VERMONT

Department of Health
Children with Special Health Needs
Newborn Hearing Screening Program
108 Cherry Street, PO Box 70, Drawer 28
Burlington, VT 05402

[phone] 802-865-1330
[fax] 802-951-1218

Agency of Human Services

RECOMMENDED PROTOCOL FOR INFANT AUDIOLOGICAL DIAGNOSTIC EVALUATION

It is recommended that infants who are referred from Newborn Hearing Screening for audiological assessment have a definitive evaluation using the following protocol by 3 months of age. This protocol is based on national recommendations from the Joint Committee on Infant Hearing (JCIH) and is consistent with established protocols from many other states' universal newborn hearing screening programs.

EQUIPMENT:

All audiological diagnostic centers performing infant hearing assessments should have the following equipment, in order to perform comprehensive evaluations:

- Otoscope
- Middle Ear Analyzer with High Frequency capabilities
- Auditory Brainstem Response (ABR) with capabilities of Tone Bursts *and* Bone Conduction
- Otoacoustic emissions
- Audiometer with Visual Reinforcement capabilities

RECOMMENDED INFANT HEARING DIAGNOSTIC PROTOCOL includes all of the following:

- Otoscopy

- Evoked OAE testing (DPOAEs or TEOAEs)
  When evaluating OAEs, the following stimulus levels are recommended: L1=65 dB SPL & L2=50 or 55 dB SPL (DPOAE) or 80 dB pSPL (TEOAE)

- High Frequency Tympanometry greater than 220/226 Hz, and
  Acoustic Reflexes, using a higher frequency probe tone such as 660 Hz or 800 Hz

- Diagnostic ABR assessment:

  - Obtain a threshold search to a click ABR in 10 or 20 dB steps (this varies by clinic however 10 dB steps are recommended, particularly when approaching threshold)
  - Tone bursts at 500 Hz or 1000 Hz **and** at a high frequency (3000 Hz or 4000 Hz)
  - Responses should be assessed at 90-95 dB nHL if no responses are observed at softer levels.
  - If an absent ABR response is noted, it is recommended that a study be performed comparing a high intensity (90dB nHL) rarefaction click stimulus to a high intensity condensation click stimulus to determine if cochlear microphonic reversal occurs when the polarity of the click stimulus is reversed. If there is cochlear microphonic reversal combined with an absent Wave V response, auditory dys-synchrony should be suspected. Correlation with OAE should be made.
  - Bone conduction click ABR if air conduction click ABR threshold is elevated or abnormal
  - Click ABR at a high intensity to assess the latency and morphology of I, III, V, I-III, III-V and I-V for the purpose of retro-cochlear evaluation (optional)

- Visual Reinforcement Audiometry or Behavioral Observation Audiometry to support physiologic test results

NOTE: *Each clinic will need to establish its own normative values. As a general guideline, normal sensitivity for clicks may be defined as a repeatable wave V at 20 dB nHL.*

AFTER DIAGNOSIS: RECOMMENDED REFERRALS FOR FURTHER EVALUATION AND INTERVENTION:

- For Vermont resident newborns and infants screened in Vermont hospitals, in accordance with Act 32, Birth Information Network, a copy of the **diagnostic audiological report** should be sent to: Vermont Department of Health, Newborn Hearing Screening Program, 108 Cherry Street, P.O. Box 70, Drawer #38, Burlington, Vermont 05402

- For any child diagnosed with hearing loss, referral to otolaryngology, ophthalmology, and genetics is recommended.

- Infants and toddlers with hearing loss should be referred to early intervention services. In Vermont, please contact: The Vermont Parent-Infant Program (early intervention for infants who are deaf or hard of hearing) of the Vermont Family, Infant and Toddler Program at: 1-800-870-6758 or (802)254-3929 (V/TTY).

Please note that families may be traveling quite a distance for the diagnostic evaluation. If hearing loss is diagnosed and amplification is recommended, there may be a more local audiologist who could serve the child and family for dispensing and audiological management needs. A list of resources in Vermont may be obtained by calling the Vermont Department of Health's Universal Newborn Hearing Screening Program, at 1-800-660-4427, ext 1333, or (802) 865-1333. You may also access these resources on-line at **http://healthvermont.gov/** (click on Children and Families, then Universal Newborn Hearing Screening under the Hearing Health section).

For any clinical questions or comments, please contact Stacy M Jordan, MA CCC-A, Clinical Coordinator, at 1-800-660-4427. Ext 1330 or sjordan@VDH.state.vt.us

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