A Test to Assess the Auditory Brainstem Response to Speech
Approximately 5% to 10% of children are diagnosed with learning disabilities.

**BioMARK (Biological Marker of Auditory Processing)**, part of the Navigator PRO family of diagnostic products, is a neurophysiological test used to quickly & objectively identify disordered processing of sound that has been associated with learning impairments in many children.

**Why BioMARK?**

- **Studies** at the Northwestern University Auditory Neuroscience Laboratory on children from 8-12 years of age have shown that the BioMARK response is abnormal in approximately 30% of children who have been diagnosed with various learning problems.
- **Children** with learning problems who have abnormal BioMARK responses will benefit most from auditory training programs.
- **BioMARK** is an objective test, requiring no behavioral response.

**BioMARK responses have been studied on normal hearing children from 8-12 years of age who have various diagnoses that may include auditory-based learning problems, such as dyslexia, central auditory processing disorders (CAPD), specific language impairment (SLI), learning disability (LD), and attention deficit hyperactivity disorder (ADHD).**

**Who is a candidate for the BioMARK test?**

Normative data for the BioMARK response is available for normal hearing children between 8-12 years of age. The child must be capable of sitting relatively quietly for approximately 30 minutes.

**How is the BioMARK test performed?**

- **Child** should be awake, but comfortable & quiet for 20-30 minutes (i.e. watching video)
- **Electrodes** are placed on the head using a standard, 1-channel ABR montage
- **An insert earphone** is placed in the right ear for delivery of the acoustic stimulus
- **Click evoked ABR** is performed first to confirm normal standard ABR
- **Two trials of 3000 averages** are performed, added together & responses averaged
- **Wave V and A** are marked by user with normative wave template as guide
- **Computer-assisted measures** of latency, slope & spectral amplitude along with overall BioMARK score are calculated & displayed for review
- **Standard BioMARK report templates** are available for printing results
Approximately 5% to 10% of children are diagnosed with learning disabilities. **BioMARK (Biological Marker of Auditory Processing)**, part of the Navigator PRO family of diagnostic tools, quickly identify disordered processing of sound that has been associated with learning impairments in many children.

**BioMARK score & response measures display for easy analysis**

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if the child’s BioMARK response is abnormal, what is the next step?
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The child may be a good candidate for auditory-based intervention training. Research at Northwestern University Auditory Neuroscience Laboratory has shown that some children who have disordered neural responses to sound (reflected by BioMARK) may benefit from commercially available computer-based auditory training programs.1

**If BioMARK results are normal, but other types of behavioral tests suggest that the child has auditory-based learning problems, what is the next course of action?**

Studies at Northwestern University showed that 70% of children with diagnosed learning problems had normal BioMAP responses. No single test, including BioMARK, assesses all of a child’s abilities. Because BioMARK is only one test, other types of evaluations, such as a psychoeducational assessment, which may be available through the child’s school or a private practitioner, should be considered.

**Future Developments**

- Studies are currently underway at Northwestern University to assess the BioMARK response on normally developing children from 3-5 years of age
- Test potential may be even greater if the BioMARK response can identify young children at-risk for auditory-based learning problems before their formal education begins

*For more information on the research behind BioMARK, visit the website of Northwestern University Auditory Neuroscience Laboratory at [www.communication.northwestern.edu/brainvolts/clinicaltechnologies/](http://www.communication.northwestern.edu/brainvolts/clinicaltechnologies/).*

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1References on file.

*BioMARK was developed by Nina Kraus, Trent Nicol, Erika Skoe and Steven Zecker at Northwestern University Auditory Neuroscience Laboratory, Evanston, IL.*
Complete Hearing Diagnostic Solutions

AEP
Standard auditory evoked potentials including ABR, ECochG, MLR, ALR, P300, VEMP and EABR

CHAMP****
Cochlear Hydrops Analysis Masking Procedure advanced technology option in AEP to assist in the assessment of cochlear hydrops

SCOUT*
Full range otoacoustic emission test capability including DPOAE, TEOAE and SOAE

BioMARK**** Biological Marker of Auditory Processing

HINT™ Pro
Comprehensive system for evaluating functional hearing in quiet and in noise

Your Local Bio-logic Representative: