any patient-reported scale that has been validated to provide health utility measure, for example: <ul style="list-style-type: none"> - WHO DAS II - HUI2/HUI3 - Cambridge Otology QOL Questionnaire - Speech, Spatial and Qualities of Hearing (SSQ) Scale ● Patient-reported disability or benefit ● Measures validated to demonstrate changes with audiology care in the population under study, for example: <ul style="list-style-type: none"> ○ Device Orientated Subjective Outcome Scale ○ Glasgow Hearing Aid Benefit Profile ○ Hearing Handicap Inventory for the Elderly – for elderly only
9.	Intervention	What is the most clinically and cost-effective treatment for idiopathic sudden sensorineural hearing loss (SSNHL)?	<p>Critical:</p> <ul style="list-style-type: none"> ● Pure-tone audiometry ● Speech discrimination ● Health-related quality of life ● Hearing-specific health-related quality of life <p>Important:</p> <ul style="list-style-type: none"> ● Adverse events for example, gastrointestinal bleeding, mood alteration or psychosis
10.	Intervention	What is the clinical and cost effectiveness of different routes of administration of steroids (for example oral or intratympanic) in the treatment of sudden sensorineural hearing loss (SSNHL)?	<p>Critical:</p> <ul style="list-style-type: none"> ● Pure-tone audiometry ● Speech discrimination ● Health-related quality of life ● Hearing-specific health-related quality of life <p>Important:</p> <ul style="list-style-type: none"> ● Adverse events for example, gastrointestinal bleeding, mood alteration or psychosis
11.	Qualitative	What are the information, support and advice needs of people with hearing	Any type of information, support and advice

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		difficulty and their families and carers?	<p>described by studies. For example,</p> <ul style="list-style-type: none"> • Content of information, support and advice required • How and by whom information, support and advice is delivered • Information for carers and family members as well as information for patients • Timing of information and support
12.	Intervention	What is the clinical and cost effectiveness of using patient-centred tools to help patients with hearing loss decide between different management strategies?	<p><u>Critical outcomes</u></p> <ul style="list-style-type: none"> • Hearing-specific health-related quality of life <ul style="list-style-type: none"> ○ Hearing Handicap Inventory for the Elderly (HHIE) or HHI for Adults (HHIA) ○ Quantified Denver Scale of Communication (QDS) ○ Auditory Disability Preference – Visual Analog Scale (ADPI-VAS) ○ Device Orientated Subjective Outcome Scale ○ Abbreviated Profile of Hearing Aid Benefit (APHAB) ○ Speech, Spatial and Qualities of Hearing (SSQ) ○ Glasgow Hearing Aid Benefit Profile (GHABP) residual disability subscale ○ Any questionnaire not specified above that is relevant • Adherence to chosen strategy for example usage of hearing aids (including data logging and self-report (if applicable)) <p><u>Important outcomes</u></p> <ul style="list-style-type: none"> • Any outcomes reporting: <ul style="list-style-type: none"> ○ Restricted participation/activity limitation ○ Social interactions, employment and education • Health-related quality of life <ul style="list-style-type: none"> ○ Health Utilities Index Mark 3 (HUI-3) ○ EQ-5D ○ SF-36 ○ Glasgow Benefit Inventory (GBI) ○ WHO Disability Assessment Schedule (WHODAS) ○ Self-Evaluation of Life Function (SELF) ○ HRQoL <p>Any questionnaire not specified above that is relevant</p>
13.	Intervention	What is the clinical and cost effectiveness of assistive listening	Critical:

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		<p>devices (such as loops) to support communication?</p>	<p>Hearing-specific health-related quality of life</p> <ul style="list-style-type: none"> • Hearing Handicap Inventory for the Elderly (HHIE) or HHI for Adults (HHIA) • Quantified Denver Scale of Communication (QDS) • Auditory Disability Preference – Visual Analog Scale (ADPI-VAS) • Device Orientated Subjective Outcome Scale • Any questionnaire not specified above that is relevant <p>Health-related quality of life</p> <ul style="list-style-type: none"> • Health Utilities Index Mark 3 (HUI-3) • EQ-5D • SF-36 • Glasgow Benefit Inventory (GBI) • WHO Disability Assessment Schedule (WHODAS) • Self-Evaluation of Life Function (SELF) • Any questionnaire not specified above that is relevant <p>Listening ability</p> <ul style="list-style-type: none"> • Abbreviated Profile of Hearing Aid Benefit (APHAB) • Speech, Spatial and Qualities of Hearing (SSQ) • Glasgow Hearing Aid Benefit Profile (GHABP) residual disability subscale • Speech intelligibility (BKB, HINT, QuickSIN) • Ease of listening/listening effort <p>Important:</p> <p>Any outcomes reporting:</p> <ul style="list-style-type: none"> • Restricted participation or activity limitation <p>Social interactions, employment (including voluntary work) and education</p>
14.	Intervention	<p>What is the clinical and cost effectiveness of hearing aids for mild to moderate hearing loss in adults who have been prescribed at least one hearing aid?</p>	<p><u>Critical outcomes:</u></p> <ol style="list-style-type: none"> 1. Hearing-specific health-related quality of life (key domain: participation) 2. Adverse effects: Pain <p><u>Important outcomes:</u></p> <ol style="list-style-type: none"> 3. Health-related quality of life 4. Listening ability <p>Adverse effects: Noise-induced hearing loss</p>
15.	Intervention	<p>What is the clinical and cost effectiveness of fitting 1 hearing aid</p>	<p><u>Critical outcomes:</u></p> <ul style="list-style-type: none"> • Hearing-specific health-related quality of life

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		<p>compared with fitting 2 hearing aids for people when both ears have an aidable hearing loss?</p>	<ul style="list-style-type: none"> ○ Hearing Handicap Inventory for the Elderly (HHIE) or HHI for Adults (HHIA) ○ Quantified Denver Scale of Communication (QDS) ○ Auditory Disability Preference – Visual Analog Scale (ADPI-VAS) ○ Any questionnaire not specified above that is relevant ● Health-related quality of life <ul style="list-style-type: none"> ○ Health Utilities Index Mark 3 (HUI-3) ○ EQ-5D ○ SF-36 ○ Glasgow Benefit Inventory (GBI) ○ WHO Disability Assessment Schedule (WHODAS) ○ Self-Evaluation of Life Function (SELF) ○ Any questionnaire not specified above that is relevant ● Listening ability <ul style="list-style-type: none"> ○ Abbreviated Profile of Hearing Aid Benefit (APHAB) ○ Speech, Spatial and Qualities of Hearing (SSQ) ○ Glasgow Hearing Aid Benefit Profile (GHABP) disability subscale ○ Any questionnaire not specified above that is relevant ● Device Orientated Subjective Outcome Scale ● Outcomes reported by carer or ‘communications partner’ ● Patient preference
16.	Intervention	<p>What is the clinical and cost effectiveness of directional versus omnidirectional microphones?</p>	<p>Critical:</p> <ul style="list-style-type: none"> ● Speech recognition in noise ● Ease of listening or listening effort (objective or self-reported) ● Hearing-specific health-related QoL <ul style="list-style-type: none"> ○ Hearing Handicap Inventory for the Elderly (HHIE) or HHI for Adults (HHIA) ○ Quantified Denver Scale of Communication (QDS) ○ Auditory Disability Preference – Visual Analog Scale (ADPI-VAS) ○ Device Orientated Subjective Outcome Scale ○ Any questionnaire not specified above that is relevant <p>Important:</p> <ul style="list-style-type: none"> ● Any outcomes reporting:

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			<ul style="list-style-type: none"> ○ Restricted participation or activity limitation ○ Social interactions, employment and education ○ Health-related quality of life: <ul style="list-style-type: none"> - Health Utilities Index Mark 3 (HUI-3) - EQ-5D - SF-36 ○ Glasgow Benefit Inventory (GBI) ○ WHO Disability Assessment Schedule (WHODAS) ○ Self-Evaluation of Life Function (SELF) ● Listening ability <ul style="list-style-type: none"> ○ Abbreviated Profile of Hearing Aid Benefit (APHAB) ○ Speech, Spatial and Qualities of Hearing (SSQ) ○ Glasgow Hearing Aid Benefit Profile (GHABP) disability subscale ○ Any questionnaire not specified above that is relevant ● Safety for example lack of awareness of environmental noise as an adverse effect ● Adherence
17.	Intervention	What is the clinical and cost effectiveness of noise reduction algorithms?	<p>Critical:</p> <ul style="list-style-type: none"> ● Speech recognition in noise ● Ease of listening or listening effort (objective or self-reported). <i>Note: there may not be measures to assess these but may be measured by self-report; behavioural measures of reduced processing load (for example, faster responses times when completing a listening task, or improved ability to multitask while listening; physiological measures such as lower skin conductance)</i> ● Hearing-specific health-related quality of life <ul style="list-style-type: none"> ○ Hearing Handicap Inventory for the Elderly (HHIE) or HHI for Adults (HHIA) ○ Quantified Denver Scale of Communication (QDS) ○ Auditory Disability Preference – Visual Analog Scale (ADPI-VAS) ○ Device Orientated Subjective Outcome Scale ○ Any questionnaire not specified above that is relevant <p>Important:</p> <ul style="list-style-type: none"> ● Any outcomes reporting: <ul style="list-style-type: none"> ○ Restricted participation/activity limitation

No.	Type of review	Review questions	Outcomes
			<ul style="list-style-type: none"> ○ Social interactions, employment and education ○ Listening ability Abbreviated Profile of Hearing Aid Benefit (APHAB) ○ Speech, Spatial and Qualities of Hearing (SSQ) ○ Glasgow Hearing Aid Benefit Profile (GHABP) residual disability subscale ● Health-related quality of life <ul style="list-style-type: none"> ○ Health Utilities Index Mark 3 (HUI-3) ○ EQ-5D ○ SF-36 ○ Glasgow Benefit Inventory (GBI) ○ WHO Disability Assessment Schedule (WHODAS) ○ Self-Evaluation of Life Function (SELF) ○ Any questionnaire not specified above that is relevant ● Safety (for example, lack of awareness of environmental noise as adverse effect) ● Adherence
18.	Intervention	What is the most clinically and cost-effective method of delivery of monitoring and follow-up of people with hearing-related communication needs?	<p><u>Critical outcomes</u></p> <ol style="list-style-type: none"> 1. Hearing-specific health-related quality of life <ul style="list-style-type: none"> ● Hearing Handicap Inventory for the Elderly (HHIE) or HHI for Adults (HHIA) ● Quantified Denver Scale of Communication (QDS) ● Auditory Disability Preference – Visual Analog Scale (ADPI-VAS) ● Device Orientated Subjective Outcome Scale ● Any questionnaire not specified above that is relevant 2. Health-related quality of life <ul style="list-style-type: none"> ● Health Utilities Index Mark 3 (HUI-3) ● EQ-5D ● SF-36 ● Glasgow Benefit Inventory (GBI) ● WHO Disability Assessment Schedule (WHODAS) ● Self-Evaluation of Life Function (SELF) ● HRQoL ● Any questionnaire not specified above that is relevant 3. Listening ability <ul style="list-style-type: none"> ● Abbreviated Profile of Hearing Aid Benefit

No.	Type of review	Review questions	Outcomes
			<p>(APHAB)</p> <ul style="list-style-type: none"> • Speech, Spatial and Qualities of Hearing (SSQ) • Glasgow Hearing Aid Benefit Profile (GHABP) residual disability subscale <p>4. Speech recognition in noise test</p> <p>5. Usage of hearing aids (including data logging and self-report (if applicable))</p> <p><u>Important outcomes</u></p> <p>6. Social functioning/employment</p>
19.	Intervention	When should people with hearing-related communication needs (including those with hearing aids) be monitored and followed up?	<p><u>Critical outcomes</u></p> <ol style="list-style-type: none"> 1. Hearing-specific health-related quality of life <ul style="list-style-type: none"> • Hearing Handicap Inventory for the Elderly (HHIE) or HHI for Adults (HHIA) • Quantified Denver Scale of Communication (QDS) • Auditory Disability Preference – Visual Analog Scale (ADPI-VAS) • Device Orientated Subjective Outcome Scale • Any questionnaire not specified above that is relevant 2. Health-related quality of life <ul style="list-style-type: none"> • Health Utilities Index Mark 3 (HUI-3) • EQ-5D • SF-36 • Glasgow Benefit Inventory (GBI) • WHO Disability Assessment Schedule (WHODAS) • Self-Evaluation of Life Function (SELF) • HRQoL • Any questionnaire not specified above that is relevant 3. Listening ability <ul style="list-style-type: none"> • Abbreviated Profile of Hearing Aid Benefit (APHAB) • Speech, Spatial and Qualities of Hearing (SSQ) • Glasgow Hearing Aid Benefit Profile (GHABP) residual disability subscale 4. Speech recognition in noise test 5. Usage of hearing aids (including data

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			<p>logging and self-report (if applicable)</p> <p><u>Important outcomes</u> Social functioning/employment</p>
20.	Intervention	What is the clinical and cost effectiveness of interventions to support continuing use of hearing aids?	<p><u>Critical outcomes</u></p> <ul style="list-style-type: none"> • Hearing aid use (measured as adherence or daily hours of use) • Adverse effects (inappropriate advice or clinical practice, or patient complaints) • Patient-reported outcomes including: <ul style="list-style-type: none"> ○ quality of life, ○ hearing handicap, ○ hearing aid benefit and communication • Outcomes reported by carers or relatives <p>Outcomes measured over the short (≤ 12 weeks), medium (>12 to <52 weeks) and long term (≥ 1 year).</p>