Guideline for referring children for auditory evoked potential testing under sedation and general anaesthetic - Full Clinical Guideline

Reference no.:CG-PAEDS/4125/23

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1. Introduction

There are a small number of children for whom it is not possible to obtain cooperation for a hearing assessment. In such cases, there can be a tendency to review these children behaviourally multiple times over a prolonged period gaining little or no useful information, and this can lead to a delay in diagnosis and treatment. Where there are parental or professional concerns about hearing, to obtain prompt and reliable information for these children, Auditory Evoked Potential (AEP) testing under sedation or general anaesthetic (GA) should be considered. (GA).

2. Aim and Purpose

This guideline aims to:

- Set out a standard criterion for referral for AEP under sedation or GA.

- Reduce delays in diagnosis and treatment by limiting the number of times a child can be seen for a behavioural hearing assessment before AEP under sedation or GA is considered.
- Inform clinical decision making when choosing between sedation or GA.
- Improve parental/carer choice and joint decision making.

3. Definitions, Keywords

AEP	Auditory Evoked Potential
AEPDG	Auditory Evoked Potential Diagnostic Group
ANSD	Auditory Neuropathy Spectrum Disorder
GA	General Anaesthetic
NHSP	Newborn Hearing Screening Programme
TEOAE	Transient Evoked Otoacoustic Emission
UHDB	University Hospitals of Derby and Burton

4. Patient pathway for AEP testing under sedation and GA

Step 1:
Consider AEP under sedation and GA:

- After two unsuccessful attempts of behavioural testing.
- Significant developmental delay
- Where urgent assessment is required
- Non-organic functional hearing loss.

Step 2:
Discuss with parent/carer and complete the 'AEP under sedation/GA checklist' (appendix one). Discuss with consultant paediatrician if they have one.

Step 3:
Are there any risk factors for sedation/ ENT procedures indicated?
Yes → Consider AEP under GA
No → Consider AEP under sedation.

Step 4:
Submit 'AEP under sedation/GA checklist' to the AEPDG for review.

Step 5:
Discuss outcome with parent/carer and provide written information.

Step 6:
Verbal consent obtained.

AEP under GA → Refer to ENT
AEP under sedation → Audiology admin to arrange date/time with Sunflower Ward (RDH) or Ward 1 (QHB).

5. When to consider AEP under sedation or GA

Where sedation is being considered, it is recommended to discuss with the child's consultant paediatrician if they have one. When considering AEP under GA, refer the child to ENT. It is important to gain consent from parents/carers for all referrals and procedures. The audiologist should gain consent for the hearing assessment. For sedation, the paediatrician on the ward should gain separate consent and give information about sedation. For GA, the anaesthetist should gain separate consent and give information about GA. Audiology should aim to coordinate the appointment with any other treatment the patient may be receiving, as it is often favourable to have everything carried out at the same time (BSA 2019).

Limits of behavioural hearing assessment attempts

No more than two unsuccessful attempts at hearing assessment should be made before considering AEP under sedation/GA. A hearing assessment is deemed unsuccessful when we have NO useful information from the child or young person as to their possible hearing status (e.g., we have been unable to perform an ear examination, tympanometry, TEOAE's and have not obtained any conclusive behavioural hearing thresholds).

Urgent referrals that can bypass behavioural hearing assessment

An AEP under sedation/GA can be considered from initial referral into Paediatric Audiology or after first assessment where there are significant professional concerns about hearing, it is evident that behavioural assessment will be unsuccessful (e.g. due to significant development delay), urgent assessment is required (e.g. following bacterial meningitis or meningococcal septicaemia), or ANSD is suspected. In such cases, a patient history, parent/carer debrief (including explanation of options and risks) and consent should be conducted over the phone and prior to booking the procedure. Parents/ carers should be directed to the electronic copy of the patient information leaflet on the UHDB website.

Child needing time to develop for chronological age-related tests

The review timescale for the second attempt at behavioural assessment is at the discretion of the clinician and based on the needs of the patient (e.g., patient requires time to further develop). Typically, patients needing review due to inconclusive behavioural assessment at an appointment will be reviewed at a routine timescale (if passed NHSP) or within an urgent timescale if there is no record of previous NHSP or if NHSP or electrophysiological diagnostic testing was inconclusive. Routine is defined as 12 weeks and urgent defined as <=4 weeks.

Any timescale greater than 12 weeks should be clinically justified in the patient notes e.g., for developmental reasons. There should be no timescales greater than 12 months.

Non-organic functional hearing loss

Where there are concerns regarding non-organic functional hearing loss, audiologists should attempt the following tests before considering AEPs under sedation/GA:

- Tympanometry and acoustic reflex assessment
- Speech testing
- Transient Evoked Otoacoustic Emissions (TEOAEs)

(See UHDB (2022) *Complex hearing assessment of children* Trust guideline for test protocols)

Where all tests are inconclusive or unsuccessful, AEP under sedation or GA should be considered.

6. Sedation or general anaesthetic?

The *Sedation in Children for Painless and Painful Procedures* Trust guideline (UHDB, 2021) states that the decision to use no sedation, oral sedation, or a general anaesthetic to undergo a procedure should be taken on an individual basis and discussed with parent/carer/those with parental responsibility. The following groups of patients are at increased risk of complications or of failing oral sedation and should be considered for a general anaesthetic:

- Abnormal airway (including micrognathia, subglottic stenosis)
- Apnoeas (including obstructive sleep apnoea)
- High risk of aspiration (including significant gastro-oesophageal reflux or recurrent aspiration pneumonias)
- Respiratory disease (including acute respiratory tract infection)
- Neuromuscular disease
- Epilepsy (generalised convulsions within previous 24 hours; convulsions requiring more than one dose of midazolam/diazepam within the previous fortnight; resuscitation for a convulsion within the last month)
- Raised intracranial pressure
- Older child with significant behavioural problems
- Previous oral sedation failures/complications
- Metabolic disorders

Children over 3 should be referred for AEP under GA. To reduce frequent sedation, children who are likely to benefit from or are listed for ENT procedures under GA such as grommets, tonsillectomies and adenoidectomies should be referred for ABR under GA.

7. Parent/Carer debrief and consent

Consent should be sought for referral for AEP under sedation or HA by the referring audiologist. The audiologist should:

a. Explain the findings and limitations of any behavioural or other testing for the individual child.

b. Explain the options (including consequences) for further assessment which should include doing nothing, watch and wait (further behavioural testing), and AEP under sedation or GA.
c. Provide written information (UHDB patient information leaflets; *Auditory Brainstem Response (ABR) Testing Under Sedation* or *Auditory Brainstem Response (ABR) Under General Anaesthetic*)

8. Documentation

The appropriate hearing assessment template should be completed and care should be taken to ensure all sections are completed.

Within the same template, the management discussion including decision process for recommending AEP under sedation/GA, agreed outcome should be recorded.

The assessment report which includes the management discussions should be completed and copies sent to parents and all relevant professionals involved in child's care. Ideally the report should have been received and read by all addressees before the sedated/GA procedure (this is only not possible in emergency referrals).

Clinical preparation sheets need to be completed to alert the admin team that reports are ready for processing.

Instances where the parent/carer choses to decline a GA or sedation and wishes to continue with behavioural testing. Ensure this is clearly documented and reported copies sent to all those involved.

9. References (including any links to NICE Guidance etc.)

British Society of Audiology. 2019. Recommended Procedure: Auditory Brainstem Response (ABR) testing for Post-newborn and Adult. Front page (thebsa.org.uk) (Accessed 28/06/2022)

UHDB (2021) Sedation in Children for Painless and Painful Procedures

UHDB (2022) Complex hearing assessment of children (in publication)

10. Documentation Controls

Reference Number CG-PAED/4125/23	**Version:** 1		**Status** Final	
Version / Amendment History	Version	Date	Author	Reason
	1	17/07/2022	Head of Paediatric Audiology	N/A

Intended Recipients: Paediatric Audiologists, ENT Consultants, Adult Audiologists who see any children.	
Training and Dissemination: Guideline developed by Paediatric Audiology, Email, Training in staff meetings.	
Development of Guideline: Paediatric Audiology **Job Title: Paediatric Audiology**	
Consultation with: Paediatricians, ENT Consultants, Community Paediatricians	
Linked Documents: Complex Hearing Assessment of Children, Amplification for Childhood Hearing Impairment, Management of Otitis Media with Effusion (Glue Ear) in Children, Hearing Assessment of Babies, Calibration of Audiometric Equipment, Assessment and Management of Tinnitus and Hyperacusis in Children	
Keywords: Paediatric Hearing Assessment, Audiology, Sedation, General Anaesthetic, Auditory Evoked Potentials	
Business Unit Sign Off	**Group:Paediatric BU** **Date:Feb 2023**
Divisional Sign Off	**Group:W+C Divisional Governance** **Date:Feb 2023**
Date of Upload	March 2023
Review Date	March 2026
Contact for Review	Dr Tendai Ngwerume

11. Appendices

Appendix 1 AEP under sedation/GA checklist

Audiologist	#Audiologist name#
Site	Derby / Burton
Patient name	#Client full name#
Hospital number	#Client primary identification code#
NHS number	#Client secondary identification code#
Patient DOB	#Client date of birth#
Referral date	
Background	
Attended with	Mum / Dad / Parents / Sibling / Grandmother / Grandfather/ Foster carer/ Interpreter
Other health professionals	

SEDATION CHECKLIST

Abnormal airway (including micrognathia, subglottic stenosis)	No / Yes

Apnoeas (including obstructive sleep apnoea)	No / Yes
High risk of aspiration (including significant gastro-oesophageal reflux or recurrent aspiration pneumonias)	No / Yes
Respiratory disease (including acute respiratory tract infection)	No / Yes
Neuromuscular disease	No / Yes
Epilepsy (generalised convulsions within previous 24 hours; convulsions requiring more than one dose of midazolam/diazepam within the previous fortnight; resuscitation for a convulsion within the last month)	No / Yes
Raised intracranial pressure	No / Yes
Older child with significant behavioural problems	No / Yes
Previous oral sedation failures/complications	No / Yes
Metabolic disorders	No / Yes
Would likely to benefit from or are listed for ENT procedures under GA such as grommets, tonsillectomies, and adenoidectomies.	No / Yes
IF YOU ANSWER YES TO ANY OF THE QUESTIONS, THEN PLEASE REFER FOR AEP UNDER GA	

MANAGEMENT PLAN

Test Option	Sedation / GA
Have the options for sedation or GA including the option to do nothing been discussed	Yes / No (Please explain if you've selected no)
Has written information on the Sedation/ GA been provided to parents/carers	Yes / No (Please explain if you've selected no)
Please send a copy of the form to dhft.childrensaudiology@nhs.net for discussion at the AEPDG meeting	

FOR AEPDG USE

AEPDG meeting notes: **(Peer review indicated - Yes/No)**
Proceed with AEP under sedation
Procced with AEP under GA
Review behaviourally