AUDIOLOGICAL EVALUATION and HEARING AID CHECK
TEST DATE: August 13, 2013

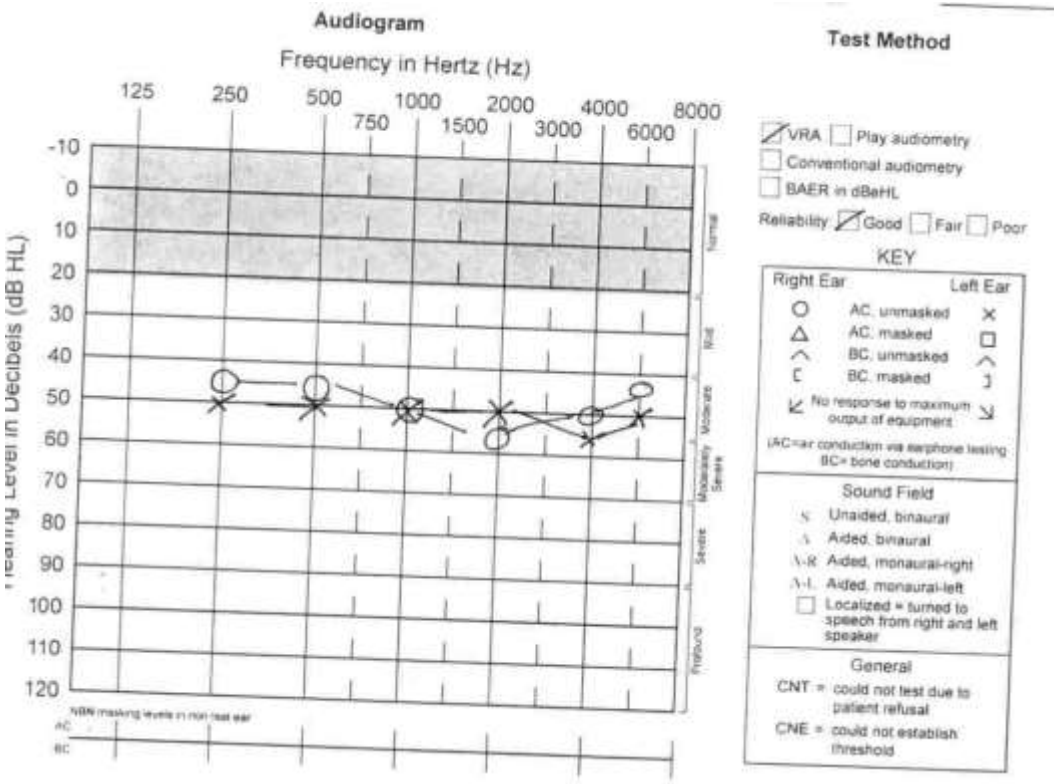
## HISTORY

**Name:** Kelly Kard
**Age:** 16 months
**Reason for visit:** Follow-up audiological evaluation and hearing aid check.
**Hearing history:** Kelly presents with a bilateral moderate sensorineural hearing loss for which she has been followed in this clinic since her hearing loss was diagnosed at 2 months of age. Kelly's hearing loss was diagnosed with brainstem auditory evoked response (BAER) testing on July 25, 2012; tone-pip thresholds were measured at 35 to 45 dBeHL in both ears and bone conduction testing showed no air-bone gap. Kelly's hearing was last evaluated at this clinic on May 17, 2013; she demonstrated behavioral hearing thresholds of 40 to 60 dBHL from 500 to 4000 Hz in both ears. Her hearing loss has been stable since diagnosis. The etiology of Kelly's hearing loss is unknown at this time, however, Kelly's parents are in the process of evaluations (genetics, imaging) through the Hearing Loss Clinic at Seattle Children's. The age of onset is thought to be congenital since she did not pass her newborn hearing screening at 2 days of age.
**Middle ear history:** negative history of ear infections
**Amplification:** Kelly has worn binaural hearing aids (Phonak Sky Q50) since her initial fitting at age 3 months. Her hearing aids use reached full-time use at approximately 6 months of age and she continues to wear the aids full time. Her parents report that she has recently started pulling off her hearing aids. Kelly's parents check the battery and earmolds daily and store the hearing aids in a drying kit nightly. Previous aided testing at her visit on May 17, 2013 demonstrated aided detection of all Ling sounds at both an average conversational level (50 dBHL) and a soft speech level (35 dBHL).
**Hearing assistance technology:** Kelly's family has recently started using a remote mic system from the King County loaner bank (Phonak Roger Inspiro transmitter and Roger 15 receivers) in conjunction with her hearing aids; they are using the system at the playground and while she is in her stroller on walks.
**Intervention:** Kelly and her family receive weekly home visits through the Family Conversations early intervention program with their specialist, Mindy Taylor.
**Developmental progress:** Kelly's parents report that Kelly has several words that she uses consistently and seems to understand simple instructions.
**Medical home:** Kelly lives with her parents and older sister in Renton. She is followed by her pediatrician, Dr. Jones at Valley Medical Center.

## TEST RESULTS

**Behavioral Assessment**

**Procedure: visual reinforcement audiometry (VRA)**: a child is taught to respond to auditory stimuli with a head turn response toward the sound, and the child is then rewarded with the activation of a mechanical toy. Threshold is determined as the lowest decibel (dB) level at which the child responds a minimum of two times. Transducers used are insert earphones and soundfield speakers. 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:**

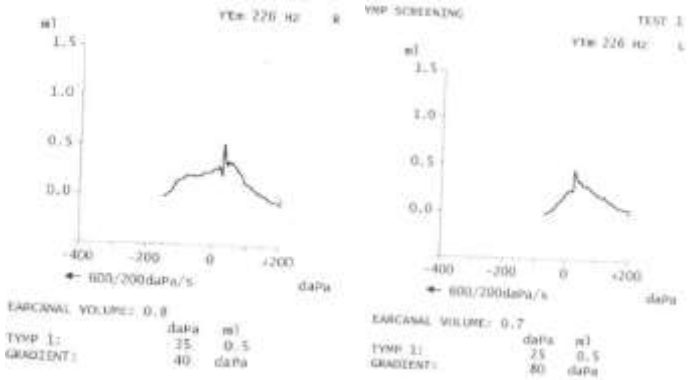



**Immittance and Otoscopy**

**Procedure**: Tympanometry measures the function of the outer and middle ear systems. Tympanometry was conducted using a 220 Hz probe tone. Otoscopy indicates that both ear canals are clear.

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

**Results:**




**PT.NO: U2563222**

**NAME: KARD, KELLY**

**DOB: 04-12-2012**

**UW Medicine**

**Pediatric Audiology, Box 357920**
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**Seattle, WA 98195**



PROGRESS – BLUE

**Outcome measure: Aided Speech detection testing**

**Measure**: Kelly's ability to detect speech sounds while wearing her hearing aids was evaluated using the recorded Ling sounds presented at a conversational speech level of 50 dBHL and at a soft speech level of 35 dBHL.
**Results:** Kelly is able to respond to all Ling sounds (a, ee, u, s, sh, m) at both levels (35 and 50 dBHL) while wearing her hearing aids.

**Outcome measure: LittlEARS Auditory Questionnaire**

**Measure**: The LittlEARS parent questionnaire is designed to assess a child's auditory development from the perspective of the parent. A sample question: "Does your child respond to distant sounds?"
**Expected range**: the expected range for her age is 17 to 24.
**Results:** 21

**Hearing Aid Check:** The hearing aids were adjusted using the Desired Sensation Level (DSL) prescription method and real ear measures using the Verifit electroacoustic/real ear system. The target and measured values were derived after measurement of the child's real-ear-to coupler difference (RECD). Aided SII values demonstrate the proportion of the speech signal that is audible for both average and soft speech; normative values are derived from published norms for the degree of hearing loss at .5, 1, and 2 kHz,
**Current hearing aids and settings**: binaural Phonak Sky Q50 M13 digital behind-the-ear hearing aids.

- Program 1 for everyday listening using wide dynamic range compression
- non-linear frequency compression with a cutoff frequency of 4.5 kHz
- Additional programs and volume control are deactivated

**Datalog:** average of 6 hours of daily use since last visit 3 months ago.

**Earmolds:** Kelly's earmolds are fitting somewhat small due to ear growth since her last visit; new earmold impressions were made.

- Style: full shell
- Venting: none
- Full helix
- Material/color: Silicone swirl (blue/yellow)

| Manufacturer/Mode | Serial # | dBSPL at eardrum | 250 H | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 6000 Hz | Aided SII |
|---|---|---|---|---|---|---|---|---|---|
| | | **Right Ear** | | | | | | | |
| **Phonak Sky Q50** | **X0112A** | Target output -avg speech (65 d | 92 | 91 | 90 | 91 | 95 | | 78-90 |
| | | Measured output-avg speech | **92** | **90** | **90** | **90** | **93** | **94** | **85** |
| | | Target output-soft speech (55 d | 79 | 82 | 82 | 81 | 81 | | 70-85 |
| | | Measured output-soft speech (5 | **79** | **81** | **82** | **81** | **81** | **78** | **82** |
| **Phonak Sky Q50** | **X0112B** | **Left Ear** | | | | | | | |
| | | Target output -avg speech (65 d | 92 | 91 | 90 | 91 | 95 | | 78-90 |
| | | Measured output-avg speech | **92** | **90** | **90** | **90** | **93** | **94** | **85** |
| | | Target output-soft speech (55 d | 79 | 82 | 82 | 81 | 81 | | 70-85 |
| | | Measured output-soft speech (5 | **79** | **81** | **82** | **81** | **81** | **78** | **82** |

## ASSESSMENT

**Hearing loss:** Kelly demonstrates a moderate hearing loss in both ears. Specifically, Kelly demonstrates behavioral hearing thresholds of 45 to 60 dBHL in both ears from 250 to 6000 Hz. She shows normal tympanograms, indicating normal outer/middle ear function in both

ears, and supporting that her hearing loss is sensorineural in nature. Today's results are consistent with previous results, indicating that Kelly's hearing loss continues to be stable.

**Amplification:** Kelly is full-time hearing aid user, as indicated by her parents' report of her full time use as well as datalog measures recorded by the hearing aid showing an average of 6 hours of daily wear time. She has shown some recent interest in removing her hearing aids, likely an age-appropriate curiosity. When wearing her hearing aids, Kelly shows the ability to detect a full range of individual speech sounds presented at both an average conversational level and a soft conversational level. On the LittlEARS parent questionnaire, Kelly scores in the expected range for her current age, indicating that she is meeting auditory development milestones. An electroacoustic evaluation of the hearing aids indicate that current settings achieve target DSL values for gain for soft and average speech and aided SII values fall within the expected range for the degree of hearing loss. Aided SII measures indicate that when wearing her hearing aids, 82%/81% of soft speech and 85%/92% of average speech is audible in a quiet setting for the right and left ears, respectively.. In contrast, without hearing aids 32%/37% of speech is audible. New earmold impressions were made today due to her molds not fitting from ear growth.

## RECOMMENDATIONS

**Hearing loss:**

1. It is recommended that Kelly's hearing be monitored closely with hearing evaluations every 6 months; her next evaluation will be in February 2014.
2. It is recommended that Kelly's family follow-up at Seattle Children's Otolaryngology for further testing (genetics, imaging) to explore the etiology of the hearing loss.

**Hearing Aids**:

3. It is recommended that Kelly continue to wear her hearing aids at the current settings full-time. Her parents are encouraged to persist with putting her hearing aids on after she removes them. In addition, they are encouraged to use a hat as a deterrent to removal.
4. It is recommended that Kelly's parents continue to check the hearing aid batteries and clean the earmolds daily and store in a drying kit nightly. They are also encouraged to complete a weekly listening check.
5. It is recommended that the status of Kelly's hearing aids and earmolds be monitored closely at her regular follow-up visits. Earmolds will be re-made at these visits as needed due to ear growth.

**Hearing Assistance Technology:**

6. It is recommended that Kelly's family use a remote mic system (Phonak Roger transmitter and Roger receivers) in conjunction with her hearing aids to help her hear when distance and noise making listening more challenging.

**Intervention:**

7. It is recommended that Kelly's family continue to receive regular early intervention services to facilitate Kelly's communication skills and amplification use through parent education and support.

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cc : parents (Karen and Kit Kard)
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early intervention (Mindy Taylor @ Family Conversations)
otolaryngology (Seattle Children's Hearing Loss Clinic)