

The British Association of Teachers of the Deaf

Audiology guidelines for the assessment of children with special needs

Updated 2020



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The British Association of Teachers of the Deaf

Promoting excellence in deaf education, BATOD is the sole UK Association representing the interests of Qualified Teachers of the Deaf (QToDs) and Teachers of the Deaf. It is a voluntary, not-for-profit, organisation providing information and materials pertinent to deaf education.

BATOD publishes five Association Magazines annually, which have articles covering a focus topic, general articles and professional issues. The Journal 'Deafness and Education International' is an important benefit of BATOD membership, which provides practising Teachers of the Deaf with access to current research and information relevant to deaf education.

Strong links are maintained between BATOD and government and voluntary agencies, including Action on Hearing Loss (previously RNID) and NDCS, to contribute to policy development in this field. Teacher of the Deaf training and research are part of the supportive remit of the association's National Executive Council. BATOD is a partner in CRIDE (Consortium for Research into Deaf Education), which provides significant data about deaf education that is used in research and in negotiations regarding staffing and resources.

Regional and national meetings are organised to promote the education of deaf children and young people, through a network of eight regions and countries (BATOD: East, Midland, North, South, South West, Northern Ireland, Scotland and Cymru). Details of these, and courses relevant to CPD, are notified on the BATOD website calendar (www.batod.org.uk) and are open to non-members.

Additional information about the association and matters relating to the education of deaf children and their teachers is available on the BATOD website www.batod.org.uk

The term 'deaf' is used to cover the whole range of hearing loss.

This document is an updated version of the
Guidelines for Hearing Assessment of Children with Complex Needs
originally written by Margaret Glasgow, Cert ToD, MSc Aud
Education Audiologist (1997),
which was revised in July 2011 by
Elizabeth Reed-Beadle, Frances Henderson, Jo Allen, Jo Franklin.

The original appendixes have been retained as that content is still relevant.

Graphic design by Rosi Hearnshaw

Abbreviations used in this document

ABR	Auditory Brainstem Response
ASD	Autistic Spectrum Disorder
BAHA	Bone Anchored Hearing Aid
BOA	Behavioural Observation Assessment
CI	Cochlear Implant
CPD	Continuing Professional Development
CRIDE	Consortium for Research in Deaf Education
dB	Decibel
Hz	Hertz
KHz	Kilohertz
LSW	Learning Support Worker
MSI	Multi-Sensory Impairment
NDCS	National Deaf Children's Society
PMLD	Profound and Multiple Learning Difficulties
SLD	Severe Learning Difficulties
SLM	Sound Level Meter
SNHL	Sensori-Neural Hearing Loss
QToD	Qualified Teacher of the Deaf
VRA	Visual Reinforcement Audiometry

Currently, if a child has been diagnosed with an illness, disability or sensory impairment and requires a lot of additional support on a daily basis, they are described as having "complex needs" (NHS 2018¹). For example, children with 'profound and multiple learning disabilities' (PMLD):

- have more than one disability
- have a profound learning disability
- have great difficulty communicating
- need high levels of support with most aspects of daily life

- may have additional sensory or physical disabilities, complex health needs
- may have mental health difficulties, or
- may have behaviours that challenge us.

For more detail, read the full PMLD Network definition of profound and multiple learning disabilities.

Source: <http://www.mencap.org.uk/all-about-learning-disability/about-learning-disability/profound-and-multiple-learning-disabilities-pmld>

¹ www.nhs.uk/conditions/social-care-and-support-guide/caring-for-children-and-young-people/how-to-care-for-children-with-complex-needs

Introduction

This updated document considers the challenges in providing advice about audiological assessment for some of the most complex children.

In producing this update, BATOD suggests ways of improving the audiological services offered to children with special and complex needs. BATOD is committed to ensuring that all deaf children receive a timely and accurate diagnosis, are referred to audiology clinics for hearing assessments, and receive high quality audiological care and management. Sensitive child-centred assessments can only take place within the framework of a team assessment where all the experts work together: parents, Teachers of the Deaf, Educational Audiologists, Clinical Audiologists and other professionals who routinely work with the child. By building a profile of a child's auditory behaviour across a range of settings, it is possible to ensure that information gained has the best chance of being directly relevant to the child. Idiosyncratic response patterns can be interpreted more meaningfully and objective tests can be placed within the context of an individual child if all those concerned understand response patterns and preferences.

It is important for all Qualified Teachers of the Deaf to understand that labels can mislead. A mild hearing loss may have more than simply mild implications for a child who is non-ambulant and has severe learning difficulties. A moderate loss may have much more of a cumulative effect when it occurs with a moderate learning disability. A unilateral loss will have major implications for a child in a side-lyer (recumbent chair, Figure 1). The multiplying effect of hearing loss in the context of complex needs challenges all those involved in audiological management.

Fig. 1. Example 'Side Lyer' options



There is recent evidence that some children with complex needs receive less than optimum audiological, social or educational support. The importance of providing a high level of service is exemplified in this document.

For children with special needs the challenges of obtaining audiological information and ensuring that appropriate hearing aids are fitted, and that the fitting is verified, are considerable. It is equally important to ensure that such children have a relevant soundscape and the opportunity to experience a relevant sound experience, regardless of whether they will acquire spoken language or not.

It is well known that children with complex needs and those with sensory processing difficulties can require a number of appointments to establish conclusive hearing test results in a traditional audiology test environment (Rafferty et al., 2013; Quick et al., 2020)². To try and streamline the assessment process and reduce the number of appointments and parental anxieties it is crucial that additional steps are taken.

It is likely, in the case of children with special needs, that an audiological picture is built up over a number of assessments. It is through using a battery of tests and ensuring results are supported by parents and professionals that accurate assessments can be made. The audiological information is essential to (re)habilitation or listening programmes delivered by education professionals.

2 Rafferty A, Martin J, Strachan D & Raine C (2013). *Cochlear implantation in children with complex needs – outcomes*. *Cochlear Implants Int*, 14(2), 61-66. <https://doi.org/10.1179/1754762810Y.0000000009>

Quick N, Roush J, Erickson K & Mundy M (2020). *A Hearing Screening Pilot Study With Students With Significant Cognitive Disabilities*. *Lang Speech Hear Serv Sch*, 51(2), 494-503. https://doi.org/10.1044/2019_LSHSS-19-00017

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Audiology guidelines for the assessment of children with special needs 2020

1 Aim of hearing assessment

To establish whether a child who has any combination of physical, sensory, learning or behavioural disabilities also has a significant hearing loss through:

- reviewing audiological information obtained by objective and behavioural testing
- obtaining information on hearing status and functional hearing levels to enable the appropriate provision of suitable interventions
- adding to the development of an ongoing picture of a child's hearing or to check for any changes.

Consideration must also be given to how to share this information and any recommendations arising from it.

Important factors to consider are:

- Deafness may not be the major problem and may not be perceived to be an important factor by family or other professionals when considered alongside the child's other needs.
- Deafness may not be significant or, conversely, it may be a vital defining factor in the child's presentation.
- Deafness may not be present.

2 Pre-test information and observation

2.1 Gathering of information

With consent, use preliminary questionnaires to gather relevant information.

It is helpful to provide an appointment letter to parents with an explanation of what to expect in the clinic. Alongside their appointment letter, a social story may be helpful to enable parents or carers to begin to prepare the child for the appointment. For example, a social story supported by pictures of the department helps the child to begin to familiarise themselves with where they will be going and what will be happening.

It is important to bring together observations from parents, carers and anyone who knows the child and their communication style well, including:

- the extended family
- the education service, including the child's pre-school or school staff
- specialist teachers including those from the sensory support service and services such as ASD
- the health service, including gathering any previous audiological assessments
- children's social services.

2.2 Visiting before the test

It is often helpful if the tester can visit the child before the test in order to:

- observe the child in a familiar environment
- talk with parents, the class teacher, assistants etc about how the child reacts to sound
- note and measure levels and types of responses to environmental sounds, favourite activities, events and toys.

2.3 Consider the following

Establish how the child reacts to strangers.

- Establish the child's level of receptive language. For example, is the child working at a pre-verbal or verbal level? Does the child know/respond to their own name? Is the child working at a two-word level or do they have a greater level of understanding?
- Similarly, establish the level and form of expressive language.
- Consider any involuntary actions or repetitive behaviours that are not triggered by sound, for example, intermittent kicking, turning of head to one side etc.

- Record any physical disabilities that could prevent the child from responding behaviourally to sound.
- Find out the time of day when the child is most responsive so that the test can be arranged at that time if possible, as changes to routines can often be upsetting.
- If the child is taking medication, find out if there are any side-effects.
- Establish the normal physical presentation for the child.
- Investigate the child's vision awareness, as a darkened room may be preferable for testing.
- Find out who would be best to accompany the child to the test situation, for example, parent/carer, classroom assistant, QToD.
- Ask about mood swings and times they may occur.
- Decide which test would be appropriate according to the child's developmental level in order not to waste time and tire the child. It is most likely that the appropriate test will not match the child's chronological age.

If it is not possible for the tester to visit the school beforehand, it may be possible to arrange for another QToD to gather some information. The tester would then need to have time to observe the child before testing and to talk to the accompanying adult.

3 Examples of environmental sounds and reactions

3.1 Indoor environmental sounds

- banging: doors, noisy toys, furniture moving
- people: voices, singing, whistling
- appliances: toilet flushing, washing machine, music and television being switched on

3.2 Outdoor environmental sounds

- planes; traffic; animal sounds
- shop sounds; footsteps; voices and shouting etc.

3.3 Reactions to sounds

Note the type of response to sound such as voicing, pointing, signing etc. For example:

- Body movement: stilling; rocking; cessation of rocking, body wriggling, banging with hands, kicking; cessation of kicking, twitching of limbs; turning head/body/eyes to locate sound, moving away from sound source.
- Eyes: eye widening; blinking; eye flicks.
- Vocalisation: crying; shouting; singing; cessation of crying; cessation of vocalisation.
- Breathing: change in breathing; holding breath.
- Facial: frowning; voicing, smiling; laughing, cessation of mouthing, dribbling; momentary cessation of dribbling, grimacing; startling, sucking/stopping sucking, teeth grinding/stopping teeth grinding.
- any other change in behaviour which the child consistently makes to stimuli and that is repeatable and specific.

4 Test modifications

The test may need to be modified in order to ascertain the child's hearing levels. However, it is important that flexibility in applying the principle of the test does not result in any reduction of rigour. In most situations it will be necessary to have two experienced practitioners: an enabler who can observe a positive response and an experienced tester who can apply each test. Where consent can be obtained, it is recommended that testing is videoed for verification purposes.

Test modification may include the following:

- Longer presentation of stimuli.
- Larger gaps between presentation intensities and plenty of no-sound trials.
- Extended conditioning and encouragement.
- Video sessions and review with 'naïve' observers.
- Frequent encouragement to the child.
- Reward system – such as a hand massage 'before and after'.
- Allow time for processing and accept 'good' and 'bad' days.
- Pink noise, narrow band noise, live voice, LING sounds and music, rather than tonal stimuli, may need to be used³.

At times, despite having custom reinforcers, the child demonstrates little interest in conventional test stimuli such as warble or pure tones.

Tailored Visual Reinforcement Audiometry:

- Use of images and sound files based on the child's interests as identified in the pre-assessment questionnaire.
- If possible use of band-pass filtering of familiar music for conditioning.

³ Sanders JW & Josey AF (1970). *Narrow-band noise audiometry for hard-to-test patients*. J Speech Hear Res, 13(1), 74-81.
<https://doi.org/10.1044/jshr.1301.74>

4.1 The testing environment

Tests undertaken in a familiar environment can establish whether or not the child has any significant hearing loss that could exacerbate any speech and language delay. The child is usually more relaxed in a familiar environment. The room used needs to be visually and acoustically quiet, at a comfortable temperature, and a size that is suitable to complete the test.



Child with cerebral palsy and MSI (hearing aid user) and familiar Learning Support Worker (Occupier). The Educational Audiologist is using sound field audiometry with a calibrated handheld audiometer. The Occupier is working within the visual field and observing brief eye-pointing in response to stimuli.

4.2 The Occupier in a distraction test

The Occupier

- should be positioned in order to be seen clearly by the child. If instructions are signed, this will need to be in the visual field if the child has a visual impairment
- needs to be sensitive to the child's needs. For example, the child may be more attentive to voice or touch than small objects, when occupying etc. Think about touch: for some children this may be counterproductive as it may alter their physical state, for others it may be intrusive. For some, even a gentle touch may be very disturbing and a positive touch may be more acceptable

- may need to demonstrate the test sound in front of the child and then let the tester continue behind
- may not need to occupy but simply observe the child's responses
- needs to be very observant of the child's change of behaviour when a stimulus is presented and decide whether or not it is a reliable response to sound
- needs to be aware of alternative responses, for example, rocking, stilling, voicing etc
- needs to be aware that a child may reach out
- needs to be aware that a blind child is unlikely to turn to sounds (see 5.4 for further discussion)
- needs to be aware that children with complex needs may not be consistent; they may only respond when they become annoyed with the stimulus or when there is a window of attention to external stimuli
- when presenting a visual test, consider using a symbol set the child is familiar with.

4.3 The Tester in a distraction test

The Tester

- may need to give the stimuli for much longer than usual to allow for processing delays. Gaps between presentations may also need to be longer;
- may need to use non-frequency specific stimuli in order to get a response – familiar sound-making toys etc. These can often be used at minimal levels. It must be noted that they give information across the frequencies and do not give information about specific frequencies;
- should be aware that certain stimuli may trigger discomfort;
- should use a sound level meter (SLM) to measure sounds accurately.

Examples of non-frequency-specific sounds that could elicit a response include sweet paper; crisp bag; football rattle; cup and spoon; clink of bottles etc; musical toy (ask about any favourites at the pre-assessment information-gathering stage).

4.4 Cooperative test (where the child is asked to hand an object to another person)

- Establish that the child knows the names of objects/people that are being used.
- Consider the physical properties of the toy: the child may not be able to grip a small brick or may have problems releasing it.
- The response may vary. Responses may include eye-gazing in the direction of the object or person, stilling, holding breath, or any other behaviour that is consistent with the presentation of sound.

- The tester may not be able to cover his/her face to prevent lip-reading except with his/her hand as the child may become insecure.

4.5 Performance test (where the child responds to specific sounds)

4.5.1 Ways of conditioning to sound:

- in a tactile way
- with light, for example, shining a torch onto a surface
- through vibrotactile stimulus on the wrist or mastoid
- any combination with sound.

4.5.2 Stimulus may be:

- voice, for example, 'go' and 'ss'
- wideband noise
- narrowband noise
- warble tones
- non-frequency specific sounds of interest, such as a musical instrument or crisp packet
- frequency specific sounds, such as a high frequency rattle
- a sound source, eg a warbler, which can be used to present a range of sound stimuli. Please note that Meg no longer produce the warbler that will exist among some audiology resources
- hand-held audiometer (eg Kamplex or Interacoustics)
- clinical audiometer via insert phones or the child's own ear moulds.



Child locating the warble tone generator by audition alone

4.5.3 Waiting posture (whilst awaiting the sound presentation):

- tester holding an object near the ear
- tester holding an object near the audiometer
- tester holding a teddy with a brick or peg etc.

4.5.4 Response may be:

- putting the person in a boat (previously referred to as 'man-in-a-boat')
- dropping a brick in the box or a bucket. The size of brick and bucket can be varied to suit the physical needs of individual children. Using a tubular biscuit tin, which creates tactile and auditory feedback as a brick slides down may help children with a vision impairment)
- inserting a large peg into a hole
- giving an object to the parent/carer
- knocking a brick or similar toy to the ground with their hand
- kicking a toy away
- any quiet turn-taking game, such as 'Pop-up Pirate'
- any movement the child makes consistently in response to stimuli
- provided using an upturned drum on the child's lap. This can also give a really good vibrotactile reinforcement for a blind child.

The response chosen should relate to the child's familiar response repertoire.



Child and Occupier. The Educational Audiologist is using sound field audiometry with a calibrated sound source. The child is in her own chair and classroom. The Occupier is watching for responses and, as this is the third session (same set-up, same staff), everyone is becoming more familiar with the routines and expectations.

4.5.5 Reward may also be:

- vocal
- a smile
- a clap
- a jump toy which goes up and down
- an appropriate physical reward, such as a 'high-five'.

4.6 McCormick Toy Test

- The child should be positioned according to their postural needs, thereby maximising their ability to access the objects. Only use toys, in pairs, that are known to the child.
- Make sure toys are within easy pointing, eye-gaze or giving range.
- The tester may need to present a very limited number of objects and may need to present on a dark background.
- Be aware of the impact of 'contrast sensitivity' for children with vision impairments.

4.7 Pure-tone audiometry

Find the most suitable means of response during conditioning.

In addition the response to this test could be:

- voicing
- rocking
- kicking
- plus any of those listed in section 3.3.

The tester must be completely sure that the response is reliable and repeatable.
See section 3 – Tailored Visual Reinforcement Audiometry.

5 Points to consider when testing

5.1 Acquiring the most helpful information

It is important to liaise with other professionals and parents/carers before assessing any child with complex needs. Refer to the data collected previously regarding the individual complex needs of the child (health, audiology, education etc).

- Consider any information on ABR, cochlear microphonic or otoacoustic emissions.
- Decide beforehand what you need to know and how best to find out.
- When carrying out a pure tone audiogram, test the most useful responses first in case the child tires easily, eg 1kHz and 4kHz in each ear, then 500Hz and 2kHz. Consider whether to test the better ear first. This may help condition the child but can lead to him/her giving a less reliable response as they get tired later on.
- It may be necessary to conduct the test over a number of appointments.
- The false positive rate may be much higher than with other children. A lot of patience and encouragement is required.
- Some children have a fluctuating hearing loss. Consider the causes of the hearing loss before advising interventions.
- It is advisable to video the child, with permission, during testing. This can provide additional assurances as to what constitutes a response for the individual child.
- Keep the number of people in the test room to a minimum.
- Tympanometry and stapedial reflex measurements can provide useful information.

If a paediatric audiology clinic can provide information from electrophysiological tests of hearing (newborn hearing screening tests) this can be helpful.



Child and class QToD in a familiar environment. The Educational Audiologist is conducting audiometry in the school's acoustically treated room

5.2 Levels of stimuli

Stimuli for all tests may need to be given at levels higher than screening levels to elicit a response. This may be related to the interest level of the child and not necessarily the threshold of detectability.

To distinguish between levels of interest and detectability means to consider observations made by parents and staff as well as the results of other assessments to give a more complete picture of hearing function.

- Stimuli may need to be given for a longer period as the child may need a longer time to respond.
- A time lapse of 15–20 seconds after normal stimulus presentation may be needed to give the child time to respond.
- The child may 'still' to quieter sounds (detectability) and 'locate' louder sounds (interest).
- The child may be responsive to high-frequency sounds, which are more alarming, than low frequency sounds, which are more soothing.
- The child may become unsettled when lipreading is denied during testing. Strategies to overcome this may include:
 - the tester covering their mouth with their hand rather than a screen
 - directing the child's gaze away from the tester's face, for example, towards a toy or another person
 - standing behind the child and directing the child's gaze forward.

Be aware that sound in conjunction with other sensory stimuli can be very overwhelming and cause sensory overload.

- Provide structured listening sessions to elicit a response and try to make sound meaningful.
- Consider starting with simple engagement such as intensive interaction.
- Start with sound 'detection' (Erber 1982) focusing on 'start' and 'stop' or 'on' and 'off'.⁴
- Provide a safe listening environment free from other stimuli and sensory 'clutter'.
- Involve the patient/child in the care of their hearing aids.
- Include specific interventions recommended by speech and language therapy.
- Consider the use of music to transfer structured listening into real-life situations and improve auditory memory especially for those children whose exposure to sound and listening has been very limited.

⁴ Footnote: Erber, N. (1982). Auditory Training. Washington DC: Alexander Graham Bell Association for the Deaf & Hard-of-Hearing.

5.3 Consideration for children with vision impairment

Vision-impaired children may not have experience of visual reinforcement when they turn to sound and therefore do not always respond with a turn, although they may be physically able.

When testing children with a vision impairment, find out from those who know the child well what the best lighting conditions will be for the assessment. Be aware of the impact of 'contrast sensitivity' for children with vision impairments. Some children find that glare and reflected light can be painful.

5.4 Consideration for children with autistic spectrum disorder

Like other children with complex needs, children and young people with autistic spectrum disorder can find it very difficult to extract meaning from sound and speech and filter out dominant visual information. They may be unable to process visual and auditory stimuli at the same time

For those students with a hearing loss and autism, sounds are transient stimuli and can be meaningless unless the students are taught and helped to explore and understand sounds. The nature of hearing is temporal: sound comes and then is gone.

5.5 Position of the child for all tests

It is important that the child is comfortable so that effort is focused on listening and not on supporting themselves. Consult the child's physiotherapist, if appropriate.

The best position may be:

- sitting on an ordinary chair at suitable height so that the child is comfortable



Child in his own classroom and the Educational Audiologist using the McCormick Toy Test and a type 2 sound level meter. The session is being filmed.

- sitting on someone's lap (It is important that this person does not react /give any clues when the stimuli are presented)
- sitting in their own wheelchair
- sitting on the floor
- sitting in their own specialist chair
- lying on the bed or floor
- standing with help of a standing frame or support.

5.6 Post assessment

Evaluate the session and involve clinical staff and parents to establish a plan for the next sessions.

- Contribute to developing a listening programme for the child to be delivered by parents/educational staff.
- State improvements and/or adjustments to the follow-up session.
- Continue to plan to make the audiological assessment a positive experience for the child and their parents or carers. Many are used to their child being very un-cooperative and obtaining no information at appointments. Having their child co-operative, even in part, contributes to a positive experience.
- experience can be positive from the child's perspective.

5.7 Summary

Gather and use information about the child to support the hearing assessment. Be aware that some children do not like to be touched and a familiar adult may need to support the correct placement of audiological equipment such as inserting earphones, headphones, or a bone conduction transducer.

Use a multiple-test protocol which increases the reliability and validity relative to a single test.

In order to get the most out of every child, it is important to consider the needs of each child in their entirety, from their journey into the hearing assessment right up until they make their way home.

Don't under-estimate the importance of good advance planning!

6 Suggestions for further reading / bibliography

McCracken, W & Laoide-Kemp, S (Eds) (1997 March) **Audiology in Education**, London: Whurr

McCracken, W (1994 March) **Deaf Children with Complex Needs: A Piece in the Puzzle** *Journal of British Association of Teachers of the Deaf* Vol.18, No 2, Page 54

Walker, V (1986) **Assessing Auditory Function** *Talking sense* 32,4 Page 6
Looks at assessment based on the first three of Gleason's levels

Auditory Assessment of the Visually Impaired Pre-schooler: A Team Effort

Education of Visually Handicapped 16, 3 Pages 102 - 113

A useful article as it shows levels of auditory response which provide a good basis for assessment.

Murdoch, H (1994 and 2009) **He Can Hear When He Wants To!**

Assessment of Hearing Function for People with Learning Difficulties

British Journal of Learning Disabilities Volume 22, Issue 3, pages 85–89, September 1994

also published online since 26 AUG 2009 DOI: [10.1111/j.1468-3156.1994.tb00123.x](https://doi.org/10.1111/j.1468-3156.1994.tb00123.x)

Suggestions for supporting auditory development in visually impaired children

Van Dijk, J Jansen, M and Nelson, C (1997)

The child who is deafblind from a diagnostic pedagogic perspective

Article reproduced on Child-guided Strategies for Assessing Children who are deafblind or have Multiple Disabilities, CD Rom 2002, Van Dijk and Nelson. Insituut voor Doven

Yeates, S (2000)

Audiological Assessment of People with Special Difficulties

In Mental Health and Deafness Hindley, P. and Kitson, N. (eds). London: Whurr

Wendy McCracken and Bridget Pettitt (2011 February)

Complex Needs, Complex Challenges National Deaf Children's Society

A report on research into the experiences of families with deaf children with additional complex needs. <http://www.ndcs.org.uk/document.rm?id=5643>

Appendices

These include some examples of leaflets from the Surrey Sensory Support Service as an example of practice.

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Appendix A

Behavioural definitions of response (1) (Kershman & Napier 1982)

The presence or absence of a response to auditory stimulus is recorded up to 10 seconds after the stimulus has ceased.

A response is considered to be any change in the pre-stimulus state of behaviour.

When 2 or more responses are observed, all are recorded.

The INTENSITY (or strength) of response is recorded using the following code:

0	No Response	Child does not appear to perceive stimulus Remains in pre-stimulus state
1	Low Response	Child responds with minimal activity for only a brief moment Presence of response may have been difficult to determine
2	Medium Response	Child exhibits an obvious response, but with only moderate interest. Reacts then reverts back to pre-stimulus state
3	High Response	Child exhibits an intense response and is completely occupied by response to the stimulus

Behavioural definitions of response (2) (Kershman & Napier 1982)

Definitions for recording	CHILD BEHAVIOURS
No response	
Cessation of activity	
Quieting	- child discontinues vocalisations
Increased activity	- any motion of child's body parts that is initiated
Jerk/Startle (Extension)	- child shows sudden involuntary movement with limbs extending outwards.
Jerk/Startle (Inflexion)	- sudden involuntary movement with limbs drawing inward.
Crying	
Laughing	
Smiling	
Eye blinking	
Eye widening	
Eye localisation	
Head turning (localisation)	
Body localisation	
Reaching	

Appendix B Functional hearing assessment check sheet

Use this quick check sheet of initial questions to identify key points about the child's hearing.

Functional Hearing Assessment for:

Audiological assessment results

Seen at:

by:

Hospital Number

Implications:

Amplification or additional aids

What sounds interest this child?

Do they like sound-making toys?

Do they like music?

Sudden noises?

Familiar or unusual noises?

Their name?

What are the reactions to these sounds?

Is the reaction when the sound stops?

Is it often a delayed reaction?

Repeatable?

Concentration span? / Easily distracted from the sound?

Is there a "best listening" time / place / people?

Are reactions to speech, "within normal speech levels"?

Distance from sounds?

Do familiar voices have an effect on moods etc?

Stranger's voices?

Is there a preference for male or female voices?

Can the mood of the speaker be picked up?

Is a vibro-tactile element important?

More alert to one side or the other?

Are sound-makers held up to one side or the other?

Are any activities anticipated by sound alone?

Jo Franklin Wandsworth Sensory Support Service

Appendix C Levels of auditory skill development

Gleason (1984) identified 6 levels of response:

- awareness
- attention
- localising
- discrimination
- recognition
- comprehension

Awareness	Unintentional, reflexive responses (eg startle reflex, blinking reflex, etc)
Attention	Intentional responses (eg stilling, increasing or decreasing vocalisations etc.). Beginning to show some differentiation of something happening around him/her. Responses may be fleeting and inconsistent.
Localising	Child is able to localise a sound. Becomes more consistent in responses made.
Discriminating	Knowing whether two sounds are the same or different.
Recognition	The sound and its meaning have been remembered. Identifies auditory features of a sound.
Comprehension	Not only recognising sounds, but also relating meaning to what is currently happening.

Gleason, D. (1984) '**Auditory assessment of visually impaired preschoolers: A team effort**'
Education of the visually handicapped 16(3): 102-13.

Appendix D The screening of hearing for children in specialist provision

Introduction

This procedure is designed for children with profound learning/physical difficulties, who cannot respond conventionally to distraction techniques.

Ideally the children would be observed by an Advisory Teacher of the Deaf in their familiar situation, eg classroom

Record observations

Request observations from staff, based on the enclosed guidelines

Advisory Teacher of the Deaf to explain and hand observation record sheet to staff two weeks before educational audiologist's visit.

It is very important to have 'no sound trials' and observe random movement, etc that can be mistaken for responses.

Response to sound

Observation of child with severe learning difficulties

Examples of sounds

- 1 Indoor environmental sounds (eg banging doors, music and television being switched on, noisy toys, furniture moving, sounds during food preparation, dinner trolley coming).
- 2 External environmental sounds (planes, traffic, animal sounds).
- 3 People's voices (singing, whistling and familiar person's voice as they enter the room).

Examples of reactions to sounds

cessation of activity
cessation of crying
change in breathing
crying at sudden noise
rocking
banging
interest in sound source
eye widening or blinking
attempts imitation of sound

hits objects and derives pleasure from sounds
vocalisation
facial grimace
stops vocalising
changes vocalisation
startling
joins in singing
reaction to sound stopping

Examples of communication (child's own voice):

any vocalisations
shouts, squeals
babbling
laughs when pleased
cries when distressed

derives pleasure from use of own voice
tuneful/guttural sounds
imitates sounds
vocalises to attract attention

WARNING!

Be aware that the child may be responding to clues, such as:

Tactile

vibrations
tap/touch

Olfactory

perfume
dinner smells

Visual

pointing (eyes)
signs, gestures

Observations on child's general behaviour

- voluntary movements (range, symmetry)
- involuntary, random behaviours
- observe behaviour when wakeful but unstimulated

Appendix E Recording response to sound (child with PMLD/ASD/SLD)

Date	Sounds/Situation	Responses
Autumn term Exemplar 1	Indoor environmental sounds, eg banging door Familiar voices Musical instruments High pitched tin whistle Very loud bang on tambourine Communication	No reaction No assessable response Apparently no response Stopped vocalising - left and right However, became unresponsive to sound after four trials Opened eyes a) enjoys making open vowel sounds usually when lying on side b) cries when distressed c) laughs but usually for no apparent reason, and can alternate with crying
Exemplar 1 observations Autumn term Generally it is felt that the child has a limited basic response to sound which is not consistent.		
Spring Term Exemplar 2	Banging classroom door (repeatedly) Singing Incy Wincy Spider Putting classical music tape on Colin spinning bells - very loud Singing 'Good Morning' (child's name) Spinning bells Singing 'Good Morning' (child's name) Putting classical music tape on Singing Incy Wincy Spider Classical music tape	Smiling. Wide eyed. Head on one side. Stopped crying Jumped up and down, flapping his hands. Child came close and watched intently but put his hand over both ears. Stopped crying Stopped crying Stopped crying Stopped crying Stopped screaming and kicking Calmed down a little from having a tantrum
Exemplar 2 observations Spring term Autism causes to inhibit on occasions. Loves singing and listens intently. 'Incy Wincy Spider' and 'Round and round the garden' are his favourites. During the latter humming along tunelessly and appropriately, stopping when anticipating tickling at end. With sound making toys creates sound and experiments with stopping/ starting at source. Also responding to quieter 'squeaky' toys. Turned when name spoken in conversation. If in good mood will co-operate nicely for distraction, but does frequently choose not to respond.		

Appendix F **Recording response to sound** (child with PMLD/ASD/SLD)

Date	Sounds / Situation	Responses

Appendix G Speech discrimination tests

Kendall Toy Test

Distractors: mouse, book, string, glove, plane

Toy	Named as	Toy	Named as
house		cow	
spoon		shoe	
fish		brick	
duck		cup	
gate		plate	
SCORE:at dBA + / - lipreading		SCORE:at dBA + / - lipreading	

Manchester Picture Test*/Junior*/Short Word Lists/Other

Score at dBA + / - lipreading

Examples of Expressive/Receptive Language

Examination of ears

Tympanometry

Summary

Recommendation

Signed Date
Educational Audiologist

Copies to:

Appendix H UCSF Audiological Assessment

Source: http://www.ucsfbenioffchildrens.org/education/hearing_tests_for_children/index.html

UCSF Benioff Children's Hospital, San Francisco

Hearing Tests for Children

UCSF audiologists collaborate with specialists from many different fields to evaluate children. The professionals we work with may include:

- Pediatricians
- Otolaryngologists, or ear, nose and throat specialists
- Speech pathologists
- Educators
- Behavioural specialists
- Occupational and physical therapists
- Ophthalmologist

And, most importantly, we work extensively with parents.

No child is too young for a hearing test. Infants are routinely screened for potential hearing loss after birth before they leave the hospital. The type of test used to assess a child's hearing status depends on the age and cognitive function of the child.

Hearing Tests for Infants

Infants are tested in two ways:

1) Behavioural Observation Assessment (BOA)

These tests are conducted by a specially trained audiologist who observes a child's body and head responses to sounds, including cessation of activity, body movement, eye widening, eye opening, or change in sucking rate.

2) Electrophysiological Tests

These tests help determine a child's hearing levels based on electrical information from the auditory nervous system. Usually waves are noted on a screen and compared to norms. They are used when behavioral tests do not provide a complete picture of a child's hearing.

3) Visual Reinforcement Audiometry (VRA)

As children mature, so does their ability to respond to sounds. At about 6 to 7 months, normally developing children can turn toward a sound source. Children at this level are tested either with earphones or in a sound booth with speakers. Sounds for testing typically include low pitch to high pitch tones from the speech range. Turning toward the sound source is reinforced with a lighted toy. This testing is generally quite accurate in determining hearing levels.

Appendix I Auditory Skills Checklist

Child's Name

Birth Date:

Person Reviewing Skills:

Dates Auditory Skills Reviewed:

Directions: Skills should be checked-off only if the child responds or has responded using auditory-only clues, without any visual information available. Although these skills are listed in a relatively typical order of development, it is common for children to increase in the depth of their development in previously acquired skills while learning skills at more advanced levels. Work on skills from one or two levels at a time. A child's rate of progression can depend on cognitive ability, the ability to attend for periods of time, vocabulary size, ability to point, etcetera. Every time you monitor auditory skill development, check off changes in the child's ability to respond or perform each skill that is being worked on. Estimates of percent of the time the child is seen to respond are approximations only based on the observation of the parents and others who regularly interact with the child. In subsequent reviews of the child's auditory skill development check off progress made (e.g. add check to E column if child is seen to begin to respond or demonstrate skill).

NOT PRESENT (0-10%) E = EMERGING (11 – 35%) I = INCONSISTENT (36-79%) A = ACQUIRED (80-100%)

E	I	A	AUDITORY SKILL	EXAMPLE	APPROX DATE ACQUIRED
			LEVEL ONE		
			Child wears hearing aids or implant all waking hours	Hearing aids worn at all times except for naps and bathing.	
			Awareness to sound: Child nonverbally or verbally indicates the presence or absence of sound.	Child's eyes widen when she hears her mother's voice.	
			Attention to sound: Child listens to what he hears for at least a few seconds or longer.	Child pauses to listen to father's voice.	
			Searching for the source of sound: Child looks around, but does not necessarily find sound source.	Child glances or moves in search of the sound.	
			Auditory localization: Child turns to the source of sound.	Child turns to Mom when she calls her.	
			LEVEL TWO		
			Auditory feedback: Child uses what he hears of his own voice to modify his speech, so that it more closely matches a speech model.	Parent says ee-oh-ee and child imitates. Parent says woof-woof and child imitates	
			Auditory discrimination of nonlinguistic sounds and suprasegmental aspects of speech: Child perceives differences between sounds or sound qualities, such as loudness, long/short, pitch.	Child indicates which toys from 2 available made a loud sound;	
			Distance hearing: Child responds at increasing distances from the source of the sound.	Mother calls child from another room, and she hears her.	
			Auditory association of environmental, animal or vehicle sounds, and/or familiar person's voices.	Child identifies dog barking, points to the dog. Child hears Dad's car and smiles because she knows Dad is now home.	

Appendix J Routes for learning

These materials support schools in assessing the early communication and cognitive skills of learners with profound learning difficulties and additional disabilities. They meet the very individual needs of these learners by showing a range of possible learning pathways.

The use of the materials is intended to not only support teachers in assessing learners' current performance but also help them to discover what has shaped that performance. The assessment materials support a wider view of progress for these learners.

These materials are designed to be used across the curriculum with learners of all ages. They will support the development of 'child considered' approaches and the focus on emotional well-being in the Foundation Stage. At Key Stages 2 and 3, the materials will be part of a national curriculum and framework for assessment, which will include learners of all abilities.

The materials can be used to assess the learning of young people (aged 14–19) with complex needs across all learning pathways, which will provide an appropriate context for the development of these early skills.

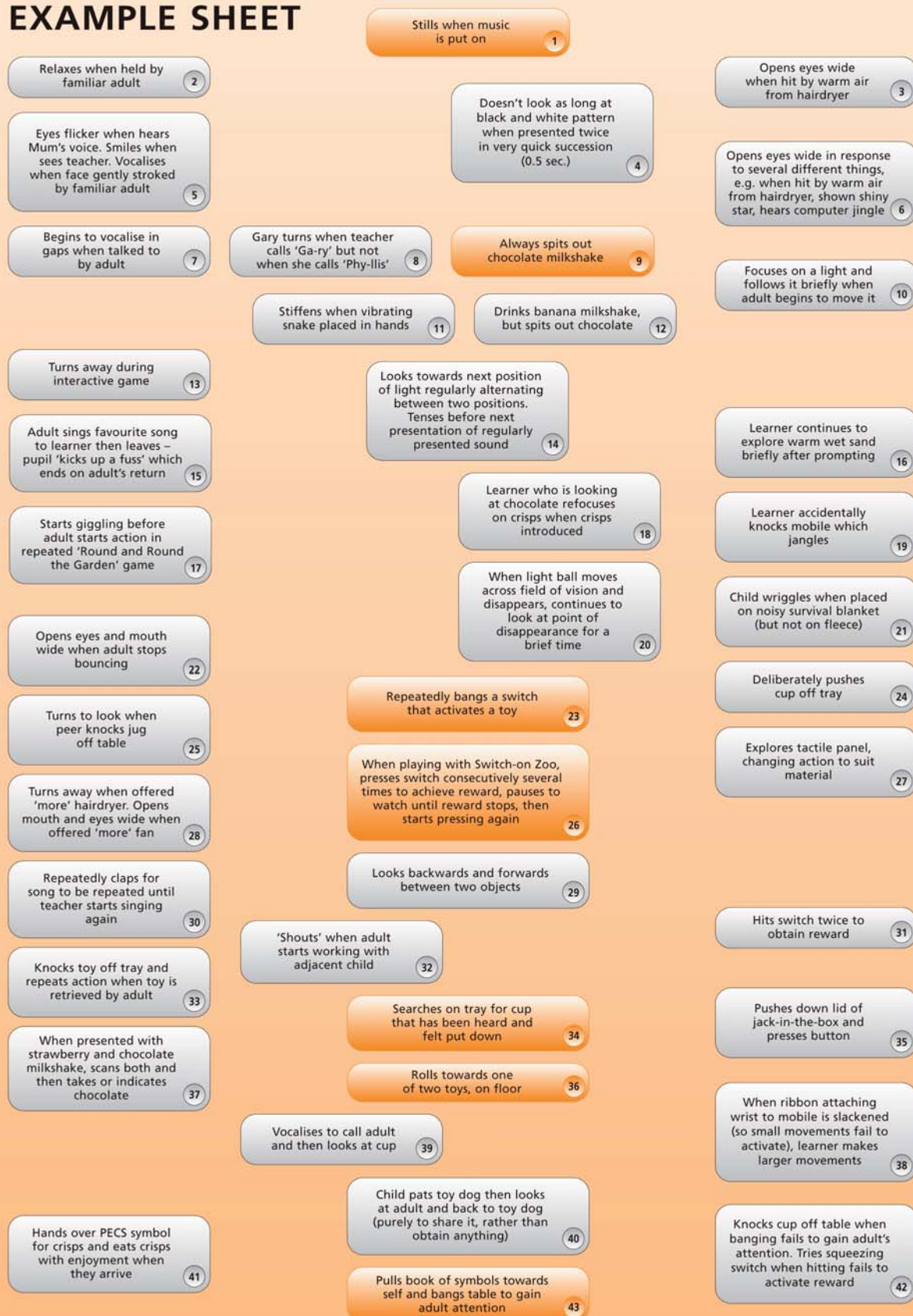
Please note: the DVD included in the original pack is not available on-line.

Enquiries regarding this DVD should be addressed to: assessment@wales.gsi.gov.uk

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Produced by the Qualifications and Curriculum Group, Department for Education, Lifelong Learning and Skills, Castle Buildings, Womanby Street, Cardiff CF10 1SX.

ROUTES FOR LEARNING EXAMPLE SHEET



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