Audiometric Screening Training

Presented by
Child Health and Disability Prevention (CHDP) Program
Los Angeles County Department of Public Health

Objectives

By the end of the training, participants will be able to:

1. Demonstrate understanding that Play Audiometry can be used on children 3-6 years of age, children with special needs or older children who appear to be shy.
2. Identify 4 things needed for successful screening.
3. Demonstrate how to condition, recondition, and screen using Play Audiometry.
4. Identify the recommended tone and the difference between pulse, steady, and warble.
Objectives (Continued)

5. Identify 2 examples of visual cues and 1 example of patterning during screening.
6. Understand and demonstrate the steps of Play Audiometry and Traditional Audiometry (for patients 7 years and older).
7. Be able to properly document screening results and refer abnormal findings.

Audiometric Screening and Play Audiometry Training
**Bright Futures Hearing Screening Recommendations**

### EARLY CHILDHOOD

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<th>12m</th>
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<th>30m</th>
<th>3 y</th>
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- To be performed

* Risk assessment to be performed with appropriate action to follow, if positive

### MIDDLE CHILDHOOD

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### ADOLESCENCE

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<table>
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<tr>
<th>AGE</th>
<th>18 y</th>
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<th>20 y</th>
<th>21 y</th>
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<tr>
<td>Hearing</td>
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= range during which a service may be provided

Screen both ears at 6000 Hz and 8000 Hz once between 11-14 y/o, once between 15-17 y/o, and once between 18-21 y/o
The Importance of Early Screening

1. Hearing loss affects the child and the entire family.
2. Failure to identify hearing loss at 3-6 years of age can result in lifelong developmental deficits.
3. Early discovery of hearing loss is the key to successful treatment.

How Hearing Loss Affects the Child

1. Affects their ability to communicate
2. Interferes with normal speech development
3. Isolates the child from family and friends
4. Associated with self-esteem issues
5. Poor academic performance
Anatomy of the Ear

Anatomy and Physiology of the Ear – How Hearing Works
4 Things Needed for a Successful Screening

1. Qualified person to perform screening
2. Calibrated audiometer – annually
3. Properly functioning audiometer
4. Quiet screening environment
Review of Equipment for Play Audiometry

A. Audiometer

a. Calibration

b. Knobs
- Power Switch
- Ear Selector Control
- Frequency Dial – Hertz
- Intensity – Decibels
- Tones – 2 or 3 types

c. Ear Phones

d. Cords

Audiometric Screening and Play Audiometry Training

Frequencies

Hz = Hertz (Frequency)
- 4000 Hz
- 3000 Hz
- 2000 Hz
- 1000 Hz

Each frequency is done as a separate test!
Intensities

dB = decibel (Intensity)

90 dB - Conditioning
50 dB – Reconditioning
20 dB or 25 dB - Screening

Tones

Three types of tones:

a. Pulse tone – ONLY recommended tone

b. Steady tone

c. Warble tone
Review of Equipment for Play Audiometry

B. Blocks
   a. Shape
   b. Size
   c. Color
   d. Edges

C. Noise Free Baskets
   a. Plastic
   b. Wicker

References


Speech Observations

- A 1 year old normally communicates by using **one** word. For example, “up” means “pick me up”.
- A 2 year old normally uses **two** word phrases. For example, “me up” means “pick me up”.
- A 3 year old normally uses **three** word sentences like “pick me up”.
- A 4 year old normally uses **four** word sentences like “pick me up now”.

Play Audiometry
Screening Procedures
A. Conditioning
Teaching the child how to play the game

1. Screening Preparation
2. Present Beep
3. Demonstrate Game
4. Present Tone, Demonstrate – You Go First
5. Present Tone, let child win
6. Child Plays Alone
A. Conditioning
Step 1: Screening Preparation

1. Position child participant on your dominant side for screening
2. Power ON audiometer
3. Set audiometer to the RIGHT EAR
4. Keep the EARPHONE on the TABLE
5. Set audiometer to 90 dB
6. Set audiometer to 4000 Hz
7. Set audiometer to PULSE TONE

Conditioning
Step 2: Present Beep

1. Introduce the game
2. Ask child to listen
3. Press tone for “1 Mississippi”
4. Acknowledge that child heard the sound
**Conditioning**

**Step 3: Demonstrate Game**

1. Screener and child each get a block.
2. Instruct and prompt child to put block in the basket when beep is heard. (screener points to ear and taps basket, but DO NOT put the block in the basket).
3. Give empty basket to child

**Conditioning**

**Step 4: Present Tone, Demonstrate**

Screener Goes First

1. Ask child to listen 🎧
2. Press tone
3. Screener puts block in the basket first
4. Child follows after
5. Screener praises the child: “Wonderful!”, “Good job!”, “Awesome!”
**Conditioning**

**Step 5: Present Tone, Let Child Win**

1. Screener and child each get a block
2. Screener: “Let’s see how fast you are.”
3. Ask child to listen
4. Press tone
5. Let the child win (child puts block in basket first)
6. Screener follows after
7. Screener praises the child: “Wonderful!”, “Good job!”, “Awesome!”

**Conditioning**

**Step 6: Child Plays Alone**

1. Give child a block (screener does not get a block)
2. Ask child to listen
3. Press tone
4. Child puts block in the basket
5. Screener praises the child: “Wonderful!”, “Good job!”, “Awesome!”
B. Confirm

1. Give child a block
2. Set audiometer to 50db, 4000 Hz
3. Place earphones on child (red to right ear)
   a. Remove items that impede screening (e.g. glasses, earrings, headbands, etc)
   b. Push back any hair covering the ears
   c. Earphones should be in the middle of the head and in line with the ears
4. Ask child to listen
5. Press tone
   a. If child puts block in basket, start screening

Confirm (continued)

What if the child does not respond at 50 dB?

1. If child does not put the block in the basket, switch to the left ear.
2. If child still does not put the block in the basket, take earphones off and repeat conditioning (steps 1-6).
3. If child does not respond after repeating conditioning (steps 1-6), schedule child for a re-screen in 2-6 weeks.
Why will the child not put the block in the basket?

Three Reasons:
1. The child does not understand the game.
2. The child is not paying attention or distracted.
3. The child cannot hear at that frequency.

C. Screening

1. Set audiometer at 20 or 25 dB, 4000 Hz
2. Confirm ear selector control knob is set to right ear
3. Give child a block
Screening (continued)
Right Ear

Praise child each time they drop block into the basket.


Left Ear

Switch to left ear.
Praise child each time they drop block into the basket.


Remove earphones and thank the child for playing the game. Document results.
Screening (continued)

What if the child does not respond at any ear?

Give child a block.

If no response to ANY of the Hertz (Hz) at 25 dB, proceed to the reconditioning steps to continue screening.

RECONDITIONING STEPS

Reminding the child how to play the game

**IF NO RESPONSE AT ANY OF THE FREQUENCIES (1000, 2000, 3000, 4000)**

- Stay at same frequency (Hz)
- Set Audiometer to 50 dB
- Present the beep

<table>
<thead>
<tr>
<th>If child puts block in the basket:</th>
<th>If child does not put block in the basket:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1. Immediately document not pass (-) at this frequency while praising child</td>
</tr>
<tr>
<td>1. Praise the child</td>
<td>2. Set audiometer to 25 dB</td>
</tr>
<tr>
<td>2. Give child a block</td>
<td>3. Continue screening at next frequency (Hz)</td>
</tr>
<tr>
<td>3. Set audiometer to 25 dB</td>
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<tr>
<td>4. Introduce the beep</td>
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</tr>
<tr>
<td>5. Child puts block in the basket</td>
<td></td>
</tr>
<tr>
<td>(If child does not put block in the basket, immediately document not pass (-) at this frequency)</td>
<td></td>
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<tr>
<td>6. Praise the child</td>
<td></td>
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<tr>
<td>7. Continue screening at next frequency (Hz)</td>
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</tbody>
</table>
Important Steps to Remember

If the child still has a block in their hand at the END of the screening:
• Stay at the same frequency
• Increase to 50 dB or last frequency heard
• Press the tone
• Let the child drop the block in the basket to end the “game” successfully
Things to avoid

1. Avoid visual cues
   a. Examples:
      • Turning your head to look at the child when pressing the tone
      • Blinking when pressing the tone
      • Any obvious body movements or smiling when pressing the tone

Things to avoid (continued)

2. Avoid auditory cues
   a. Examples:
      • Asking child, “Did you hear that?” when pressing tone
      • Saying, “Put the block in the basket” when pressing tone

3. Patterning
   a. Example:
      • Saying, “Listen” and immediately pressing the tone each time
   b. Avoid establishing a rhythm or pattern when pressing the tone
Uncooperative Child

- Most challenging and important to screen due to possible hearing loss.
- Provide enough time to screen.
- After several unsuccessful attempts, repeat procedure in 2-6 weeks.
- If child is uncooperative on second visit, refer to hearing specialist.

Documentation

Complete documentation of audiometric screening results on the audiogram:

1. Record a passing audiometric result with a check mark (✓) at the completion of the screening procedure.

2. Immediately record a non-passing audiometric result with a dash mark (–) while praising the child.
### Audiometric Screening and Play Audiometry Training

**LAST NAME:** Doe  
**FIRST NAME:** John  
**AGE:** 4

**PLACE OF SCREENING:** Dr. Audio  
**SCORING:** Child responds at 25 dB: ✅  
**AUDIOMETER MODEL:** Ambo  
**Child does not respond at 25 dB:** ☐  
**DATE OF LAST CALIBRATION:** 11/1/17

<table>
<thead>
<tr>
<th>1st Screen</th>
<th>RIGHT EAR:</th>
<th>2nd Screen</th>
<th>LEFT EAR:</th>
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Comments:  

Referral to:  

*Per AAP/Bright Futures Periodicity update February 2017, screen audiometry including 6,000 and 8,000 Hz high frequencies once between ages 11-14 years, once between 15-17 years, and once between 18-21 years.*
### Referral & Follow Up

If child does not pass:

a. 1st screening, rescreen in 2-6 weeks.
b. 2nd screening, refer to a specialist.
c. Refer any suspected hearing loss to a medical specialist.
d. Two failed screenings at least 6 weeks apart can be referred to California Children’s Services (CCS).

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**Audiometric Screening and Play Audiometry Training**

<table>
<thead>
<tr>
<th>LAST NAME: Doe</th>
<th>FIRST NAME: John</th>
<th>AGE: 15</th>
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PLACE OF SCREENING: Dr. Audio  

**SCORING:**  
Child responds at 25 dB: ✅  
Child does not respond at 25 dB: ⬅️

**AUDIOMETER MODEL:** Ambico

DATE OF LAST CALIBRATION: 11/1/17

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Comments: Recheck in 6 weeks

Referred to: ________________________________

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*Per AAP/Bright Futures Periodicity update February 2017, screen audiometry including 6,000 and 8,000 Hz high frequencies once between ages 11-14 years, once between 13-17 years, and once between 18-21 years.*
Referral & Follow-Up (continued)

- Maintain referral log to track status of the referral
- Follow-up with patient as needed
## Referral Log

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<th>PATIENT'S NAME</th>
<th>D.O.B.</th>
<th>PROVIDER REFERRED TO</th>
<th>SPECIALTY</th>
<th>DATE OF APPT.</th>
<th>DATE CONSULT REC'D</th>
<th>FOLLOW-UP</th>
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<td>02-25-11</td>
<td>Dr. Ear</td>
<td>AU</td>
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**SPECIALTY:**

- P: Pediatrics
- O: Ortho
- G: Gyn
- N: Neurology
- C: Cardiology
- S: Surgery
- D: Dermatology
- E: ENT
- T: Family Plan.
- O: Optometry
- B: GYN/BTL
- R: Radiology
- V: Vascular Surg
- AU: Audiology
- PT: Physical
- U: Ultrasound
- OB: OB
- OP: Ophthal
- GU: Urology
- H: Hema-Oncology
- D: Dentistry

Audiometric Screening and Play Audiometry Training

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## Play Audiometry Demonstration

Audiometric Screening and Play Audiometry Training
Traditional Audiometric Screening
(for patients 7 years and older)

A. Conditioning

1. Screening Preparation
2. Present Beep

A. Conditioning
Step 1: Screening Preparation

1. Position child participant on your dominant side for screening
2. Power ON audiometer
3. Set audiometer to the RIGHT EAR
4. Keep the EARPHONE on the TABLE
5. Set audiometer to 90 dB
6. Set audiometer to 4000 Hz
7. Set audiometer to PULSE TONE
**Conditioning**

**Step 2: Present Beep**

1. Introduce the test
2. Ask patient to listen
3. Press tone for “1 Mississippi”
4. Acknowledge that patient heard the sound (hand raised)

**B. Confirm**

1. Set audiometer to 50db, 4000 Hz
2. Place earphones on patient (red to right ear)
   a. Remove items that impede screening (e.g. glasses, earrings, headbands, etc)
   b. Push back any hair covering the ears
   c. Earphones should be in the middle of the head and in line with the ears
3. Ask patient to listen
4. Press tone
   a. If patient raises hand, start screening
Confirm (continued)

What if the patient does not respond at 50 dB?

1. If patient does not raise hand, switch to the left ear.
2. If patient still does not raise hand, take earphones off and repeat conditioning (steps 1 and 2) and confirm steps (B).
3. If patient does not respond after repeating conditioning (steps 1 and 2), schedule patient for a re-screen in 2-6 weeks.

C. Screening

1. Set audiometer at 20 or 25 dB, 4000 Hz (7-10 years old)
   OR
   Set audiometer at 20 or 25 dB, 8000 Hz (11-21 years old)
2. Confirm ear selector control knob is set to right ear
Screening (continued)
Right Ear
Ages 7-10 years old

Praise patient each time hand is raised (right or left).


Screening (continued)
Left Ear
Ages 7-10 years old

Switch to left ear.
Praise patient each time hand is raised (left or right).


Remove earphones and thank the patient. Document results.
Screening (continued)
Ages 11-21 years old

Screen both ears at 6000Hz and 8000Hz once between 11-14 years old, once between 15-17 years old, and once between 18-21 years old.

Screening (continued)
Right Ear
Ages 11-21 years old

Praise patient each time hand is raised (right or left).

Screening (continued)
Left Ear
Ages 11-21 years old

Switch to left ear.
Praise patient each time hand is raised (left or right).


Remove earphones and thank the patient. Document results.

Screening (continued)
What if the patient does not respond?

If no response to **ANY** of the Hertz (Hz) at 25 dB, proceed to the reconditioning steps and continue screening.
Let’s Review

• Conditioning **(90 dB)** – teaching the child how to play the game
• Screening **(25 dB)** – actual screening
• Reconditioning **(50 dB)** – reminding the child how to play the game
• Documentation – passing (√), non-passing (−)

Thank You!