Newborn hearing screening programme guidance on the management of babies who have not completed the screen and audiological assessment pathway during the COVID-19 outbreak

1. Introduction

There has been some disruption to newborn hearing screening and audiology services during the COVID-19 outbreak. It is now important that every effort is made to 'catch up' the cohort of babies with incomplete screening or diagnostic testing caused by service restrictions during this period.

This guidance is time limited and the aim of all services must be to restore to a 'business as usual' status as soon as is practically possible

Services should undertake an assessment of the risks associated with bringing babies into their service for screening / diagnostic testing with the overarching principle that the service is safe. Services should comply with trust guidelines to minimise any potential risks to staff and patients.

This guidance provides information for services that have babies with incomplete screening or diagnostic testing and how to prioritise each group within each cohort.

2. Prioritisation for unscreened or incomplete screen babies

All babies should be offered the screen and complete the screening pathway. Screening teams should identify all babies with an incomplete screen, for whom they are responsible, from the NHSP national IT system (S4H). This must include those babies where the screening team selected an outcome in S4H other than that suggested in the NHSP technical guidance.

Three advanced searches have been set up in S4H to enable local service to create lists of records that need review for screen offer or referral to audiology.

Babies without a completed screen should be prioritised in the following order:

1) NICU babies
2) Well babies

Before contact is made with any families, a check must be undertaken with relevant stakeholders (such as NHS Spine, Child Health, GP, HV) to ensure that the baby is not deceased.

3. NICU babies with incomplete screening

3.1 NICU babies ≤ 3 months (12 weeks) (corrected age)

Screen as per usual NICU protocol enter the results in S4H and refer to audiology if required.

3.2 NICU babies >3 months (12 weeks) and ≤ 6 months (corrected age)

Screen as per usual NICU protocol, enter the results in S4H and refer to audiology if required. If the baby is too active or unsettled and the AABR cannot be completed set the screening outcome to 'incomplete – baby unsettled' with the reason COVID-19 and refer to

audiology. Audiology services should decide if this immediate ABR assessment or behavioral testing at a later age dependent on service capacity.

See sections 5 – 6 for details on how to manage this referral.

3.3 NICU babies > 6 months (corrected age)

The S4H screening outcome should be set or remain as 'incomplete – lack of service capacity' with the reason COVID-19 and baby referred to audiology

See sections 5 – 6 for details on how to manage this referral.

4. Well babies with incomplete screening

4.1 Well babies ≤ 3 months (12 weeks) (corrected age))

Screen as per usual protocol enter the results in S4H and refer to audiology if required.

See sections 5 – 6 for details on how to manage this referral.

4.2 Well babies > 3 months and ≤ 6 months (corrected age)

Dependent on service capacity decide: whether:

- Baby seen by screening team. Screen as per usual protocol, enter the results in S4H and refer to audiology if required. If the baby is too active or unsettled and the screen cannot be completed set the screening outcome to 'incomplete – baby unsettled' with the reason COVID-19 and refer to audiology.

  See sections 5 – 6 for details on how to manage this referral.

and /or

- Baby seen by audiology team. If using diagnostic equipment, the presence of a bilateral TEOAE that meets the NHSP pass criteria (i.e. ≥6dB for 2 out of 4 half octave bands centred at 1.5,2,3,4 kHz with a minimum response 0dB rms SPL) is sufficient for discharge. Otherwise the baby should be referred for further diagnostic assessment. The S4H screening outcome should be set or remain as 'incomplete – lack of service capacity' with the reason COVID-19. The audiologist should enter the test results in the diagnostic section of S4H.

4.3 Well babies > 6 months (corrected age)

The S4H screening outcome should be set or remain as 'incomplete – lack of service capacity' with the reason COVID-19 and baby referred to audiology

Since these are Well Baby referrals, the presence of a bilateral TEOAE that meets the NHSP pass criteria is acceptable for discharge.

Local services may decide to set up dedicated OAE clinic (which would allow a greater throughput) with further assessment if TEOAE is not present or to set up clinics that would allow for immediate visual reinforcement audiometry (VRA) if the TEOAE is not completed or is not present.

5. Prioritisation of screen referrals for diagnostic audiological assessment

Audiology services should resume as soon as able. Services should determine the total number of babies referred from the screen that require diagnostic testing and plan their additional capacity to clear the waiting list whilst still prioritising new referrals according to clinical priority as they are received.

Clinical priority is based on the risk of a hearing loss.

Cases should be prioritised as follows:

1. cCMV positive babies and any other priority referrals from the medical team
2. Babies with a screening outcome of 'Incomplete - screening contraindicated'
3. NICU babies bilateral referrals
4. Well babies bilateral referrals
5. Unilateral referrals
6. Targeted follow-up

Services should estimate how long it will take to clear the backlog and the age profile of those on the list when they will be tested. A judgement should be made as to whether it will be better to see the youngest babies first or the oldest within each clinical category. Seeing the youngest babies first may enable more babies will be seen within expected timeframes and the waiting list may be reduced more effectively. The older babies may reach an age where behavioral testing is more appropriate. Services should judge how best to avoid the most difficult age of testing (3 months – 7 months) and where testing gives the maximum chance of success.

Both parental anxiety and concern for their child's hearing should be considered and services will need mechanisms to manage this. Where parents express concern about their child's hearing or report observing lack of response to sound however, early assessment should be prioritised

All babies should be offered an appointment in order of clinical priority.

Prioritisation Groups

5.1 cCMV positive babies and any other priority referrals from the medical team

These should be seen as soon as possible for diagnostic ABR testing as per usual protocol.

5.2 Babies with a screening outcome of 'Incomplete - screening contraindicated'

These should be seen for diagnostic ABR testing as per usual protocol.

Where testing is taking place on babies more than 12 weeks corrected age or where limited / no testing is possible due to the age of the child, see Section 6: Considerations on testing.

5.3 NICU babies bilateral referrals

These should be seen for diagnostic ABR / OAE testing as per usual.

Where testing is taking place on babies more than 12 weeks corrected age or where limited / no testing is possible due to the age of the child, see Section 6: Considerations on testing.

5.4 Well babies bilateral referrals

These should be seen for diagnostic OAE / ABR testing as per usual.

Services may decide to discharge babies who show a bilateral TEOAE that meets the NHSP pass criteria (i.e ≥ 6dB for 2 out of 4 half octave bands centred at 1.5, 2, 3, 4 kHz with a minimum response 0dB rms SPL) without any ABR testing.

Services may decide to run diagnostic testing at the same time as the TEOAE testing or bring the baby back for further testing at a later date to allow a greater throughput.

Where testing is taking place on babies more than 12 weeks corrected age or where limited / no testing is possible due to the age of the child, see Section 6: Considerations on testing.

5.5 Unilateral Referrals

Where ABR service capacity allows, this cohort should be seen for diagnostic OAE / ABR testing as usual.

If there is limited ABR service capacity services may consider the following:

- a separate OAE clinic with behavioural testing for those who have an absent OAE
- behavioural testing for at 8 months. This is considered the best option when demands for ABR service capacity is high although this should be considered on a case by case basis, particularly in NICU babies

Unilateral referrals cannot be assumed to have satisfactory hearing in the non-referred ear owing to the possibility of false negative screening results. Therefore, audiological assessment must include ear specific results. For well babies a bilateral TEOAE that meets the NHSP screening pass criteria is sufficient. For NICU babies the possibility of ANSD must be also be considered. These babies should have ear specific behavioural testing. However, ANSD may also present with normal behavioural thresholds and therefore if there is a serious suspicion of ANSD, further audiology assessment should be considered

Where testing is taking place on babies more than 12 weeks corrected age or where limited / no testing is possible due to the age of the child, see Section 6: Considerations on testing.

This should not be seen as a long-term solution and services should carefully consider the implications of an increased referral rate for the behavioral part of the audiology service. Every effort must be made to reach a point where the standard pre-covid-19 pathways for unilateral referrals are resumed.

5.6 Targeted follow up

Services should still attempt to see these as close to 8 months corrected age as possible however it is recognised that this may be delayed. Services should assess the reason for targeted behavioural follow up and prioritise these cases based on clinical need.

6. Considerations on audiological testing

1) For all cases audiology services should record on the NHSP national IT system the audiology follow-up data on babies that refer from the screen as well as any children with later identified PCHI.

2) Babies under 12 weeks corrected age should be capable of testing under prolonged natural sleep as per usual clinical pathways and every effort should be made with this age group to complete OAE / ABR testing to usual NHSP / BSA standards.

3) Care should be taken when performing bone conduction ABR on babies aged over 12 weeks. At this age, both the eHL correction and cross hearing thresholds change rapidly and sites must bear this in mind to accurately assess this age group.

4) Where the baby is restless, services may wish to change the high pass (low filter) from 30 to 100Hz.This may be helpful in some cases but must not become standard practice. Services should be aware that this can impact on the V-SN10 amplitude and thus may make threshold determination more difficult.

5) Any change to the artefact rejection beyond that recommended in the BSA procedure is to be avoided as the number of sweeps required to achieve good signal to noise ratio is likely to be self-defeating.

6) ABR responses must be judged and peer reviewed on the same criteria as in the BSA Procedures. No relaxation of the 3:1 criteria for clear response or minimal noise levels for response absent is envisaged.

7) Services are encouraged to use their own clinical judgment on the ABR test order on a case by case basis. A small amount of good quality ABR data should be considered preferable to a large amount of poor-quality data.

8) Every effort should be made to assess NICU babies by the usual NHSP pathway standards, including re-appointing as necessary. However, in babies too developmentally old for ABR testing under natural sleep, babies which have clear response to bilateral OAE testing, no parental concern and no risk factors may, in discussion with the parents, be referred for behavioral testing without the need for ABR.

9) In cases where ABR data is incomplete or impossible to obtain, clinicians are strongly encouraged to use clinical judgment on each individual case as to the care plan, taking into account the results obtained up until that point, screening results, parental concern, medical history and risk factors for hearing loss. Suitable management may include but not be limited to: reappointing for further testing, referring for management based on incomplete data, sedation / general anesthetic for ABR testing, waiting for behavioral testing. This decision should be taken in conjunction with the parents and fully documented.

10) Services should continue to send ABR cases for peer review to their local network, however ABR peer review groups should come to a local decision and it may be preferable to limit the number sent to just PCHI identified cases and the first discharge case of the month on a per tester basis.

7. For further queries

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8. Contributors

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Abbreviations

AABR	Automated Auditory Brainstem Response
ABR	Auditory Brainstem Response
ANSD	Auditory Neuropathy Spectrum Disorder
AOAE	Automated Otoacoustic Emissions
BSA	British Society of Audiology
cCMV	Congenital Cytomegalovirus
eHL	Estimated Hearing Level
NICU	Neonatal intensive care unit
OAE	Otoacoustic Emissions
PCHI	Permanent Childhood Hearing Impairment
TEOAE	Transient Evoked Otoacoustic Emissions