AUDIOLOGICAL EVALUATION
TEST DATE: November 10, 2010

HISTORY

Name: Franklin Ford
Age: 4 years 2 months
Reason for visit: Hearing evaluation
Hearing history: Franklin`s mother reports that he passed his newborn hearing screening after multiple attempts. He is seen today for a follow-up evaluation due to parent concerns about his hearing.
Middle ear history: Franklin has a negative history of ear infections.
Family history of childhood hearing loss: negative
Developmental progress: Franklin's mother reports that he is inconsistent in his responses to sounds at home.
Medical home: Franklin lives with his parents in Seattle and is followed by Dr. Steven Smith at Cascade Pediatrics.

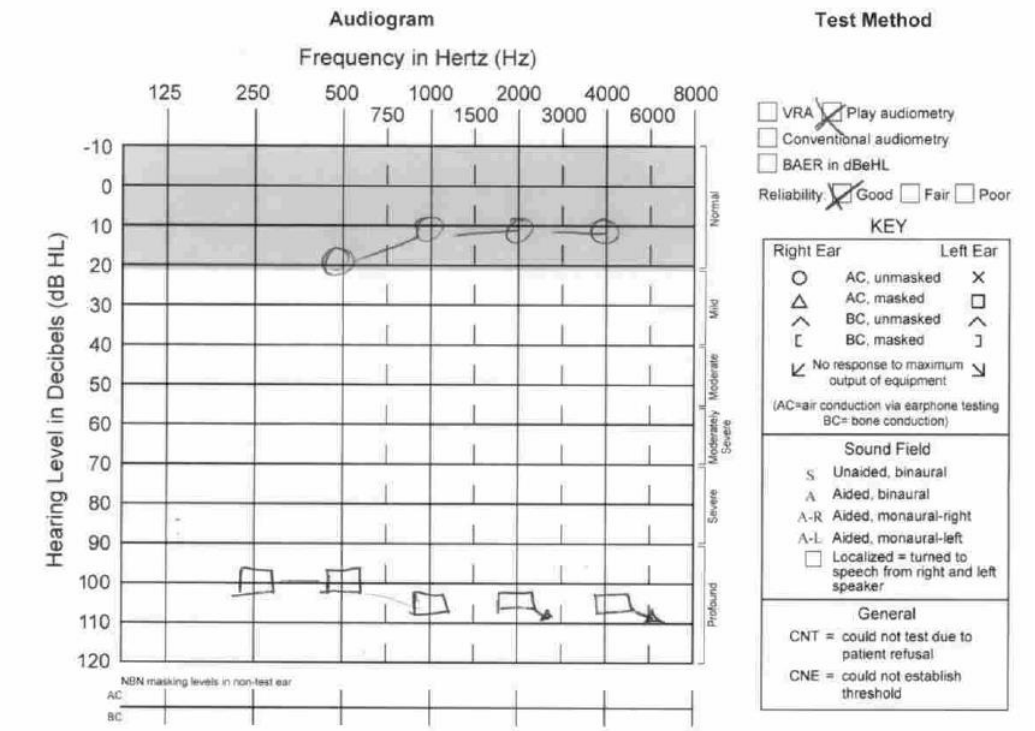
TEST RESULTS

Behavioral Assessment

Procedure: conditioned play audiometry (CPA): a child is taught to respond to auditory stimuli by playing a game such as putting a peg in a board. Threshold is determined as the lowest decibel (dB) level at which the child responds a minimum of two times. Testing was completed using a test assistant in the test room with the child. A judgment of the reliability of the child's responses is noted on the audiogram.
Normal range: Normal hearing is defined as thresholds of 0-20 dBHL
Results:

UW Medicine

Pediatric Audiology, Box 357920
Center on Human Development and Disability (CHDD)
University of Washington Medical Center
Seattle, WA 98195

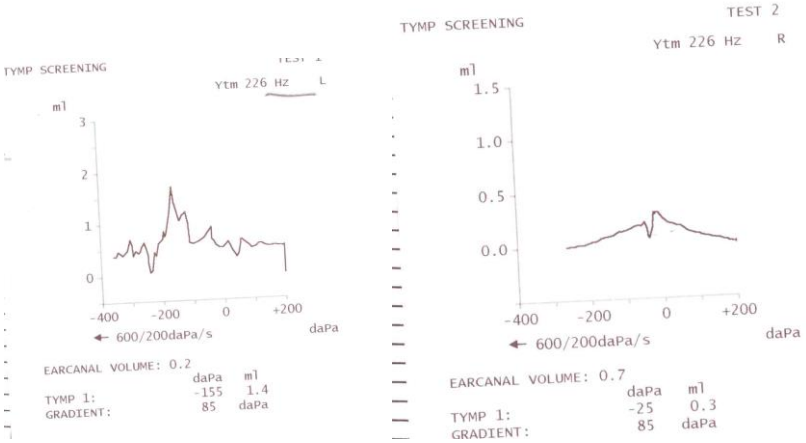


Immittance and Otoscopy

Procedure: Tympanometry measures the function of the outer and middle ear systems. Tympanometry was conducted using a 220 Hz probe tone.

Normal range: Normal compliance values are indicated by values greater than .1 ml., and peak pressure from -200 to +100daPa.

Results:



PT.NO: **U8955222**

NAME: FORD, FRANKLIN

DOB: 10-10-2005

UW Medicine

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Seattle, WA 98195

PROGRESS – BLUE

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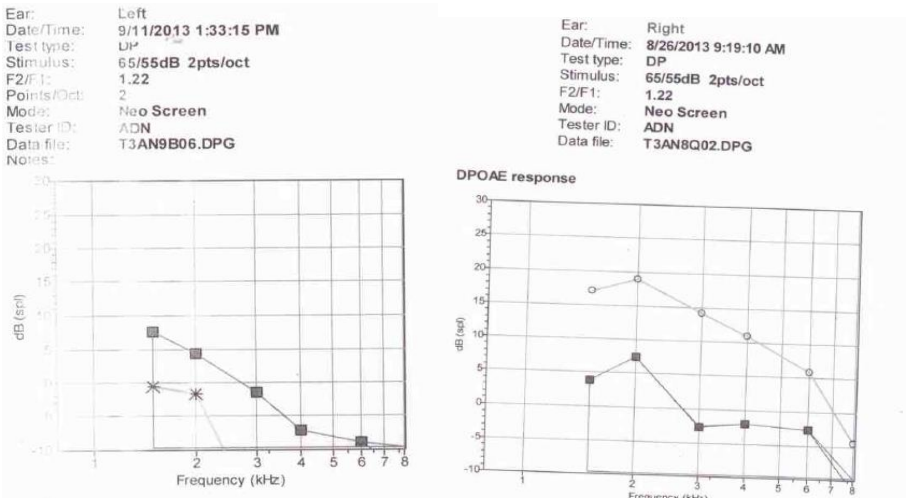
Evoked Otoacoustic Emissions

Procedure: The status of the child's peripheral hearing status was evaluated using both distortion product evoked otoacoustic emissions (DPOAE). OAEs are acoustic signals generated by the cochlea in response to external auditory stimulation. OAEs are thought to be generated by the outer hair cells within the cochlea and are independent of neural activity.

Normal range:. A normal DP OAE response is indicated by a signal to noise response (SNR) greater than 5 dB and a minimum DP level of -8. Individuals with normal cochlear function have robust OAEs in response to stimulation from 1000-5000 Hz; whereas individuals with hearing loss greater than 30 dB HL show no OAE in the frequency region of the hearing loss.

Results:



Outcome Measure: Parents' Evaluation of Aural/Oral Performance of Children (PEACH) questionnaire

Measure: Franklin's parent filled out the PEACH questionnaire, a list of 13 questions designed to evaluate a child's listening challenges and receptive communication using a 5-point scale.

Expected range: Quiet=75-100; Noise=60-100 , Overall=70-100

Results: Quiet= 90; Noise= 40, Overall=80

ASSESSMENT

Franklin demonstrates normal hearing in the right ear and a profound sensorineural hearing loss in the left ear. Specifically, he demonstrates behavioral hearing thresholds across the frequency range in his right ear at levels of 10 to 20 dBHL and thresholds in the left ear at levels of 100 to 105 dBHL from 250 to 1000 Hz and no response at 2000 and 4000 Hz; testing in the left ear was completed with masking in the right ear. Franklin's ability to discriminate speech was evaluated using words from the NU-CHIPS lists presented by live voice in the soundfield at a conversational level, both in quiet and in noise (multi-talker babble). Franklin was able to achieve excellent performance in quiet (100%) and poor performance in noise (16%) when the speech stimulus was presented on the left side, closer to his poorer ear and noise presented to the right side. These results show that Franklin has challenges hearing and understanding in challenging noisy listening situations. Franklin demonstrates robust otoacoustic emissions in the right ear and absent emissions in the left ear, consistent with a unilateral hearing loss and ruling out that the hearing loss is neural only in origin/ruling out auditory neuropathy. He shows normal outer/middle ear function in both ears on tympanometry, also confirming a sensorineural hearing loss in the left ear. Franklin's mother's responses on the PEACH questionnaire,

indicate the family notes no significant challenges with communicating with Franklin in quiet, but significant challenges in noisy settings. Today's results show a change in hearing compared to his newborn hearing screening, however, given that multiple attempts were made to get passing results, the validity of the screening is in question.

RECOMMENDATIONS

Franklin's mother, Francine, was counseled regarding the diagnosis of a unilateral sensorineural hearing loss and its implications on Franklin speech and language development, and education. It was discussed that children with unilateral hearing loss often have difficulty hearing in challenging listening settings when background noise is high and have difficulty localizing, or finding the source of sound. Franklin will benefit from hearing technology as discussed below.

Hearing loss:

1. It is recommended that Franklin's hearing be monitored closely with hearing evaluations every three months, until hearing has been determined to be stable and then every 6 months, thereafter. The impact of Franklin's hearing loss will be monitored with ongoing evaluations of his ability to recognize speech in noise as well as outcome questionnaires for the family and for school
2. The etiology of Franklin's hearing loss is unknown at this time and his parents are advised to pursue medical evaluations including a CT/MRI scan of the ear, genetic testing, and testing for congenital infections. For these evaluations, he is referred to Seattle Children's Otolaryngology Clinic (206-987-2105).

Hearing Technology:

3. Hearing technology options for children with unilateral profound hearing loss/single-sided deafness were discussed with Franklin's mother. Franklin is a candidate for using hearing technology that utilizes a microphone placed on the side of the head with hearing loss that transmits sound to the normal hearing ear. Devices include a softband bone conduction sound processor or a CROS system that utilizes two hearing aids and nonoccluding earmold/ear domes. Lastly, Franklin is also a candidate for using a remote mic/FM-DM system where the parent/caregiver's voice is transmitted wirelessly from a transmitter microphone to a personal receiver worn on the normal hearing ear using a nonoccluding eartip.

4. Franklin is a candidate for using a remote mic/ DM-FM system in school to help him hear the teacher above the classroom noise. This recommendation will be forwarded on to the educational audiologist when hestarts kindergarten.

Lisa Mancl, M.S., CCC-A
Pediatric Audiologist, Clinical Preceptor
206-598-9344, lmancl@uw.edu

Sandy Stone
Graduate Audiology Student

cc: parents (Carol and Chris Collins)
primary care physician (Steven Smith @ Cascade Pediatrics)
otolaryngology (Dr. Jay Rubinstein @ UWMC Otolaryngology)