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Dear Healthy Athletes Program Leader:

Thank you for your commitment to Special Olympics and the health of its athletes. Your efforts make a significant difference in the lives of thousands of people with intellectual disabilities around the world, people who otherwise may not have access to quality health care.

Special Olympics Healthy Athletes® was developed because Special Olympics athletes cannot participate fully in their sport unless they are in good health. And, through research, we have found that people with intellectual disabilities experience a wide array of healthy problems and too frequently fail to receive or are limited in their access to the health care they need.

The purpose of this manual is to provide guidelines for conducting a Healthy Hearing screening. By using this information and resources, you can conduct a successful screening at a Special Olympics competition or other event. Your efforts will be the foundation that establishes the health and learning opportunities that Special Olympics athletes need and deserve. You also will be providing health care providers in your area the opportunity to learn more about working with people with intellectual disabilities, and to experience the joy of being part of the Special Olympics family.

On behalf of Special Olympics athletes everywhere, thank you so much for your interest, enthusiasm and dedication.

Sincerely,

Eunice Kennedy Shriver
Founder and Honorary Chairperson, Special Olympics
WELCOME TO SPECIAL OLYMPICS HEALTHY HEARING PROGRAM

What is Special Olympics Healthy Hearing?
Healthy Hearing is a discipline of Special Olympics Healthy Athletes®, which was initiated in 1996.

Healthy Hearing began in 1998 and is designed for the following purposes:

1. To study the prevalence of hearing loss in athletes competing in Special Olympics events, and to report these findings as a means of highlighting the needs of individuals with intellectual and developmental disabilities
2. To screen the hearing of athletes who participate in Special Olympics events; to notify them, their coaches and others if follow-up care is needed; and, whenever possible, to provide follow-up care on site at Special Olympics events
3. To teach and train students, audiologists, physicians, health care providers and educators about hearing loss and ear health problems in individuals with intellectual and developmental disabilities, and about solutions to these problems

What is hearing and hearing loss?
Normal hearing is a person’s ability to hear a range of very soft to very loud sounds containing low to high frequencies (see figure 1). The sounds of speech are most important for human communication, and of course are vital to Special Olympics athletes’ ability to hear and understand coaches’ and officials’ directions and instructions.

Hearing loss is the inability to hear soft to loud sounds across a range of frequencies. A hearing loss can make sounds too soft for the listener to understand speech consistently. If the loss is severe, the listener may not hear sounds at all.

Figure 1:
Frequency spectrum of familiar sounds plotted on a standard audiogram. Shaded area represents the “speech banana” that contains most of the sound elements of spoken language.

Reprinted with permission from Lippincott, Williams and Wilkins, 2005
Hearing loss can be temporary or permanent, depending on its cause and location in the ear (see figure 2). A temporary loss can be caused by excessive earwax in the outer ear canal or congestion in the middle ear (the space behind the eardrum) due to infection. This is called conductive hearing loss because sound is not conducted efficiently from the outer to the inner ear. A permanent loss, referred to as sensorineural loss, can result from viral and bacterial infections, very loud sounds, heredity reasons, syndromes, medications and a number of other factors. It causes damage to the inner ear’s sensory structures or the nerve of hearing that connects the inner ear to the brain. A conductive loss makes sounds too soft to hear comfortably. A sensorineural loss does the same, but often makes sounds unclear as well, no matter how loud.

Figure 2: Anatomy of the ear.

Reprinted with permission from CIBA-GEIGY, 2001

How is hearing acuity measured?
Hearing acuity can be measured on a decibel (dB) intensity scale from 0dB (no hearing loss) to 110dB (maximum hearing loss), based on normative study data. Threshold values are usually assessed for specific test frequencies that range from low to high (125 hertz (Hz) through 8000 Hz). Pure tone audiometers, calibrated for intensity and frequency, are used to measure hearing acuity. Some audiometers also permit the evaluation of a hearing threshold for speech based on normative data. Threshold measurements for pure tones and speech require extremely quiet surroundings, often prefabricated test rooms meeting specific standards for noise reduction.
What is hearing screening?

Hearing screening can be accomplished much faster than threshold hearing testing, often in ordinary rooms that are reasonably quiet as opposed to the extreme quiet required for threshold testing. The swiftness of screening allows large numbers of people to be screened in a relatively short time. It is an efficient way to identify people who may have hearing losses and therefore require referral for diagnostic audiological evaluations under clinical conditions, and/or medical examinations for ear health issues. Most public school systems in the United States, for example, conduct hearing screening programs early in the school year to quickly identify children who may be experiencing listening difficulties, and to prevent learning problems by providing follow-up diagnostic testing and/or medical treatment. This public health model of prevention is the fundamental concept of Healthy Hearing: screen, identify and refer.

Screening of hearing is accomplished by testing a person’s hearing for pure tones within a prescribed test frequency range, usually 500 through 4000 Hz (ASHA, 1997). An intensity level is set above the normal hearing threshold of 0 dB, referred to as 0 dB Hearing Level (HL), and each frequency is tested at only that level. Most often 25 dB HL is selected as the screening level. If a person can hear each test tone at this HL, usually giving the behavioral response of raising a hand, then hearing thresholds are considered normal and that person should have no difficulty listening to the speech of others.

Evoked otoacoustic emissions (EOAE) technology is another method for screening hearing. It is an electrophysiological method of assessing the integrity of the inner ear's sensory outer hair cells. Its widespread use for newborn screening is recommended (Joint Committee on Infant Hearing, 2000; NIDCD, 1993; Norton, Gorga, Widen et al., 2000; White, Vohr and Behrens, 1993) and it can be used with children and adults as well (Robinette and Glattke, 2002). It measures objectively (i.e., without behavioral indication) the response of the inner ear to calibrated sounds transmitted to it by a probe microphone placed in the outer ear canal. The person does not need to raise a hand to indicate hearing the tone, since the EOAE technology records/reports the response of the inner ear sensory mechanism. The EOAE technology screening level and test frequency range are essentially the same as for pure tone screening. Therefore, the Pass-Refer conclusions for a person passing or not passing are the same.

How does Healthy Hearing screen/test athletes?

Athletes go to a registration desk, four screening stations, and a check-out desk. Athletes may go to a fifth station for pure tone threshold testing, if they did not pass the pure tone screening, and if threshold testing is available at the event. The specific procedures at each station are described later in this manual. Athletes’ results at each station are recorded on a specific form (described later in this manual). Most athletes require only the first two screens.

The first screening station examines ear canals for the presence of cerumen (earwax); the second conducts an EOAE screening of each ear. An athlete who passes the second station's screen goes to the Healthy Hearing check-out desk, turns in the Healthy Athlete Screening Form, receives the Healthy Hearing Screening Summary Results Form (see appendix), and gets an appreciation gift.
An athlete who does not pass the EOAE screen goes to the third station for tympanometry (middle ear screening) and then the fourth station for pure tone screening. Tympanometry instrumentation objectively screens for middle ear conditions that may result in conductive hearing loss, and thus may explain why the athlete did not pass Station 2’s EOAE screen. Station 4’s pure tone screen serves to confirm the EOAE screening outcome. An athlete who completes the fourth screen then proceeds to the check-out desk and receives a copy of the Healthy Hearing Screening Summary Results Form if a pass is indicated, or the Screening Follow-up Recommendations Form if the athlete did not pass, and receives a gift.

When pure tone threshold testing is available at a Special Olympics event, all athletes who do not pass the pure tone screen at Station 4 proceed to Station 5. At this station, which may be away from the screening site, air- and bone-conduction thresholds will be tested to determine the type of loss (conductive or sensorineural), the extent of threshold loss (mild, moderate or severe) and the potential hearing aid and/or medical treatment needs of the athlete. Athletes completing Station 5 go to the check-out desk, receive either the Screening Summary Results Form or the Pure Tone Threshold Test Results/Recommendations Form (based on results from threshold testing), and receive a gift.

Healthy Hearing also may provide noise protection universal earplugs or make custom-fitted earplugs for athletes. Although not screening methods, these earplugs are important to Healthy Hearing’s goal of preventing hearing loss caused by exposure to loud sounds, particularly for athletes listening to very loud music. Therefore, a sixth station may be available to dispense or make custom-fitted earplugs. This same station may be used to make swim plugs for athletes who participate in water sports or activities. Swim plugs for each ear can prevent water from going into ear canals, and are especially useful to athletes who have ventilation tubes or perforations in their eardrums.

**Who does the Healthy Hearing screening/threshold testing?**
Immediately before a Special Olympics event, audiologists train volunteers to conduct the screening/threshold testing. Most volunteers are audiologists, speech-language pathologists, special educators or graduate students in these disciplines. Healthy Hearing volunteers at each event are supervised by a certified or licensed audiologist in countries or states where such credentials are required. When that is not the case, Healthy Hearing clinical directors from other professional disciplines supervise Healthy Hearing activities.

**How many volunteers are needed at each event?**
Large events with 500 or more athletes require at least 24 volunteers a day, in addition to the Healthy Hearing clinical director, to work at the stations (described in later sections of this manual). Two are required at registration, two at check-out, four at external ear canal inspection, four at evoked otoacoustic emissions screening, four at tympanometry screening, four at pure tone screening, and four at pure tone threshold testing. Twelve to fourteen volunteers can manage smaller events.
What information is provided to the athlete?
The Healthy Athletes Screening report form (see appendix) is used to record the Pass or No Pass screening results for an athlete’s right and left ears at each station. A section of the form is available to make recommendations, record notes concerning the athlete and record the services provided to the athlete. Each athlete brings the form to the Check-Out desk after completing all necessary stations. A supervising audiologist or the event’s Healthy Hearing clinical director will review and sign the athlete’s HAS form, and provide the athlete with an appropriate report form (the Screening Summary Results Form, the Screening Follow-up Recommendations Form or the Pure Tone Threshold Test Results/Recommendations Form) before the athlete leaves the Healthy Hearing area. Also, before the athlete leaves the area, the coach or person accompanying each athlete who did not pass hearing screening or threshold testing receives an explanation of results and recommendations.

How long does the screening take?
The entire process from registration to check-out takes approximately eight minutes per athlete. It takes longer, possibly five minutes more, if results of the EOAE screening require the athlete to be checked with tympanometry and pure tone screening. Pure tone threshold testing takes another eight minutes. Athletes typically arrive together as state, regional or country teams, accompanied by their coach(es). They usually wait for each other to finish the screening, and leave as a group. Although it is supportive for the athletes to watch each other being screened, the process can slow down, get backed up or become noisy when 10 to 15 athletes are waiting at various stations.

Some athletes may want noise protection earplugs. The universal-use type can be given to each athlete, along with instructions about their use, in several minutes. If custom earplugs are made for an athlete, another eight minutes will be required. Athletes may come back for this fitting at another time during the event. Swim plugs also can be made in about eight minutes, and athletes may come back during the event to have them made, too.
1. As a volunteer, you should smile, look at the athlete, greet the athlete with your first name, and say that you need to fill out a short form. The information on the athlete’s Healthy Athlete Screening (HAS) Form needs to be filled out accurately and legibly.

2. Begin by obtaining identifying information about the athlete as indicated below. The athlete may be wearing a badge, a Special Olympics passport or an armband that contains most of this information.

   **Name:** First name, then last
   **Age:** In years
   **Gender:** Please circle male or female, since many times the badge does not indicate gender.
   **State/Country:** For the World Games or Multinational Games, please indicate the state (USA) or country. For local, U.S. state or country Games, please identify the country or other identifying locality.

3. Note on the form if the athlete has an ear anomaly, is wearing a hearing aid (note which ear) or if the athlete or the coach indicates a previously known hearing loss, and in which ear.

4. Give the athlete the filled-out HAS form.

6. Tell the athlete that he/she is now ready to begin the hearing screening. Direct or guide the athlete to the first station, which is external ear canal inspection.

7. Walk the athlete over to the station or a waiting area, or ask a volunteer to assist you.

**Equipment and materials needed**

- One or two six-foot tables
- Two to four chairs for volunteers
- A Special Olympics Healthy Hearing banner or large signs to indicate “Healthy Hearing”
- Pens and pencils
- Official HAS Healthy Hearing forms (available on the Special Olympics Web site). Always have available 100 more forms than the number of athletes expected to be screened.
Consent/assent to participate in Healthy Hearing screening is arranged by Special Olympics. The legal guardian already signed an informed consent when the athlete was registered for the Games before the screening. As a volunteer, you need to know, and must be able to impart, the consent/assent for hearing screening/testing in this program, as follows:

1. Explain to the athlete, coach, or accompanying person that the athlete is being asked to be a part of the hearing screening program that studies the hearing needs of Special Olympics athletes and provides each athlete with a report of his/her hearing status. The information also helps Special Olympics understand if people with intellectual disabilities are able to get the hearing care they need and deserve.

2. Explain to the athlete (and his coach or caregiver) that by participating in the screening program, they agree to the following:
   
a. Healthy Hearing is not a complete hearing examination, and they are responsible for any follow-up hearing care.

   b. Information from the screening/test results and other pertinent information will be reviewed and/or used for research, education or other professional purposes. Confidentiality will be maintained at all times.

   c. Volunteer screeners will explain each screening technique and its purpose to the athlete.

3. Present the information to the athlete and allow him/her to ask questions.

4. Ask the athlete if he/she understands the information and if he/she has any questions. An athlete who understands and has no questions may proceed to the first station.
HEALTHY HEARING DAILY PROTOCOL AND TASKS

Screening Sequence

Station 1  External Ear Canal Inspection
Station 2  Evoked Otoacoustic Emissions (EOAE) Screening
Station 3  Tympanometry (Middle Ear) Screening
Station 4  Pure Tone Hearing Screening
Station 5  Pure Tone Hearing Threshold Testing

Daily Tasks

1. Always use nonlatex gloves when screening; change after every athlete.
2. Take a clean otoscope speculum from a plastic container marked “Clean.”
3. Put the used speculum in a plastic container marked “Dirty.”
4. Clean specula in sonic cleaning unit with fluid for a 15-minute cleaning cycle; drain cleaning unit; let specula stand awhile to dry; return them to Clean container.
5. If using disposable specula, throw them away after use.
6. Throw away EOAE (AuDX-1) tips after use.
7. Keep clean tympanometry tips in container marked “Clean.”
8. Put dirty tympanometry tips in container marked “Dirty.”
9. Repeat cleaning instructions for tympanometry tips per task 4.
10. Reuse cleaned tympanometry tips daily; DO NOT THROW AWAY.
11. Use ultraviolet light for five to ten seconds on audiometer headphones and headband after each athlete is screened for pure tones, and after threshold testing.
12. Follow the recommended hydration procedures for volunteers throughout the event day.
<table>
<thead>
<tr>
<th>Date</th>
<th>O Male</th>
<th>O Female</th>
<th>DoB</th>
<th>Age (years)</th>
<th>O Not Sure</th>
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</thead>
<tbody>
<tr>
<td>Event Location</td>
<td>O Athlete</td>
<td>O Unified partner</td>
<td>Sport</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delegation</td>
<td>SO Program</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Station 1: Ear Canal Screen**  
O First  
O Second Ear Canal Screen after Cerumen removal

<table>
<thead>
<tr>
<th>Screener’s Name</th>
<th>(print)</th>
</tr>
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</table>

**Station 2: Otoacoustic Emissions Screen**

<table>
<thead>
<tr>
<th>Screener’s Name</th>
<th>(print)</th>
</tr>
</thead>
</table>

**Station 3: Tympanometry Screen**

<table>
<thead>
<tr>
<th>Screener’s Name</th>
<th>(print)</th>
</tr>
</thead>
</table>

**Station 4: Pure Tone Screen at 25dB Hearing Level (2000Hz)**

<table>
<thead>
<tr>
<th>Screener’s Name</th>
<th>(print)</th>
</tr>
</thead>
</table>

**Station 4: Pure Tone Screen at 25dB Hearing Level (4000Hz)**

<table>
<thead>
<tr>
<th>Screener’s Name</th>
<th>(print)</th>
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</thead>
</table>
### Station 5: Pure Tone Threshold Test

Tester’s Name (print)

☐ Threshold Testing Done

#### Test Frequencies

<table>
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<th></th>
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<th>2000</th>
<th>3000</th>
<th>4000</th>
<th>8000</th>
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<tr>
<td>Right</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bone-Conduction*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*without masking  Key: D = Did Not Test  C = Could Not Test

#### Type of hearing loss, and degree of loss using better ear:

- O Bilateral Sensorineural Hearing Loss
  - O Mild
  - O Moderate
- O Unilateral Sensorineural Hearing Loss
  - O Mild
  - O Moderate
- O Bilateral Conductive Hearing Loss
  - O Mild
  - O Moderate
- O Unilateral Conductive Hearing Loss
  - O Mild
  - O Moderate
- O Mixed Bilateral Hearing Loss
  - O Mild
  - O Moderate
- O Mixed Unilateral Hearing Loss
  - O Mild
  - O Moderate
- O Normal Hearing

#### Services Provided At The Event

- ☐ Ear Canal Inspection
- ☐ Hearing Screening
- ☐ Middle Ear Screening
- ☐ Hearing Threshold Testing
- ☐ Hearing Aid Repair/Maintenance
- ☐ Ear Mold for Hearing Aid Right
- ☐ Ear Mold for Hearing Aid Left
- ☐ Hearing Aid Right
- ☐ Hearing Aid Left
- ☐ Noise Earplug Right
- ☐ Noise Earplug Left
- ☐ Swim Plug Right
- ☐ Swim Plug Left
- ☐ Counseling Athlete/Coach/Other
- ☐ Report to Athlete/Coach/Other
- ☐ Brochure Hearing Loss Athlete
- ☐ Brochure Hearing Loss Coach/Other
- ☐ Brochure Noise Athlete
- ☐ Brochure Noise Coach/Other

#### Recommended Follow-up Care

- ☐ Cerumen Removal
  - O Right
  - O Left
  - O Both
- ☐ Medical evaluation of ears
- ☐ Audiological evaluation of hearing
- ☐ Ear molds for hearing aid use
- ☐ Hearing aid evaluation and fitting
- ☐ Hearing aid orientation program
- ☐ Aural rehabilitation program including auditory training and speech reading
- ☐ Noise Earplugs
- ☐ Swim Plugs

### Comments

---

Signature of HH Clinical Director

Print Name of HHCD
Station 1
EXTERNAL EAR CANAL INSPECTION

Instrumentation: Otoscope, speculum and gloves

Position: Athlete is seated next to the table. Screener stands.

Procedure for verbal or nonverbal athlete:

1. Explain to the athlete that this procedure will look at the health of the ear canal.
2. Shine the otoscope light on your hand to show the athlete what you will be doing.
3. Ask the athlete to look straight ahead and sit still.
4. Gently pull the outer ear (pinna) back and up while inserting the otoscope’s tip (speculum) in the ear canal.
5. Look into the ear canal.
6. Note if the canals are blocked or partially blocked with cerumen, or are clear.

Record: Print your name in the appropriate block on the HAS form. On the form, check if this is the athlete’s first screen or second screen after cerumen removal, and check if the ear canal is clear, partially blocked or blocked in the right and left ear, respectively. If you see something unusual, alert the clinical director and decide if a notation in the Comments section of the form is warranted. If appropriate, check one of the options in the “Follow-up Needed” section.

Equipment needed for 300 athletes over a five-hour day

- Two six-foot tables
- Four chairs for athletes
- Four otoscopes*
- 100 nondisposable specula, all sizes; if disposable, have sufficient supply for the number of athletes to be screened
- Nonlatex gloves
- Supply of batteries for each otoscope

* If the otoscopes have a rechargeable battery handle, recharge before using. Always have several back-up recharged handles available to replace others that need recharging during an event.
Station 2
EVOKE OTOACOUSTIC EMISIONS SCREENING

Screening: Hearing at 2000, 3000, 4000 and 5000 Hz

Instrumentation: Bio-logics Systems Corporation, Model AuDX-1, distortion product otoacoustic emissions screener

Position: Athlete should be seated next to the table.

Procedure for verbal or nonverbal athlete:

1. Explain to the athlete that the procedure will screen his/her hearing. Ask the athlete to sit quietly.

2. Show the athlete the ear probe and note that it is soft and will fit comfortably at the edge of the ear canal. DO NOT SAY, “This won’t hurt.”

3. Gently squeeze the ear probe’s soft tip and place it in the ear canal, and follow the instructions on the next page.

Record: Print your name in the appropriate block on the HAS form, and check Pass or No Pass for each ear.

Pass or Refer (i.e., No Pass) decision: If the AuDX-1 indicates Pass in each ear, the athlete is directed to the check-out desk and is finished. If Refer is indicated in one or both ears, the athlete is directed to tympanometry screening at Station 3. Before sending an athlete to Station 3, it is recommended that you remove and reinsert the ear probe and repeat the EOAE screen; and then proceed as indicated for Pass or Refer.

Equipment needed for 300 athletes over a five-hour day

- Two six-foot tables
- Three chairs per table for athletes
- Six AuDX-1 EOAE screeners
- 400 disposable ear tips, two sizes (adult and child); 100 per bag (three bags adult, one bag child)
- Pens, pencils
- Trash bags taped to the tables to collect used ear tips
HEALTHY HEARING  
HEARING SCREENING USING AuDX-1

To start the day:


You are ready to screen.

1. Push Select. “Test R EAR” will appear. You are ready to screen the right ear.

2. Choose an ear tip and insert it over the probe tip so that the ear tip’s plastic tube is flush against the ear probe wall.

3. Clip the probe assembly to an article of the athlete’s clothing to secure it.

4. Shape the sponge ear tip to fit the ear canal; insert it into the right ear canal.

5. Press Select again to screen the right ear.

6. Do nothing else until the test ends, and results are shown as either Pass or Refer (i.e., No Pass). If Refer appears, it is recommended that you remove and reinsert the ear probe and repeat the EOAE screen.

7. Check Pass or No Pass on the HAS form, depending on the AuDX-1 outcome.

8. Ignore the “View Results” prompt on the screen.

9. Switch probe tip to the left ear.

10. Press Restart, then press Select, then press the down V so that L appears on the screen, and then press Select again to screen the left ear.

11. Check Pass or No Pass on the HAS form, depending on the AuDX-1 outcome.

12. If you are unable to complete the screening, indicate the reason by checking one of the options from the list on the HAS form.

13. Throw away the ear tip. You are now finished screening the athlete.

14. Press Restart to screen the next athlete, and follow steps 1–13 again.

Cautions:
Always handle the probe assembly unit with care. Do not drop it or toss it on the table. Place it very gently on the table after using it.

If the probe tip has cerumen blocking it, contact the Healthy Hearing clinical director so it can be cleaned for reuse, or clean it yourself if you have been instructed how to do so.


Station 3
TYMPANOMETRY SCREENING

Screening: The response of the eardrum (tympanic membrane) and middle ear system to pressure changes introduced into the outer ear canal

Instrumentation: Grason-Stadler Viasys Healthcare Corporation, Model GSI 37 Tympanometer

Position: Athlete should be seated next to the table.

Procedure for verbal or nonverbal athlete:

1. Seat the athlete beside the table.

2. Tell the athlete you are going to check how well sounds can pass through his/her eardrum.

3. Show the athlete the tympanometer. Explain that you will place its tip against the ear canal.

4. Tell the athlete to sit quietly, and that you will be done in a few seconds.

5. Follow the instructions on the next page.

Record: Print your name in the appropriate block on the HAS form, and check Pass or No Pass for each ear.

Pass or No Pass decision: If No Pass is indicated, check on the HAS form that an ear exam is recommended. If the screening could not be completed, indicate the reason by checking one of the options from the list on the HAS form. In either case, direct the athlete to the pure tone screening at station four.

Equipment needed for 300 athletes over a five-hour day

- Two six-foot tables
- Four chairs for athletes
- Four tympanometers
- 200 probe tips, various sizes, reusable
- Pens
- Nonlatex gloves
- Probe tip sonic cleaner and designated cleaning fluid
Healthy Hearing
Tympanometry Using GSI 37

1. Select the probe tip to fit the ear canal size; insert it on the metal tip of the tympanometer so that its back is flush with the rear of the metal tip.

2. Place the tip of the tympanometer gently but firmly at the opening of the ear canal.

3. Push the L button and put the probe into the left ear canal.

4. Look for the inverted V symbol in the box; if present, record as Pass Left. If the symbol is out of the box to the left or a flat line appears, record as No Pass Left.

5. Push the R button and put the probe into the right ear canal. If the inverted V symbol appears in the box, record as Pass Right. If not, per #4 above, record as No Pass Right.

6. If you have any questions, ask the clinical director.

7. If you have no questions, press 1M2 then M- to clear Memory for the left ear. Then repeat this step to clear Memory for the right ear.

8. Remove the probe tip and place it in the Dirty container for cleaning. You are now ready to test the next athlete.
Station 4
PURE TONE SCREENING

Screening: Hearing at 2000, 4000 Hz at 25dB HL

Instrumentation: Pure tone audiometer with air-conduction earphones

Position: Athlete and screener should be seated on the same side of the table. The athlete may face the screener as long as the athlete cannot see the front of the audiometer or the screener’s fingers depressing the audiometer’s interrupter key.

Procedure for a verbal or nonverbal athlete:
1. Ask the athlete to must sit still, listen carefully to very quiet tones, and raise his/her hand whenever he/she hears a tone. Training is recommended, as described below.

2. Place earphones on the athlete, making sure they cover the ears completely, the pinna is not folded over or pinched and there is a good seal.

3. Begin by presenting a “training” tone at the 50 dB HL to be sure the athlete hears it and knows the behavioral response (i.e., raise hand).

4. Ask someone to assist you with the training if this is not successful.

5. Try a higher training tone of 60 or 70dB HL if an athlete does not respond at 50dB HL.

6. Once the athlete demonstrates understanding of the procedure and the expected response, screen one ear, then the other. Present the tones at 2000 and then 4000 Hz at 25dB HL to each ear.

7. If the athlete does not respond at the 25dB HL screening level test frequency, mark the result No Pass.

Record: Print your name in the appropriate block on the HAS form, and check Pass or No Pass for each ear.

Pass or No Pass decision: The athlete is referred for further audiological evaluation if the results show a No Pass at any test frequency in either ear. The athlete is finished with the Healthy Hearing screening after completing this station if a Pass is achieved at each test frequency in each ear, and is directed to the check-out desk.
However, if the decision is No Pass and there is a Station 5 (pure tone air- and bone-conduction threshold testing), send the athlete to Station 5 for testing. If there is no Station 5 at an event, you may choose to do a pure tone air-conduction threshold audiogram for the right and left ears at 1000, 2000, 4000 and 8000 Hz and record the results on the athlete’s HAS form (see instructions for Station 5.) This decision is made on an individual basis in consultation with the Healthy Hearing clinical director.

**Note:** Always use the ultraviolet light to clean the earphone cushions and headband after screening each athlete.

**Equipment needed**
- Two six-foot tables
- Eight chairs (for athletes and volunteers)
- Four audiometers/headphone sets
- Ultraviolet light
- Pens
- Nonlatex gloves
Station 5
PURE TONE THRESHOLD TESTING

Evaluation of: Hearing acuity for air- and bone-conduction pure tones at 1000, 2000 and 4000 Hz, and air-conduction at 8000 Hz

Instrumentation: Pure tone audiometer with air-conduction headphones and bone-conduction vibrator

Position: The athlete and screener should be seated on the same side of the table. The athlete may face the screener as long as the athlete cannot see the front of the audiometer or the screener's fingers depressing the audiometer's interrupter key. Testing is conducted in a portable testing booth or a very quiet room away from the screening area. The booth is available upon request.

Procedure for verbal or nonverbal athlete:
1. Ask the athlete to sit still, listen carefully to very quiet tones and raise his/her hand whenever he/she hears a tone. Training is recommended as described below.

2. Place earphones on athlete, being sure they cover the ears completely, and that the pinna is not folded over or pinched, and there is a good seal.

3. Begin by presenting several training tones at 70dB HL and then at 60dB HL to be sure the athlete hears it and knows the behavioral response required (raise hand).

4. Ask someone to assist you with the training if this is not successful.

5. Once the athlete demonstrates understanding of the procedure and the response expected, decrease the tone's intensity in 15dB steps, seeking a response at each step. Once the athlete does not respond, increase the intensity in 5dB steps until the athlete responds. At that point, reduce the tone's intensity by 15dB and seek a response at successively louder 5dB steps. Repeat this procedure until you achieve two out of three responses at a particular hearing level.

Vary the rhythm of presenting the tone by depressing the interrupter switch in no set pattern; that is, do not present each tone at regular intervals of, for example, three seconds. DO NOT let the athlete see your hands as you depress the interrupter switch to present the tone.

6. Follow the steps described in #5 for air-conduction tones of 1000, 2000, 4000 and 8000 Hz in the right and left ears. Follow these same steps for bone-conduction tones of 1000, 2000, and 4000 Hz by placing the bone-conduction vibrator on the mastoid process behind the right ear.

There is no need to repeat the bone-conduction testing by placing the vibrator on the left ear's mastoid process.
7. Do all threshold testing as rapidly as possible to maintain the athlete's interest and compliance. It may be necessary for two testers to work as a team, with one training the athlete how to respond and sustain the response, and the other presenting the tones from the audiometer.

**Record:** Print your name in the designated block for pure tone threshold test results on the HAS form. Record the pure tone air-conduction threshold results for the right and left ears at each test frequency in the designated block. Record the pure tone bone-conduction threshold results for 1000, 2000 and 4000 Hz where designated on the HAS form as well.
**DECISIONS FROM PURE TONE THRESHOLD RESULTS**

At the check-out table, before the athlete leaves, the event’s supervising audiologist or the Healthy Hearing clinical director must review each athlete’s pure tone threshold results. He/she will decide the type and degree of hearing loss (see below), and record that decision, as well as the recommended follow-up care needed by the athlete and the services provided at the event to the athlete (see below), on the HAS form.

**Designations for type and degree of hearing loss, recommended follow-up care, and services provided at the event.**

The following are the choices for type of hearing loss and degree of loss using better ear results on the HAS form:

1. **Bilateral Sensorineural Hearing Loss**
   - Mild
   - Moderate
   - Severe

2. **Unilateral Sensorineural Hearing Loss**
   - Right
   - Left
   - Mild
   - Moderate
   - Severe

3. **Bilateral Conductive Hearing Loss**
   - Mild
   - Moderate
   - Severe

4. **Unilateral Conductive Hearing Loss**
   - Right
   - Left
   - Mild
   - Moderate
   - Severe

5. **Mixed Bilateral Hearing Loss**
   - Mild
   - Moderate
   - Severe

6. **Mixed Unilateral Hearing Loss**
   - Right
   - Left
   - Mild
   - Moderate
   - Severe

7. **Normal Hearing**
   - Right
   - Left
   - Both

*These designations will involve tympanogram outcomes as well, since masking procedures will not be used.

The following are the choices for recommended follow-up care on the HAS form:

- Cerumen removal: Right Left Both
- Medical evaluation of ears
- Audiological evaluation of hearing
- Ear molds for hearing aid use
- Hearing aid evaluation and fitting
- Hearing aid orientation program
- Aural rehabilitation program including auditory training and speech reading

The following are the choices for services provided at the event to the athlete on the HAS form:

- Ear Canal Inspection
- Hearing Screening
- Middle Ear Screening
- Hearing Threshold Testing
- Hearing Aid Repairs/Maintenance
- Ear Mold For Hearing Aid Right
- Ear Mold For Hearing Aid Left
- Hearing Aid Right
- Hearing Aid Left
- Noise Earplug Right
- Noise Earplug Left
- Swim Plug Right
- Swim Plug Left
- Counseling Athlete/Coach/Other
- Report to Athlete/Coach/Other
- Brochure Hearing Loss Athlete
- Brochure Hearing Loss Coach/Other
- Brochure Noise Athlete
- Brochure Noise Coach/Other
REFERRING THE ATHLETE FOR FOLLOW-UP SERVICES

Each athlete’s Healthy Hearing screening data and hearing threshold test results, if obtained, are recorded on the HH HAS form. The HAS form is the Special Olympics state or country’s permanent record of the athlete’s HH results.

Referral recommendations for an athlete (taken from his/her HH HAS form) are recorded on a specific form at the check-out desk (see next section) and given to the athlete, coach and/or accompanying person. Two referral forms are available for recommendations, depending on the HH procedures accomplished: the Screening Follow-up Recommendations form for athletes who do not pass hearing screening procedures, and the Pure Tone Threshold Test Results/Recommendations form for athletes completing hearing threshold testing (see appendix for these forms). The supervising audiologist or the event’s clinical director can answer questions from the athlete or coach at the time referral recommendations are made and can provide any counseling needed at that time.

The referral criterion for follow-up services from Healthy Hearing screening (Stations 1 through 4) is not passing the pure tone screening (25dB HL at 2000 Hz and 4000 Hz) in one or both ears at any frequency. In addition, results from Station 1 may indicate follow-up recommendations due to the presence of excessive external ear canal cerumen.

Further, a referral for follow-up services may be initiated based on the tympanometry results (Station 3), regardless of the pure tone screening outcome (Station 4). This decision for an athlete will be made by the Healthy Hearing clinical director, possibly based on the incidence of middle ear disease in a particular geographic area and/or for an athlete population known to have a high incidence of middle ear problems.

In some instances at an event, immediate referral may be necessary. This circumstance occurs, for example, if an athlete reports pain in the ear or has an obvious problem requiring immediate medical attention. The Healthy Hearing clinical director or supervising audiologist will manage each such referral in consultation with the Special Olympics medical personnel at the event.
CHECK-OUT

Before the athlete leaves the Healthy Hearing area following screening / threshold testing, do the following:

1. Be sure a Pass is recorded for each ear at Station 2 (EOAE) if the athlete is checking out following screening at Stations 1 and 2. If so, HH volunteers at the check-out desk can sign the HH HAS form and put it in its designated place; clearly print the athlete’s name on the HH Screening Summary Results form, mark its “Congratulations” box, and give it to the athlete. Note: If the athlete’s HAS form has follow-up recommendations for Station 1 (external ear canal inspection) even though he/she passed Station 2, the volunteer needs to check the appropriate box on the Screening Summary Results form as well. If the volunteer has any questions, he/she must contact the supervising audiologist before the athlete leaves the HH area.

2. If an athlete was sent to Stations 3 and 4, be sure a No Pass is recorded on the HAS form for one or both ears at Station 2 (EOAE). Be certain a Pass or No Pass is recorded on the HAS form for each ear at screening Stations 3 and 4. If No Pass is recorded for either ear at Stations 3 and 4, the supervising audiologist or clinical director must review the athlete’s HAS form results (including any recommendations from Station 1), complete the form’s recommendations and services provided sections, sign the form, and complete the HH Screening Follow-up Recommendations form, which is then given to the athlete. The supervising audiologist/clinical director will answer any questions and counsel the athlete and/or coach when the HH Screening Follow-up Recommendations form is completed.

3. Be sure that air- and bone-conduction threshold data are recorded on the HAS form if the athlete is tested at Station 5 (pure tone threshold testing). The supervising audiologist/clinical director must review these data (including any recommendations from Station 1) and complete the following sections on the athlete’s HAS form: type and degree of hearing loss, recommendations for follow-up care and services provided at the event. The supervising audiologist/clinical director then signs the HAS form, completes the Pure Tone Threshold Test Results/Recommendations form, gives it to the athlete and answers questions or provides counseling.

4. Be sure no station has been missed and all sections of the HAS form have been completed.

5. If a station’s results are not clear, ask the screener (see printed name for that station) to review or complete the results.

6. If the volunteer at the check-out desk is not sure of the recorded results, check with the supervising audiologist or clinical director for clarification.
SHARING RESULTS WITH THE ATHLETE

Keep the completed HAS form. Give the appropriate Healthy Hearing report form (see steps 1–3 above) to the athlete. Explain the results/recommendations to the athlete’s coach or accompanying person (see steps above). If you plan to refer the athlete to another professional and thus share the athlete’s Special Olympics event findings, it is necessary to get a signed consent at the time of the event or thereafter before releasing the athlete’s information (see Appendix, Authorization to Release Healthy Hearing Information.

If noise protection earplugs or swim plugs are available at an event, ask the athlete if he/she would like to have earplugs to protect his/her hearing from very loud sounds or to have swim plugs for use when swimming (also explain this to the coach or accompanying person). If so, direct the athlete to that station. If not, explain that the athlete may come back for noise earplugs or swim plugs at another time during the event. Noise earplugs and swim plugs can be made only if the ear canals are completely clean of wax and debris. Universal ready-to-use noise protection earplugs also may be available at an event, so making personalized earplugs may not be necessary.

Give the athlete each type of Healthy Hearing brochure. Also, give the athlete an appreciation gift for completing the Healthy Hearing Program, and emphasize the importance of routine ear hygiene and hearing health care. Smile, and wish the athlete well in his/her sports event!

On the basis of the results, place the HAS form in either the Pass or No Pass box so that its data can be entered onto the HH Data Tabulation form. Also, group separately the copies of each type of report form given to athletes to enable follow-up after the Games.

Equipment and materials needed
- Two six-foot tables
- Two to four chairs for volunteers
- Boxes to collect forms; label one Healthy Athlete Screening box, Pass, and the other, No Pass; and have three other boxes for the three different report forms (see below).
- Pens, pencils
- Gifts designated for athletes
- Supply of three different report forms (assumes 500 athletes screened)
- 400 Screening Summary Results
- 200 Screening Follow-up Recommendations
- 200 Pure Tone Threshold Test Results/Recommendations
Earplugs to protect athletes’ hearing from excessively loud sounds, and swim plugs may be provided at some Special Olympics Healthy Hearing events. The noise earplugs are two types: universal (one size fits all) and custom made. The swim plugs are custom made.

The universal-type noise protection earplugs can be given to the athlete after it is determined that they fit comfortably in the athlete’s ear canals. The athlete must be instructed how to put in and take out the earplugs, when to use them and where to keep them in a safe but convenient place when not in use. Each athlete will be given the Healthy Hearing Noise Protection brochure.

The following information is to assist in creating a pair of custom-made noise earplugs and/or swim plugs for the athlete if he/she wishes. Noise earplugs/swim plugs can be made only if the ear canals are completely clean of wax and debris.

**Noise protection earplugs/swim plugs are made using kits of ear mold material, as follows:**

1. Using a special small penlight, guide a very small cotton ball with a string attached down the ear canal just past its first turn. The string lies from the cotton ball to outside the ear canal.

2. Mix ear mold paste with a hardener substance, and place the mixture in a syringe (red mixture for right ear, blue mixture for left ear).

3. Inject the mixture from the syringe into the ear canal and part of the outer ear shell or concha.

4. Using your fingers, form the mixture so the entire ear canal is blocked.

5. After five to seven minutes, the earplug has set and can be removed.

6. Cut the cotton and its attached string from the earplug tip.

The earplug is ready to be worn immediately.

**Equipment needed**

- Set of earplug material and supplies from ear mold manufacturers
- Plastic bags and ID tags for plugs
- List to keep track of each athlete’s name and number of earplugs made (i.e., right and/or left ear)
The outcome data on each athlete’s completed Healthy Hearing HAS form must be tallied on the Healthy Hearing Data Tabulation Form* before the HAS form goes to the state or country Healthy Athletes office. This data entry step can be accomplished during the event or at the conclusion of the event. Two procedures are essential to fulfill this responsibility: 1) keep all completed Healthy Athlete Screening forms in a safe place throughout the event and 2) enter the data for each athlete before relinquishing all HAS forms. The Data Tabulation form summarizes the findings of all the athletes screened and provides overview results for a Healthy Hearing event. Individual athlete results are preserved on the athlete’s Healthy Hearing HAS form.

The overview results (in the format of the Data Tabulation form) must be e-mailed immediately to pierce105@chapman.edu so they can be merged with all other worldwide Healthy Hearing data. Again, individual athlete results are retained on the HAS form for use in the future follow-up needs of the athlete. These are confidential records and can be shared only with permission (signed consent) from the athlete or his/her legal caregiver.

*The Data Tabulation form is an Excel worksheet that accepts tallies of athletes' screening data and automatically provides summary findings for a Healthy Hearing event. The Data Tabulation form requires a “paper-pencil” summary of the same HAS data points of all the athletes, followed by insertion of the respective sums into the Data Tabulation form, which is available at the Special Olympics Web site. It is recommended that a printed copy of the form be downloaded and filled out before the sums are entered on the electronic form. Individual athlete data are not preserved by the Data Tabulation form.

The event’s clinical director must accomplish two steps before the Healthy Hearing HAS screening forms go to the state or country Healthy Athletes office.

1. Tally the athletes’ HAS form outcome data according to the Data Tabulation form, and enter the tallies on a printed copy of the form. Carefully crosscheck the tallies in each box on the form to be certain they agree where they should. For example:

   a. Pass OAE + Refer OAE = Total Athletes (see top left-hand blue box on the Data Tabulation form)

   b. Pass Tymp + Refer Tymp under Refer OAE = Total of Refer OAE

   c. Pass PT + Refer PT under Refer Tymp = Total of Refer Tymp

   d. Pass PT + Refer PT under Refer OAE and Pass Tymp = Total of Pass Tymp
2. Take each sum from the printed Data Tabulation form and enter it into its respective box on the electronic version of the form. It will automatically summarize the results of the event. Download a copy of the completed form so you can retain your overall results and share them with your team and state or country Special Olympics organization. Finally, immediately e-mail the completed Data Tabulation form to pierce105@chapman.edu.
CONCLUSIONS

Healthy Hearing is designed to assess and report the prevalence of hearing loss among Special Olympics athletes as a means of focusing attention on the hearing health care needs of individuals with intellectual and related developmental disabilities. Equally important, Healthy Hearing identifies athletes with hearing loss and ear health problems through hearing screening and testing; notifies/counsels them about needed follow-up care; and whenever possible, provides follow-up care on site at Special Olympics events. Healthy Hearing also informs athletes, coaches and caregivers about the prevention of hearing loss by providing informative brochures to them at events and through a Web site.

Reduced hearing can have a significant negative impact upon an athlete's ability to respond to directions in training, as well as understand other oral information from coaches, trainers and judges. The safety of the athlete also can be jeopardized by a hearing loss, as can the athlete's interpersonal relationships.

Hearing screening and threshold testing are the first steps in the process of identifying an athlete's hearing loss and/or ear health problems, defining appropriate solutions and preventing negative effects from occurring in sporting and social events.

Healthy Hearing's screening and test findings are shared in written form with each athlete and his/her coach or accompanying person so that the athlete's follow-up needs can be pursued. The overall findings of Healthy Hearing are reported to the Healthy Athletes initiative to assist in policy discussions and directions that may improve the health care of Special Olympics athletes and others with intellectual disabilities.

All screening/testing/recommendation information about respective athletes is maintained in confidentiality.

Healthy Hearing is modeled after public health screening programs that screen, identify and refer for evaluation and treatment. Its procedures identify specific Special Olympics athletes needing audiological evaluations to determine the extent of hearing loss and possible treatment, including hearing aid use. It also identifies those athletes requiring medical evaluation/treatment for ear problems. Healthy Hearing takes the public health model one step further by providing components of an audiological evaluation (pure tone threshold testing) on site at Special Olympics events. In certain circumstances, too, Healthy Hearing provides audiological prevention/intervention services at events in the forms of distributing earplugs for protection from very loud sounds, swim plugs, conducting minor repairs of hearing aids and fitting or distributing hearing aids.
Healthy Hearing also teaches and trains students, audiologists, physicians, health care providers and educators about hearing loss and ear health problems among individuals with intellectual disabilities. These activities occur on site at Special Olympics events and at other professional education venues. Healthy Hearing reports its findings in professional journals, at professional meetings and in the popular press and electronic media.
Audiogram
A chart of numbers indicating the pure tone threshold response level at respective test frequencies provided by a person when tested. The chart is found on the Healthy Athlete Screening form, and has spaces to record air-conduction thresholds for right and left ears. The audiogram chart also has spaces to record best bone-conduction thresholds; that is, bone-conduction thresholds taken from only one mastoid process, without masking the opposite ear so that the threshold values do not distinguish the ear from which the bone-conduction results came. These audiogram data points for air- and bone-conduction thresholds at various test frequencies for the right and left ears, and for bone-conduction thresholds, can also be displayed on a graph format separate for the screening form (see Appendix, Audiological Record).

Audiometer
An electroacoustic device that allows the measurement of hearing.

Air-conduction
A sound (e.g., 1000 Hz pure tone) generated from an audiometer to a calibrated earphone placed over the outer ear canal, so that the sound wave travels through the outer and middle ear, and then into the inner ear.

Bone-conduction
A sound presented by an audiometer to a calibrated bone-conduction vibrator, usually placed on the head's mastoid process behind an ear, so that sound waves are transmitted through the skull to the inner ear directly; that is, bypassing the outer and middle ears.

Decibel (dB)
A unit of measure of sound intensity.

Evoked otoacoustic emissions
A sound level measured in the outer ear canal as a consequence of stimulating the inner ear's outer hair cells with calibrated sound stimuli.

Frequency
A measure of a sound wave called hertz (Hz), which describes its pitch (low to high).

Hearing Level (HL)
Intensity level of sound, expressed in dB and based on an established norm, as measured through an audiometer.

Otoscope
A handheld device used to look into ear canals and at eardrums.

Pure tone
A sound of a specific frequency (e.g., 1,000 Hz, 2,000 Hz, 4,000 Hz).

Tympanometry
Electroacoustic measurement of eardrum and middle ear conditions.
HEALTHY HEARING SPECIAL OLYMPICS
EQUIPMENT AND SUPPLIES

Ordering and Shipping of Equipment
Specific equipment can be ordered through Special Olympics in Washington, D.C. The order form can be found on the Special Olympics Web site. The equipment request form must be completed and submitted by the Healthy Hearing clinical director at least 60 days before a U.S. event, and 90 days before an event in another country. Every effort will be made to fulfill requests made by clinical directors. DO NOT contact the manufacturers directly for equipment. If you have questions, contact the Special Olympics Healthy Hearing manager in Washington, D.C. Upon submission of the order form, you will receive two confirmations: 1) Special Olympics will send an acknowledgment of the request the same day it is submitted; and 2) Special Olympics also will send a confirmation at least 10 days before the specified “need-by” date for the event.

When specifying the “need-by” date on the equipment request form, please allow two to three days before the event to charge the equipment and to do a behavioral check of equipment before its use, as well as time for volunteer training before the event. If you have any questions about receiving the equipment before the event, contact the Healthy Hearing manager.

If the electrical line voltage to be used with the equipment is 220 volts rather than 110 volts, please indicate this on the equipment request form. With advance notice, some equipment can be shipped with power cords accommodating 220-volt electrical power receptacles. Even so, you may need power adaptor plugs to connect the equipment’s power cord plugs to a particular country’s electrical wall sockets or power receptacle strips (see supplies section below).

All equipment is to be shipped back, or forwarded as instructed, within two days of an event’s completion because other Healthy Hearing clinical directors are waiting to use it at their events. The hearing testing equipment is shipped to an event at the expense of the manufacturer/supplier. Your state or country Special Olympics organization is responsible for paying the return shipping. This return shipping cost can be included in the state or country’s yearly grant request to Special Olympics Washington, D.C., or it can be paid for by the respective Special Olympics state or country organization. If the equipment is to be forwarded from your event to another (before being returned to the manufacturer/supplier), the cost of that shipment is the responsibility of the respective manufacturer/supplier (see below).

A return shipping form from the respective manufacturer/supplier will be included in the box of shipped equipment. Please keep this shipping form in a safe place to use for the return shipment. If you are instructed to forward the equipment to another event (i.e., not directly back to the manufacturer), the manufacturer/supplier will indicate this on documents in the box of equipment you receive, and will include a shipping form addressed to the next event. Keep this form in a safe place, too. This “forwarding” shipping form indicates that the shipment cost will be charged to the manufacturer/supplier, not the state or country Special Olympics organization.
Since state or country yearly grant requests to Special Olympics Washington, D.C., are submitted well in advance of planning for equipment distribution to events, it is not possible to know whether equipment will be returned directly from an event or forwarded to another event. Therefore, it is prudent to include return shipping costs in the Special Olympics state or country grant request. Again, whether shipping equipment directly back to the manufacturer/supplier or forwarding it to another Special Olympics event, you must ship it within two days of your event’s conclusion so that other Healthy Hearing clinical directors can use the equipment.

If you plan to use a hearing test booth (Eckel Industries of Canada, Ltd.) at an event, follow the procedures described above. That is, specify its need on the Special Olympics equipment request form and include its shipping costs in the state or country grant request to Special Olympics Washington, D.C. In this instance, however, the costs to as well as from an event must be included in the grant request. Contact the Healthy Hearing manager to get specific cost estimates.

**Equipment and Supplies**

The equipment and supplies needed to conduct a Healthy Hearing screening program will depend on the expected number of athletes to be screened and the number of days for screening at a Special Olympics event. The following list identifies the equipment and supplies needed to screen 500 athletes for five hours per day for two days. It presumes a steady flow of athletes for screening each day. If greater numbers of athletes are to be screened at an event, more equipment and supplies will be needed.

**Equipment**

1. Bio-logic Systems Corporation, Model AuDX-1 distortion product otoacoustic emissions units — five units and 600 disposable ear tips (100 per bag) as follows: three bags adult size, two bags child size, one bag large size

2. Grason-Stadler Viasys Healthcare Corporation Model GSI 37 tympanometers — four units and 100 reusable ear tips of various sizes

3. Grason-Stadler Viasys Healthcare Corporation Model GSI 17 pure tone air-conduction only audiometers — four units

4. Grason-Stadler Viasys Healthcare Corporation portable pure tone air- and bone-conduction audiometers — four units
   Note: If Grason-Stadler units are not available, other air- and bone-conduction audiometers, obtained locally, will suffice as long as they are calibrated.

Supplies

1. Forms
   - Healthy Athlete Screening forms—600.
     Note: All forms are available to download from the Special Olympics Web site www.specialolympics.org
   - Screening Summary Results form*—400, for athletes passing screening.
   - Screening Follow-up Recommendations form*—200, for athletes not passing screening.
   - Pure Tone Threshold Test Results/Recommendations form*—200, for athletes provided threshold testing.
     *Arrange to make a copy of any of these forms before it is given to the athlete to enable follow-up after the games.

2. Otoscopes
   - Eight if rechargeable handle-type, so that five are always fully charged.
   - Five if battery-type, with a two-day supply of batteries for each.

3. Otoscope specula
   - One bag of adult and one bag of child disposable specula.
     Note: the WelchAllyn Company sells bags of 1000 specula each, which are most economical for an event. Unused specula can be saved for future events.

4. Spectroline Model EF-160 Ultraviolet Light—four if conducting only pure tone screening; eight if also doing pure tone threshold testing.

5. Branson Model B3-R Ultrasonic Ear Tip Cleaning unit—three.


7. Metal or plastic strainer for rinsing ear tips following their cleansing—three.

8. Pipe cleaner packs for GSI 37 tympanometer metal tip cleaning—four

9. Nonlatex gloves—1500 pairs (3000 gloves); add 250 pair (500 gloves) for pure tone threshold testing. Pair sizes: 300 small, 1000 medium, 200 large.

10. Plastic trays, small with lids—six
    - Two for dirty/reusable specula.
    - Four for dirty/reusable tympanometry tips.

11. Waste basket plastic bags, medium size—three dozen

12. Ballpoint pens—two dozen

13. Duct tape—two rolls
    - To tape wastebasket bags to screening stations.
    - To tape electric power cords to floor.

14. Packaging tape—three rolls
    - To repackage equipment/supplies at event’s conclusion.
15. **Scissors**—one pair

16. **Electrical power cords**—8, 25 or 50 feet each, depending upon the distance from wall power receptacles and each station’s tables—eight
   - Safety orange, general-use outdoor power cord, medium capacity, 16 gauge.
   - Note: Add two more for pure tone threshold testing.

17. **Power strips** with six grounded receptacles each, for respective tables at each station—eight
   - On-off switch and restart button, 15 amp, 120 volt, 60 Hz, continuous duty.
   - Notes: Add four for threshold testing.

18. **Healthy Hearing “giveaways” to athletes**—500

19. **Master file of laminated instructions**—two each of the following:
   - External Ear Canal Inspection
   - Healthy Hearing Screening Using AuDX-1
   - Healthy Hearing Tympanometry Using GSI 37
   - Pure Tone Screening
   - Pure Tone Threshold Testing
   - Note: Place copies of each form at respective screening stations. Also, make ten laminated copies of the Healthy Hearing Daily Protocol and place two at each station.

20. **Banners for Healthy Hearing**—three-plus
    - For attachment to walls in screening area
    - One for Healthy Hearing
    - One for Bio-logic Systems Corporation
    - One for Grason-Stadler Viasys Healthcare Corporation
    - Others for supporting organizations (e.g., Eckel Industries of Canada, Ltd.) if applicable to event

21. **Paper towel rolls**—12

22. **Electrical power transformers (small portable)**—if needed
   - A step-down transformer, if needed, to go from 220-volt wall outlet power supply to equipment requiring 120-volt power.
   - A step-up transformer, if needed, to go from 120-volt wall outlet power supply to equipment requiring 220-volt power.

23. **Blunt-end tweezers**

24. **Tablecloths**, paper with bright colors and/or design—12

25. **Sound-level meter**, inexpensive Radio Shack type
26. **Electrical power cord plug adaptors** — very likely needed in countries using 220-volt electricity. The configuration of three-pronged power receptacles can vary among countries using 220-volt electricity. Therefore, to use the Healthy Hearing equipment’s 110-volt power cord plugs in a particular country, a supply of power cord plug adaptors specific to that country needs to be available. A total of 13 to 20 adaptors are necessary, as follows:

- Five for Bio-logic AuDX-1 EOAE units
- Four for Grason-Stadler tympanometers
- Four for Grason-Stadler pure tone screening audiometers
- Three for otoscopes, if rechargeable handle-type otoscopes are used
- Four for pure tone threshold audiometers, if threshold testing is conducted at the event

27. **Brochures**—Two types from Special Olympics headquarters in Washington, D.C.
- Healthy Hearing description
- Noise Protection
  Note: Order 500 of each brochure; order from Special Olympics headquarters in Washington, D.C.

28. **PowerPoint presentation describing Healthy Hearing**
  Note: Used for training purposes and for public relations information; order from Special Olympics headquarters in Washington, D.C.
SPECIAL OLYMPICS HEALTHY HEARING
REQUIREMENTS FOR SCREENING AND THRESHOLD TESTING AREAS

The space for the Healthy Hearing program must be large enough to accommodate the necessary screening stations, as well as the flow of athletes from station to station. In addition, the area must be a quiet one to allow for effective hearing screening. Furthermore, everyone working near and especially in the area must conduct their respective activities quietly when screenings are taking place.

The essential requirements for the space listed below are based on screening 500 athletes over two days. Notations are included for specific items listed if the number of athletes to be screened is fewer or more than 500 in two days.

1. **Space size**—A self-contained space of no less than 50 feet by 50 feet is needed, within which are located a registration table, a check-out table, four screening stations, another station where hearing aids can be checked and minor repairs made, and a place where noise-protection earplugs/swim plugs are distributed and/or made for athletes. The respective functional areas must be arranged so athletes, coaches, screening staff and others can move about easily and in an orderly fashion. The accompanying floor diagram (figure 3) offers a suggested layout. Whenever possible, the supply and storage areas should be in closets or screened-off areas.

   If fewer than 250 athletes will be screened in two days, a slightly smaller overall space can be used (no less than 40 feet by 40 feet), within which registration/check-out activities can be combined and Station 2 will be half the space shown in figure 3.

   If more than 500 athletes will be screened in two days, a larger space of no less than 60 feet by 60 feet will be needed. Additional screening units at each of the four screening stations will be necessary to accommodate the easy flow of athletes.

   It is very important to determine well in advance of a Special Olympics event just how many athletes will be screened over what number of days (including the number of daily hours for screening). This information permits an estimation of the number of athletes per hour to be screened which, in turn, determines the size of each screening station. These estimates translate into the overall space required.

   Pure tone threshold testing is recommended for Healthy Hearing events. Therefore, more space is needed than is shown in figure 3. A separate, very quiet room near the screening area is preferred. It will need to accommodate four spaces, widely separated, for testers and athletes. A room no smaller than 30 feet by 30 feet will accommodate the testing and flow of people, as shown in figure 4.

2. **Furniture**—tables and chairs are the principal items of furniture. Tables should be six feet by three feet. Comfortable stacking chairs without arms are necessary. Plan to cover the tables with paper tablecloths, preferably with pleasant designs on them.
Figure 3: Recommended Healthy Hearing Space Use Layout
Figure 4: Recommended Healthy Hearing Threshold Testing Space Layout
As shown in the figure 3 layout, 16 tables and 39 stacking chairs are needed. If more or fewer than 500 athletes are to be screened, then table and chair requirements will change accordingly.

3. **Electrical power outlets**—It is preferable to have electrical outlets every six to eight feet along each wall, about one foot above the floor. Ideally, each outlet will have four receptacles. If the space has fewer power outlets along each wall and only two receptacles, then extension cords and power receptacle strips may be required to bring power to the equipment at each screening station (see equipment and supplies list).

If 110-voltage electricity is supplied, then screening equipment must have the same power requirement. If 220-voltage electricity is supplied, equipment that can accommodate this voltage requirement must be used. However, if 110-voltage equipment will be used with a 220-volt power supply, then a step-down transformer may be necessary between the wall outlet and the equipment. A step-up transformer is required between a 110-voltage power supply and 220-volt equipment.

Confer with an electrician for the event location well in advance of the event date to review power outlet locations, the need for power extension cords/strips and voltage requirements.

4. **Water supply**—It is imperative to have a source of running water at a sink in or very near the screening area. Screening staff needs to wash tympanometry ear tips and possibly otoscope specula regularly throughout the day.

5. **Storage area**—A secure space, preferable a small room or very large closet in or very near the area, is required to store equipment boxes, equipment, supplies and personal belongings of screening volunteers. It is important for each screening station area to be orderly at all times. An orderly appearance can be maintained if a secure storage area is close by.

6. **Sound level**—The screening area must be away from any constant or intermittently loud sounds. Also, the screening volunteers must conduct all their activities very quietly whenever athletes are being screened. Volunteers and athletes tend to talk with each other at an average conversational level. If volunteers maintain a very soft conversational level (almost a whisper), usually others will do the same. This communication style will be most helpful in achieving the best results for each athlete. Use the sound-level meter to help monitor noise levels during the screening.

Before the screening program begins and several times each day during the event, several volunteers with normal hearing (preferably 20- to 25-year-olds) should pass a pure tone hearing screening at 25dB HL at 2000 and 4000 Hz. Such findings will indicate that the sound level of the area does not interfere with screening in this frequency range. This behavioral assessment of the sound environment supports sound-level measurements that may be taken of the area using a calibrated sound-level meter.
SPECIAL OLYMPICS HEALTHY HEARING
REFERENCES


Eunice Kennedy Shriver, Special Olympics Founder and Honorary Chairman, is an inspiration for her creative endeavors that provide such positive benefits for individuals worldwide. Without her altruism, Special Olympics and Healthy Hearing would not exist.

Very special gratitude goes to Dr. Robert Cook for his vision of adding hearing screening to the Special Olympics Healthy Athletes initiative. His abiding interest in the welfare of athletes participating in Special Olympics, as well as in other people with intellectual and developmental disabilities, is much to be admired.

Healthy Hearing would not have been possible without the initial generous donation of equipment, and continuing interest in the welfare of Special Olympics athletes from these supporters:

Bio-logic Systems Corporation
Mundelein, Illinois

Grason-Stadler Viasys Healthcare Corporation
Madison, Wisconsin

Eckel Industries of Canada Limited
Morrisburg, Ontario, Canada

GlaxoSmithKline

Support of Healthy Hearing by the Children’s Hearing and Speech Center, Children’s National Medical Center, Washington, D.C., and Chapman University, Orange, California, is also gratefully acknowledged.
SPECIAL OLYMPICS HEALTHY HEARING
APPENDIX

1. Audiological Record
2. Authorization to Release Healthy Hearing Information
3. Authorization to Release Health Information to Special Olympics Healthy Hearing
4. Pure Tone Threshold Test Results/Recommendations Form
5. Screening Summary Results Form
6. Screening Follow-up Recommendations Form
7. Application for Healthy Hearing Volunteers
8. Planning Schedule for Healthy Hearing: Tips for the Healthy Hearing Clinical Director Months Before an Event
9. Description of Healthy Hearing Clinical Director
10. Healthy Hearing Quality Assurance Program
11. Quality Assurance Questionnaire
12. Dehydration and Heat Stress Recommendations for Volunteers
13. AuDX-1 Two-Page Troubleshooting Document
14. GSI 37 Two Pictures of Normal and Abnormal Tympanograms
15. GSI 37 Test Results
16. GSI 37 Test Status Symbols
17. GSI 37 Troubleshooting Information
18. Healthy Hearing Data Tabulation Form
19. Healthy Athlete Screening Form
20. Equipment Request Form
21. About Special Olympics Healthy Athletes
22. Special Olympics, The Global Movement
Authorization to Release Healthy Hearing Information

Athlete’s Name (print) ___________________ Address (print) ___________________ Phone Number ___________________

1. I, ____________________, authorize the use or disclosure of the above named individual’s Healthy Hearing information as described below.

2. Special Olympics is authorized to make this disclosure to:

________________________________________________________

Address: __________________________________________________________________________________________

For the purpose of: ☐ Continued Medical or Health Care ☐ Other ____________________ (specify)

3. The type of information to be disclosed is as follows (include date(s) where appropriate):
☐ Healthy Hearing Screening Summary Results Report _____________________________ date
☐ Healthy Hearing Screening Follow-up Recommendations Report __________________________ date
☐ Healthy Hearing Pure Tone Threshold Results/Recommendations Report ______________ date

4. I understand that I have the right to revoke this authorization at any time. I understand that if I revoke this authorization, I must do so in writing and present my written revocation to Special Olympics. Unless otherwise revoked, this authorization will expire on the following date, event or condition: _____________________________. If I fail to specify an expiration date, event or condition, this authorization will expire in twelve months.

5. I do hereby declare that I am the person named above, or the legal guardian or authorized person responsible for the release of information about the above named person. I understand that authorizing the disclosure of this Healthy Hearing information is voluntary. I understand that I may inspect the information to be disclosed.

Athlete, Legal Guardian or Authorized Person ___________________ Phone Number ___________ Date ___________
Authorization to Release Health Information to the
Special Olympics Healthy Hearing Program

Athlete’s Name (print) __________________________ Address (print) __________________________ Phone Number __________

1. I, __________________________, authorize the release of health information about the above named athlete from
Name (print) __________________________ Address (print) __________________________ Phone Number __________
to the Special Olympics organization of
State, Country (print) __________________________ Address (print) __________________________ Phone Number __________

2. I understand that I have the right to revoke this authorization at any time. I understand that if I revoke this authorization, I must do so in writing and present my written revocation to the above named health provider. Unless otherwise revoked, this authorization will expire on the following date: __________________________. If I fail to specify an expiration date, this authorization will expire in twelve months.

3. I do hereby declare that I am the person named above, or the legal guardian or authorized person responsible for the release of information about the above named person. I understand that authorizing the disclosure of this health information is voluntary. I understand that I may inspect the information to be disclosed.

Athlete, Legal Guardian or Authorized Person __________________________ Phone Number __________________________ Date __________
# Healthy Hearing Program

**Special Olympics International**

**Pure Tone Threshold Test Results/Recommendations**

<table>
<thead>
<tr>
<th>Athlete’s Name (print)</th>
<th>Special Olympics Event (print)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Athlete’s Address (print)</th>
<th>Athlete’s Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- [ ] You participated in pure tone threshold testing because you did not pass hearing screening
- [ ] You did not pass middle ear screening
- [ ] Your ear canal showed excessive ear wax

- [ ] Pure tone threshold tests showed the following **Type** and **Degree** of hearing loss
  - [ ] Bilateral Sensorineural Hearing Loss
    - [ ] Mild
    - [ ] Moderate
    - [ ] Severe
  - [ ] Unilateral Sensorineural Hearing Loss
    - [ ] Right
    - [ ] Left
  - [ ] Bilateral Conductive Hearing Loss
    - [ ] Mild
    - [ ] Moderate
    - [ ] Severe
  - [ ] Unilateral Conductive Hearing Loss
    - [ ] Right
    - [ ] Left
  - [ ] Mixed Bilateral Hearing Loss
    - [ ] Mild
    - [ ] Moderate
    - [ ] Severe
  - [ ] Mixed Unilateral Hearing Loss
    - [ ] Right
    - [ ] Left
  - [ ] Normal Hearing
    - [ ] Right
    - [ ] Left
    - [ ] Both

- [ ] Recommendations for Follow-up Services
  - [ ] Ear wax removal
    - [ ] Right
    - [ ] Left
    - [ ] Both
  - [ ] Medical evaluation of ears
  - [ ] Audiological evaluation of hearing
  - [ ] Ear molds for hearing aid use
  - [ ] Hearing aid evaluation and fitting
  - [ ] Hearing aid orientation program
  - [ ] Aural rehabilitation program including auditory training and speech reading

- [ ] Services provided to you at this Special Olympics event
  - [ ] Ear Canal Inspection
  - [ ] Hearing Screening
  - [ ] Middle Ear Screening
  - [ ] Hearing Threshold Testing
  - [ ] Hearing Aid Repair/Maintenance
  - [ ] Ear Mold For Hearing Aid Right
  - [ ] Ear Mold For Hearing Aid Left
  - [ ] Hearing Aid Right
  - [ ] Hearing Aid Left
  - [ ] Noise Earplug Right
  - [ ] Noise Earplug Left

-----

(signature)  (print)

- [ ] Audiologist  or  [ ] HH Clinical Director
HEALTHY HEARING PROGRAM
SPECIAL OLYMPICS INTERNATIONAL

SCREENING SUMMARY RESULTS

<table>
<thead>
<tr>
<th>Athlete’s Name (print)</th>
<th>Special Olympics Event (print)</th>
<th>Date</th>
</tr>
</thead>
</table>

- **Congratulations!** You passed your hearing screening in both ears.

- Services you received at this Special Olympics event include:
  - Ear canal inspection
  - Hearing screening
  - Middle Ear screening
  - Noise protection brochure
  - Other ________________

- You Need To:
  - have ear wax removed from your ear canal  
    - Right  
    - Left
  - see your physician about possible middle ear problems  
    - Right  
    - Left
# Healthy Hearing Program
Special Olympics International

## Screening Follow-up Recommendations

<table>
<thead>
<tr>
<th>Athlete's Name (print)</th>
<th>Special Olympics Event (print)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>Athlete's Address (print)</th>
<th>Athlete's Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- [ ] You Did Not Pass Hearing Screening
  - [ ] Right
  - [ ] Left
- [ ] You Did Not Pass Middle Ear Screening
  - [ ] Right
  - [ ] Left

- [ ] You Did Not Pass Middle Ear Screening
  - [ ] Right
  - [ ] Left

- [ ] Services you received at this Special Olympics event include:
  - [ ] Ear canal inspection
  - [ ] Hearing screening
  - [ ] Middle Ear screening
  - [ ] Noise protection brochure
  - [ ] Hearing Loss Brochure
  - [ ] Other ______________________

- [ ] Recommendations
  - [ ] See physician for ear wax removal
    - [ ] Right
    - [ ] Left
  - [ ] See physician for possible middle ear problems
    - [ ] Right
    - [ ] Left
  - [ ] See audiologist for evaluation of your hearing

- [ ] Comments __________________________
  __________________________
  __________________________

- [ ] __________________________(signature) __________________________ (print)
  - [ ] Audiologist or [ ] HH Clinical Director
Name (print)

Last        First        MI          Birthdate (optional)

Address

Street      City      State/Province      Zip Code      Country

Country Code      Area Code      Telephone      E-mail      Fax

Current position and responsibilities ________________________________

Education (dates of degrees if any) ________________________________

License or certificates (if any) ________________________________

Experience (if any) in hearing screening and/or testing ________________________________

Have you received SOI Healthy Hearing Training (2 hrs)? yes/no When & Where? ________________________________

If no, are you willing to? ________________________________

Health status:

Most recent physical examination (date) ________________________________

Test for tuberculosis (date and result) ________________________________

Immunizations (please list) ________________________________

Special needs or accommodations ________________________________

Availability (circle the maximum amount of time you can volunteer)

State Games one-half day 1 day 2 days

Regional/Country Games 2 days 3 days 4 days

International Games 4 days 5 days 6 days

Languages spoken fluently ________________________________

Date ________________________________ Signature ________________________________

Please send to Dr. Judy K. Montgomery

Global Clinical Coordinator

Healthy Hearing Program

Special Olympics International

c/o Chapman University, School of Education

1 E University Drive
## Planning Schedule for Healthy Hearing Events

**Tips for Healthy Hearing Clinical Directors**

<table>
<thead>
<tr>
<th>Approximate Date</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 months before the Healthy Hearing Event</td>
<td>Determine date of Special Olympics Event in your area&lt;br&gt;Inform the Healthy Hearing Data Assistant – <a href="mailto:healthyhearing.SOI@gmail.com">healthyhearing.SOI@gmail.com</a></td>
</tr>
<tr>
<td>4 months before</td>
<td>Alert equipment manufacturer of your event dates by completing and Emailing the 2-page Healthy Hearing Equipment Request form found on the SO Website. <a href="http://www.specialolympics.org">www.specialolympics.org</a>&lt;br&gt;This form will also alert the Healthy Hearing SO Manager in Washington, DC.&lt;br&gt;Review the supplies needed and determine how to get them. See Equipment and Supplies section of the HH Manual.</td>
</tr>
<tr>
<td>3 months before</td>
<td>Contact local volunteers for screening; 14-24 persons will be needed depending on the size of the event.&lt;br&gt;Attend local planning meetings with Special Olympics, if held.&lt;br&gt;Select room/area for hearing screening. A quiet 50 x 50 square feet area strongly recommended.</td>
</tr>
<tr>
<td>2 months before</td>
<td>Re-contact all volunteers with information on where to meet, and determine who needs training.&lt;br&gt;Submit list of venue materials needed to local Special Olympics organizers (tables, chairs, power source, gloves, signs, etc.)&lt;br&gt;Decide if you can get small “incentive” gifts for the athletes who attend. These are often donated items - food treats, earplugs, sports towels, CD carry cases, marking pens and other items. It is your choice if you wish to seek these gifts. Small bags are also very helpful for athletes to carry items and their HH report form. Sponsors will often donate these as well.</td>
</tr>
<tr>
<td>1 month before</td>
<td>Assign one volunteer to help you manage the event, sort equipment, transport supplies; as well as, get volunteer badges, HH Manuals, pencils, forms. Download HH HAS Report form from SO Website. Make copies for screening event. Download the 3 HH Report forms. The Screening Summary Results form comes in multiple languages; choose the one you need from the SO website. You may also want to translate the other HH report forms from English to the language used at your event. You may wish to translate the HH HAS form from English to the languages needed for local, regional or world events, too.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3-5 days before</td>
<td>Visit the site if possible to be sure the room is adequate, accessible, and has electric power where needed. You may wish to arrange for 4-5 non-professional volunteers who can help with registration of athletes, not hearing screening. Family members, service organization members and friends are all welcome to assist you! Find out the system for your volunteers to receive name badges, pins, drinking water during the day, lunch, and other things that Special Olympics provides to its volunteer workers. <em>Receive the HH screening equipment sent by manufacturers. Keep all the return shipping instructions in a safe place. This step is important.</em></td>
</tr>
<tr>
<td>1 day before</td>
<td>Assemble HH equipment, supplies, recording forms, all athlete gift items, gloves, backup batteries, etc. Charge the otoacoustic emissions units and tympanometers overnight. If your otoscopes use re-chargeable batteries, charge them overnight as well. You will need HH Manuals, HH shirts, and agendas if you are training new trainers, as well as local volunteers. You may want to plan the schedule so your volunteers get regular breaks during the day.</td>
</tr>
<tr>
<td>THE BIG DAY!</td>
<td>Have fun screening the athletes!! If you are screening more than one day, be sure the equipment is put away each night and secured. Plug in all battery powered devices so they are fully charged by the next morning. Keep the athlete forms in separate PASS and NO PASS boxes so you can tabulate easily. Try to summarize data according to HH guidelines that day or soon after, so you can de-brief on your experience and share the accomplishments with your volunteers.</td>
</tr>
</tbody>
</table>
THE BIG DAY! (continued)

Pack up all remaining supplies and store for the next event, or ship where instructed.

*Pack up all the equipment and IMMEDIATELY ship to the manufacturers per the shipping instructions sent with each box. This step is very important! Special Olympics pays the shipping costs to return equipment.

One week later

Tabulate the data collected and fill out the form. Send the completed electronic HH Data Tabulation Form by email to the HH Data Assistant.

After completing the data tabulations, send the HAS athlete forms to your Special Olympics office.

Send or give one set of the HH Data Tabulation Form to the Special Olympics Organizing Committee Chair or a designated person in your local program.

Two weeks later

Send Dr. Herer your responses to the HH Quality Assurance Questionnaire. Let him know if official thank-you notes are needed for donors, etc. Thank all of your volunteers by email, phone, or whatever way is appropriate.

Share any photos you have taken with Dr. Judy Montgomery, Global Clinical Coordinator, Email: montgome@chapman.edu so they can be sent to the Healthy Hearing Website. www.health-hearing.org

If called upon during the year.

If called upon during the year, please share your experiences with the local press, write articles about the event, and inform others of the HH Program. If families call upon you for follow-up services, please direct them to agencies or individuals who can further evaluate their hearing needs. We are very interested in what follow-up services might be needed (hearing aids, medical treatment, etc.). Please contact Dr. Herer for any assistance or suggestions for appropriate steps to take. Email: gherer@cnmc.org
Description of 
Clinical Director for Healthy Hearing

The Clinical Director (CD) is a hearing healthcare professional (i.e. audiologist, physician) who has the appropriate license and/or credentials for the particular state or country to supervise all volunteers who are screening the hearing of athletes. If CDs do not hold these credentials, they must arrange to have several appropriately credentialed hearing healthcare professionals at the screening site at all times. In some countries, physicians may be the only appropriately credentialed professionals to supervise.

A Clinical Director for Healthy Hearing (HH) Special Olympics (SO) does the following:

1. Attends a formal training program on the site of a Special Olympics Games competition. It is called a Train-the-Trainer program consisting of a seminar for a half-day, followed by at least one hour of hands-on familiarization with the screening equipment. Sets up the screening site with its equipment and supplies to demonstrate what trainees need to bring and do when they set up a screening event in their respective location. Next, the trainees (with the trainers available for coaching) start screening SO athletes at the sports event. All of these steps give the new clinical director the practical experience needed to conduct his/her own program "back home." The HH training manual provides a permanent step by step "how to" document for the clinical directors.

2. Works with the respective state/country SO organization to plan space and logistics for the Healthy Hearing program at SO sports events. Usually there is one major Games event each year. This could mean 600-1700 athletes present for 1-2 days and a potential to screen about 300 athletes per day.

3. Works with the state/country SO organization to determine a small budget for the Healthy Hearing program's yearly supplies, equipment shipping costs, etc.; and perhaps a one-time capital equipment outlay for such items as otoscopes, sound level meter, small tool kit, eartip cleaning unit, etc.

4. Recruits and trains volunteers from among the local audiologists and physicians to be screeners at events. Experience has shown that speech-language pathologists, teachers of the Deaf/Hard-of-Hearing and special educators, healthcare professionals, and audiology technicians are excellent volunteers. Graduate students in all of these professional areas (particularly audiology) are fine volunteers, as are their professors.
5. Contacts the manufacturers who supply the screening equipment (using the Equipment Request form on the SO website), provides the dates of events, and when/where to ship the equipment. The Healthy Hearing Manager at SO headquarters in Washington, DC is also alerted when the Equipment Request form is submitted. The HH Manager is available to help HH Clinical Directors with equipment and other HH program issues. After the event, re-ships the equipment back to the manufacturers. (The state/country SO organization handles the cost of the return shipping).

6. Analyzes the data gathered at an event (using the Healthy Hearing Data Tabulation Form supplied by SO's Healthy Hearing program), and sends a copy to the Healthy Hearing Global Program Data Assistant for inclusion in the database of all state/country/regional games.

7. Communicates any suggestions and/or needs to SO's Senior Global Advisor for Healthy Hearing, Dr. Gilbert Herer, Email: gherer@cnmc.org

8. Volunteers, whenever possible, to help train at other state and/or country games (travel costs paid by SO).

9. Follows-up with families and athletes who need hearing healthcare with the knowledge and support of the local Special Olympics program.

A country or state SO organization may conduct several Games events during the year, and may request a screening program at more than one of these events. It is the HH Clinical Director’s decision to conduct a screening program more than once per year, usually determined by the CD’s schedule and the availability of volunteers.
Healthy Hearing Program
Special Olympics International

Quality Assurance Program

The following activities constitute the quality control initiatives of the Healthy Hearing (HH) Quality Assurance Program. These activities are reviewed annually and updated as necessary.

1. The manual (revised 2006) provides the step-by-step procedures that each HH Clinical Director (CD) is expected to follow at each event.

2. A training session is conducted for all volunteers on-site of an event before HH screening/testing begins.

3. HH CDs provide on-site supervision/monitoring at each event.

4. All screening events are supervised by one or more professional who are licensed/certified to provide audiological services in that state or country.

5. The HH Data Tabulation Form is sent to pierce105@chapman.edu from each event by its HH CD. These data are compared to an existing global database (currently consisting of results from over 17,000 athletes). The Senior Global Advisor and the Global Clinical Coordinator review respective event data, and variances are explored with the event’s HH CD.

6. Each event uses identical screening equipment.

7. Each unit of equipment is calibrated after every 4th use.

8. An extensive, standard list of supplies is provided to HH CDs that they are to use. The Global Clinical Coordinator must approve variations from the list.

9. Universal Health Precautions are prescribed, and are used at each event. These include: volunteer screener/tester use of non-latex gloves for each athlete; use of ultraviolet light on earphone cushions and headband after use with each athlete; cleaning of tympanometry tips and otoscope specula (after each use) in a sonic cleaning unit containing an approved cleaning fluid; disposal of otoscope specula (designed for one-time use) after each athlete’s ear canal exam; and, disposing of evoked otoacoustic emissions tips after use with each athlete.

10. Periodic sound level meter measurements are conducted at events to determine if acceptable noise levels for hearing testing exist.
11. Threshold testing is conducted at events, whenever possible, to detect any over-referral rates from put tone screening.

12. Hydration guidelines are provided to HH volunteers at each event so they are prepared to avoid dehydration and heat stress.

13. A planning schedule for monthly HH CD activities is provided for CDs to follow each month starting 5 months before an event.

14. The HH Quality Assurance Questionnaire is completed by each HH CD following respective state/country events, and sent to the HH Senior Global Advisor or Global Clinical Coordinator. Information thus gathered is analyzed and used in HH’s continuous quality improvement program.

15. A continuous quality improvement (CQI) program is conducted. It involves studies of identified issues, problems and circumstances. HH institutes programmatic and/or procedural changes/strategies as indicated by outcomes from the CQI studies.

16. The HH Manual has graphs and pictures that standardize the range of findings for tympanometry. The Manual also includes troubleshooting procedural steps to be followed if problems occur using the evoked otoacoustic emissions and tympanometry equipment.
Healthy Hearing Program
Special Olympics International
Quality Assurance Questionnaire

HH Clinical Directors: After each event, please fill out the identifying information (below), answer the questions that are listed, and send your response by Email to gherar@cnmc.org

Date of Event ____________________________ Date this Information prepared ____________________________
Place of Event
Clinical Director completing this information ____________________________
Address ____________________________ Daytime phone # ____________________________
Email address ____________________________

Please respond to the following questions on separate pages and attach this face sheet as the first page of your response. Your reply to the following questions will be of great help in the Healthy Hearing Quality Assurance Program. Thank you for taking the time to respond.

1. What was the number of athletes screened and total number of athletes at the event?
2. Did you receive the equipment on time?
3. Did you have any problems shipping it to its next destination? If so, what were the problems?
4. Did you have enough supplies?
5. Did you have enough volunteers? How many did you have?
6. Did you have enough space?
7. Was the HH location quiet enough for screening purposes?
8. Was there a steady flow of athletes?
9. Did you do air-and bone-conduction threshold testing of those failing pure tone screening? Where did you conduct these threshold tests? Was this space “quiet, how was it determined?
10. Did you have give-away gifts for each athlete?
11. Are you able to follow-up the athletes who failed the screening and/or showed a hearing loss by threshold testing? If so, how was it accomplished?
12. Did you enter the HH data in the HH Data Management System, or on the HH Data Tabulation form? Did you have any problems doing so? If so, please describe.
13. Did anything unusual occur at the event? Please describe.
14. What suggestions do you have for future events?

*Please remember to complete the analysis of your Healthy Hearing data on the HH Data Tabulation form, and email to pierce105@chapman.edu

Thank you for volunteering as a Healthy Hearing Clinical Director. Everyone associated with the Special Olympics organization much appreciates what you are accomplishing to help the SO athletes. You are making a better life for those who may have hearing losses or ear health conditions needing attention.

12/31/05
M/LH
Dehydration and Heat Stress

Volunteers need to be aware of how to avoid dehydration and heat stress. Whether you are working indoors or outside, it is easy to concentrate so much on your screening activities that you forget to drink water and become dehydrated.

The first symptom of dehydration is mental. You are not as alert, you don't think as clearly, and your reactions and judgement are affected. You probably won’t even realize that you need water and so you must depend upon your friends or teammates to notice that you are showing symptoms of dehydration. Please look out for each other! Please drink water throughout the day.

<table>
<thead>
<tr>
<th>Fluid Loss</th>
<th>Normal Temperatures</th>
<th>High Temperatures or Strenuous Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2%</td>
<td>Impaired judgement, irritability, headache, muscular aches</td>
<td>Sweating, flushed face</td>
</tr>
<tr>
<td>3%</td>
<td>Thirsty, fatigued, lacking energy, loss of appetite, tight sore muscles, more irritable, painful headache</td>
<td>Profuse sweating, impaired judgment, confusion</td>
</tr>
<tr>
<td>4-6%</td>
<td>Profound thirst, dizzy, muscle cramps, weakness, very tired</td>
<td>Very irritable, irrational, pale, severe headache at base of skull</td>
</tr>
<tr>
<td>7-8%</td>
<td>Nausea, vomiting, dizziness, irrational, staggering</td>
<td>Cold clammy skin, with high temp. May stop sweating.</td>
</tr>
<tr>
<td>9-10%</td>
<td>Collapse, very irrational, then unconscious</td>
<td>Pale skin, ashen cold and clammy, contracted tense muscles, pupils dilated, weak &amp; rapid pulse, shallow breathing, low blood pressure</td>
</tr>
<tr>
<td>10+%</td>
<td>Comatose, kidney failure</td>
<td></td>
</tr>
</tbody>
</table>

**Heat Stroke** (May or may not involve exertion—begins with dehydration)

Red, dry hot skin, (102-104 temp). Stopped sweating, severe headache, extremely weak, numbness in arms and legs, confusion, dark urine, contracted pupils, bounding pulse, shallow labored breathing.

Delirious, unconscious, then comatose. (American Red Cross, JACSM, 2004)
AnDx
Troubleshooting the Probe
580-OAESM1, 580-OAESM2, 580-OAESM3

Troubleshooting should be conducted whenever you get excessive artifact during testing, obtain poor results for all patients and/or get the following error messages: "Occluded probe? Refit and retry" or "Probe in ear? Refit and retry".

**STEP 1: Checking the probe cable connection**
- Disconnect the probe cable from the AnDx box.
- Inspect the round metal connector on the probe cable.
  - There should be 1 black plastic center piece surrounded by seven metal pins of approximately equivalent length. The black plastic piece should be approximately as long as the pins.
  - Inspect all of them, checking for broken or bent pins.
  - If a bent pin is found, gently push the pin back into place.
- If the pin(s) or the black connector are damaged, the probe cable, 580-OAESM1, 580-OAESM2, or 580-OAESM3 will need to be repaired and/or replaced.
- If the round connector on the AnDx box is damaged, you will need to either repair or replace the AnDx box.
- Reconnect the probe to the AnDx box, line up the probe cable connector (checking the pin alignment) properly with the round connector on the AnDx box.
- Firmly reconnect the probe to the AnDx box.
- Connect the AnDx box to a working wall outlet, using power supply (520-PS1211/2 or 520-PS1213)
- Insufficient battery output can cause probe errors.
- Check the small green LED on the front of the AnDx box to make sure it is illuminated.

If a problem is found with the probe connection, that has now been resolved, perform a test, referencing "Performing a test using the plastic cavity (instructions at back of guide)"

If the probe cable connection is good and the error messages "Occluded probe? Refit and retry" or "Probe in ear? Refit and retry" are still present or the initial problem was excessive artifact during testing, or refer results for all patients, proceed to **STEP 2**.

**STEP 2: Checking the probe body and flexible tubing**
- Inspect the probe body. All three metal tubes should be straight and have no significant gaps.
- If a problem is found with the probe body, replace part # 380-OAESB1.
- Inspect the clear flexible tubing for debris or holes.
  - If debris or holes are present, replace the tubing (part # 203501).
  - Do not cut the tubing as this could interfere with proper sound transmission.
  - Make sure the clear flexible tubing is connected well to speaker A and B on the speaker module and the two metal tubes of the probe body.
  - If a problem is found with the tubing, that has now been resolved, perform a test, referencing "Performing a test using the plastic cavity (instructions at back of guide)"
- If the error messages "Occluded probe? Refit and retry" or "Probe in ear? Refit and retry" are still present or the initial problem was excessive artifact during testing or refer results for all patients, proceed to **STEP 3**.

**STEP 3: Cleaning the probe**
Improper cleaning can result in damage to the microphone.
- The probe should be cleaned using the Bio-logic probe cleaner, part # 203501.
- Remove the disposable probe tip from the probe.
- Disconnect the microphone assembly from the probe body.
- Remove the clear flexible tubing from the metal sound delivery tubes on the probe body.
- Thread the Bio-logic cleaning tool, part # 203501, through all three metal sound delivery tubes on probe body until tubes are clear of debris. It is important to insert the cleaning tool from the back of the probe body to prevent debris from being pushed inward.
- Reinstall the probe.
- Perform a test, referencing "Performing a test using the plastic cavity (instructions at back of guide)"
- If the error messages "Occluded probe? Refit and retry" or "Probe in ear? Refit and retry" are still present or the initial problem was excessive artifact during testing or refer results for all patients, proceed to **STEP 4**.

**STEP 4: Checking the speaker module**
Place a probe tip on the end of the probe.
- Make sure the probe is connected securely to the box.
- Insert probe blindly into the plastic test cavity, part # 203500.
- Disconnect clear flexible tubing from the metal sound delivery tube labeled A on speaker module.
- Hold the metal sound delivery tube A close to your ear. Perform a test. Listen for a sound.
  - If no sound is heard, repair or replace probe cable, part # 580-OAESM1, 580-OAESM2, or 580-OAESM3.
  - If a sound is audible from the metal sound delivery tube A, reconnect the clear flexible tubing to the metal sound delivery tube A.
- Disconnect the clear flexible tubing from the metal sound delivery tube labeled B on the speaker module.
• Hold the metal sound delivery tube close to your ear. Perform a test. Listen for a sound.
• If no sound is heard, repair or replace the probe handle, part # 580-OAESM1, 580-OAESM2 or 580-OAESM3.
• If the error message "Probe ended? Retest and retry" or "Probe in ear? Retest and retry" are still present or the initial problem was excessive artifacts during testing or other results for all patients, proceed to STEP 5.

STEP 4:hecking the microphone
- Place a probe tip on the end of the probe.
- Make sure the probe is connected securely to the box.
- Insert probe snugly into the plastic test cavity, part #203900.
- Repeat STEP 3. Cleaning the probe. It is important to repeat this step as a small amount of debris lodged in one of the metal sound conducting tubes can cause a failure on this test.
- After repeating the probe, perform a test, referring to "Performing a test using the plastic cavity (Instructions at back of guide)."
- Wait for the LED display on the AudX box. A message "Check fit in progress..." should appear on the screen.
- If the error message "Probe in ear? Retest and retry" occurs immediately following the "Check fit in progress..." message, do the following:
  • Reconnect the clear flexible tubing to the metal sound delivery tube. Refit the OAE probe into the plastic cavity and repeat the test.
  • If the error message "Probe in ear? Retest and retry" occurs again immediately following the "Check fit in progress..." message, disconnect the clear flexible tubing from the metal sound delivery tube for speaker A on the probe body and reconnect it to the metal sound delivery tube for speaker B on the probe body. Alternately, disconnect the clear flexible tubing from the metal sound delivery tube for speaker B on the probe body and reconnect it to the metal sound delivery tube for speaker A on the probe body.
  • Repeat the test.
- If the error message "Probe in ear? Retest and retry" is still present, replace the microphone, part #580-OABEMP3, 580-OABEMP4 or 580-OABEMP4-1.
- If the AudX box passes the check fit stage properly, it will automatically log calibration and continue through the testing process, giving an overall REFER result. If the initial problem was excessive artifacts during testing and/or other results for all patients, proceed to STEP 6.

STEP 6: Performing a binaural check
• Select a subject with known good hearing who has previously gotten a pass result on the AudX.
• Place an appropriate adult-size ear tip in the subject's ear.
• Perform a test.
- If you have completed steps 1 through 5 and are still getting excessive artifacts and/or all patients give refer results, replace the microphones, part #580-OABEMP3, 580-OABEMP4 or 580-OABEMP4-1.

*Performing a test using the plastic test cavity:
- Place a probe tip on the end of the probe.
- Make sure the probe is connected securely to the box.
- Insert probe snugly into the plastic test cavity, part #203900.
- Perform a test.
- Observe the LCD display on the AudX box. You will see the AudX perform a check fit and calibration.
- The overall result should be a REFER. However, it would not be unusual to get a pass result at one of the individual frequencies.
- A REFER result would be consistent with a probe in good working condition.

BIO-LOGIC PART NUMBERS

<table>
<thead>
<tr>
<th>Speaker Modules</th>
<th>#580-OAESM1, 580-OAESM2, 580-OAESM3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replacement tubing</td>
<td>#203905</td>
</tr>
<tr>
<td>Microphone</td>
<td>#580-OABEMP3, 580-OABEMP4 or 580-OABEMP4-1</td>
</tr>
<tr>
<td>(a spare microphone is included with all new systems)</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>#520-PS12D3</td>
</tr>
<tr>
<td>Plastic test cavity</td>
<td>#203900</td>
</tr>
<tr>
<td>Probe cleaners</td>
<td>#203001</td>
</tr>
<tr>
<td>Probe body</td>
<td>#580-OABEMP1</td>
</tr>
</tbody>
</table>

If at any time during the troubleshooting process you require additional assistance, please contact the Audiology and Hearing Technical Support Department at (900) 342-8324.

580-AUDFB1
REV: B

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# Bio-logic Systems Corp.
## AuDX Oto-acoustic Emissions

## Troubleshooting Guide

### Cleaning the Probe
- Conduct visual inspection of probe before each use
- Clean probe if debris is noted
- Clean only the microphone port approximately every 50 tests even if debris is not noted

- **How to clean probe if debris is noted:**
  - Remove probe tip
  - Remove microphone
  - Remove clear tubing from probe body
  - Thread the green cleaning tool through all three metal tubes on probe body until the tubes are clear of debris
- If probe tip is clogged, use a new probe tip

- **Periodic cleaning of microphone port:**
  - Remove probe tip
  - Remove microphone plug from probe body
  - Thread the green cleaning tool from back to front through top port on probe body
  - Reconnect microphone

### Error Messages

<table>
<thead>
<tr>
<th>PROBE IN EAR? REFIT AND RETRY. OR OCCLUDED PROBE</th>
<th>MEMORY ERROR RELoad SOFTWARE or NO LOADER RELoad SOFTWARE or ERROR 000##</th>
</tr>
</thead>
<tbody>
<tr>
<td>✪ Clean probe (see instructions above)</td>
<td>✪ Detach printer cable or serial cable</td>
</tr>
<tr>
<td>✪ Verify secure connections of all cables and tubing</td>
<td>✪ Allow AuDX to power down. Then press ON button and initiate internal software installation</td>
</tr>
<tr>
<td>✪ Verify that no pins are bent or broken on round end of probe cable connector or round probe connection on AuDX box</td>
<td>✪ If the above does not work, use AuDX load program to reinstall software</td>
</tr>
<tr>
<td>✪ Verify that there is no damage to round probe connection on AuDX box</td>
<td>✪ Reconnect Probe cable into AuDX box</td>
</tr>
<tr>
<td>✪ Verify secure connection of microphone into speaker module</td>
<td>✪ Verify that clear probe tubing has no holes or tears, replace if necessary</td>
</tr>
</tbody>
</table>
### Error Messages (continued)

<table>
<thead>
<tr>
<th>EMPTY DATABASE</th>
<th>TURN PRINTER ON TRY AGAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>• When a new software version is uploaded from a computer to AuDX, the database of tests is erased from memory</td>
<td>• Verify that printer power is on</td>
</tr>
<tr>
<td>• When tests from AuDX II or AuDX Plus are uploaded to Scout software, they are deleted from the AuDX memory</td>
<td>• Verify secure cable connection from printer to AuDX</td>
</tr>
<tr>
<td></td>
<td>• Reload paper in printer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RESET DATETIME</th>
<th>PRINTER SKIPPING LABELS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Use AuDX load program</td>
<td>• Reload paper in printer</td>
</tr>
</tbody>
</table>

### Using the Test Cavity

+ Place a TreeTip on the Probe
+ Insert the probe securely into the test cavity
+ Perform test on AuDX as usual
+ Test results should show a "Refer"
+ If error messages are obtained, follow the troubleshooting suggestions above
+ A "pass" result may be observed at individual test frequencies in a DPOAE test due to the resonance properties of a hard walled cavity. But the overall test result should be a "refer".

---

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Authorized Representative:  
MDCI  
(Medical Device Consultants International)  
Independent House, Imberhome Lane  
East Grinstead  
RH19 1XT, United Kingdom
NORMAL

RANGE OF NORMALS

Ear Canal Volume
.2 → 2.0
(Actual size will vary with age and bone structure)

Gradient
60 - 150 child
50 - 110 adult

Compliance Peak
.2 → 1.4

Pressure Peak
-150 → +100

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ABNORMAL

GSI 37 AUTO TYMP
NAME
DATE
ECV: 1.0 cm³
GR: 135 daPa
PEAK: −195 daPa R

GSI 37 AUTO TYMP
NAME
DATE
ECV: 1.0 cm³
GR: N.P. daPa
PEAK: N.P. cm³

GSI 37 AUTO TYMP
NAME
DATE
ECV: 3.5 cm³
GR: N.P. daPa
PEAK: N.P. cm³

Normal Ear Canal Volume
Restricted Mobility
Abnormal Middle-ear Pressure
Borderline Wide Gradient
POSSIBLE CAUSE
Poorly Functioning Eustachian Tube
Possibly Some Fluid

Normal Ear Canal Volume
No Mobility
No Middle-ear Pressure
No Gradient
POSSIBLE CAUSE
Fluid-filled Middle-ear
(Serosus Otitis Media)
Compliance Peak May be Present at
a Much More Negative Pressure Than
−400 daPa

Abnormal Ear Canal Volume
No Mobility
No Middle-ear Pressure
No Gradient
POSSIBLE CAUSE
Open Perforation
Patent Pressure Equalization
(P-E) Tube

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VESTYS Neurocare, Inc.
Section 4 – TESTS RESULTS

4.1 EAR CANAL VOLUME

Ear canal volume information is helpful in verifying the validity of the test results and in distinguishing pathological conditions.

NORMAL

As a general rule, values for ear canal volume should be between 0.2 and 2.0 cm³. However, the normal values will vary within this range with age and bone structure. You will develop a feel for appropriate values as you use your GSI 37.

ABNORMAL

An ear canal volume of less than 0.2 cm³ indicates an abnormal condition and will be interpreted by the GSI 37 as an occluded probe. If the probe is plugged with cerumen or if the probe is positioned up against the ear canal wall, a smaller than expected value will be measured. Also, keep in mind that if the individual has a relatively large bone structure for his/her age group and a smaller than expected value is measured, the probe could also be occluded. Examine the tympanometric and gradient results to confirm your suspicions. If they appear abnormal as well, it is a good practice to repeat the test.

An ear canal volume greater than 2.0 cm³ also may indicate an abnormal condition. An important application of the ear canal volume measurement is to determine if there is a perforation of the tympanic membrane. If there is a perforation due to trauma or the presence of pressure-equalization (P-E) tube, the measured ear canal volume will be much larger than normal since the GSI 37 is measuring the combined volume of the ear canal space and the middle-ear space.

4.2 COMPLIANCE PEAK

NORMAL

The normal box on the GSI 37 (P11) has a compliance range of 0.2 to 1.4 cm³, reflecting the suggested range of normal compliance values for children and adults published by ASHA in their more recent guidelines for hearing screening. Since this range is intended to represent about 90% of all normal ears, there will be ears, especially in the adult population, with normal compliance greater than 1.4 cm³. However, these high compliance ears represent a minority. A measured compliance peak within the range of the GSI 37 normal box indicates normal mobility within in middle-ear system.

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ABNORMAL

A compliance values of less than 0.2 cm³ indicates a pathological condition, as the middle-ear system is stiffer than normal. To distinguish the probable cause of the stiffening, the pressure value where this stiffened compliance peak occurs is necessary. For example, normal pressure along with a stiff middle-ear system is indicative of a “glue-ear”, otosclerosis, a severely scarred tympanic membrane, or a layer of plaque across the tympanic membrane. On the other hand, abnormal pressure along with a stiff middle-ear system is consistent with a poorly functioning Eustachian tube with possible effusion (i.e., serous otitis mediate) within the middle ear.

NOTE

If the measured “peak” compliance value is less than 0.1 cm³, the GSI 37 may not display any indicator arrows on the compliance and pressure axes, although a shallow peak may be detectable on the display. If this tympanogram is printed, the letters NP will appear in place of the peak compliance and pressure values indicating that no peak was detected. Also in this instance, no gradient will be calculated, so three dashes (− − −) will appear under GR on the display.

A compliance value greater than 1.8 cm³ generally indicates a hyperflacid middle-ear system. Such a condition could be due to some moderate scarring on the tympanic membrane. However, if the compliance is greater than 3.0 cm³, this may be indicative of a disarticulated ossicular chain. Further testing may be necessary to confirm this condition.

NOTE

The validity of tympanometry is dependent upon a healthy tympanic membrane. A pathological condition at this membrane can mask the true condition of the middle ear.

4.3 PRESSURE PEAK

NORMAL

Strict rules for normal middle-ear pressure indicate a normal range of ± 50 daPa. However, for most applications, a normal pressure range of -150 daPa to +100 daPa is used.
ABNORMAL

Very rarely will you obtain an extreme positive pressure condition. Some researchers have reported high positive pressure at the onset of acute otitis media.

Pressure values more negative than -150 daPa are indicative of a poorly functioning Eustachian tube. The severity of this condition is determined by how negative the pressure is and its impact on the compliance peak.

If no peak is measured over the pressure range of the GSI 37 (i.e., +200 daPa to -400 daPa), then the GSI 37 will not display an indicator arrow on the pressure axis of the LCD. If this type of tymp is printed, the letters NP will appear in place of the peak pressure value, indicating that no peak was detected over this pressure range.

4.4 GRADIENT

NORMAL

Where the patient or test subject is a child, the normal range or gradient is between 60 and 150 daPa. (Infants may show higher gradient values due to the mobility of their entire ear canal.) For an adult subject, the range is narrower, and gradient values between 50 and 110 daPa are considered normal.

ABNORMAL

A high gradient value, i.e., one that falls outside of the normal ranges listed above, is most indicative of middle ear effusion. The reduced admittance values and negative middle-ear pressure characteristic of developing or resolving otitis media with effusion (OME) will be manifested in a broad tympanogram with a large gradient value. However, abnormal gradient values may also be found in the absence of other abnormal parameters. This could indicate a transient OME, so a retest after several weeks may be recommended.

When the middle ear’s mobility is reduced to near zero, due to a viscous effusion or a “glue-ear” condition, no gradient value can be measured, and the GSI 37 will display three dashes (− − −) in the gradient symbol area (P7).

Very low gradient values are associated with a flaccid middle-ear mechanism. These low values must be taken together with the ear canal volume and admittance peak values to determine the probable cause of the flaccid ear condition.

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4.5 SAMPLE TEST RESULTS

Figure 4-1 through 4-10 illustrate test results from sample GSI 37 Auto Tymp print-outs. The smoothness of the tympanogram tracing is determining by the amount of movement during the testing. Little or no movement during the testing provides a smoother tracing. Moving, talking or crying during testing leads to a more erratic-looking tracing but does not dramatically affect the test results.
2.3.3 TEST STATUS SYMBOLS

Prior to the start of a test, and periodically during instrument use, certain symbols may be displayed on the LCD to inform the operator of certain conditions and the required responses.

These symbols are as follows:

OPEN/READY – This appears when the ear-to-test has been selected using the L or R pushbutton to signify that the GSI 37 is ready to perform a test. When the test begins, this symbol is replaced by the emerging tympanogram.

LEAK – This appears when a large pressure leak exists. Remove the probe and restart the test.

OCCLUSION – This appears when the probe is occluded. Remove the probe and check it for obstructions, then restart the test.

ERROR – This appears when a system failure occurs that does not permit the probe to operate. Allow the GSI 37 probe to shut itself off, then try again to power up the probe by pressing the R (P4) or L (P1) pushbuttons. If the ERROR symbol reappears, call your local Grason-Stradler representative to schedule service on your GSI 37.

UNCORRECTED CAL – This symbol appears when the operator is in the special altitude calibration mode. See Section 2.5.5 for instructions on how to access and use this feature.

ALTITUDE CORRECTED CAL – This symbol appears when the operator is in the special altitude calibration mode. See Section 2.5.5 for instructions on how to access and use this feature.
Troubleshooting the Grason-Stadler GSI-37 Auto Tympanometer  
(See GSI-37 Instruction Manual for more information).

3.6 SPECIAL MESSAGES

Error code number and other “special messages” are either displayed or printed by the GSI 37 Auto Tymp. This occurs whenever an instrument error occurs, or in a few instances to apprise the operator of certain situations. These numbers and messages will appear on either the probe display or on the printout.

3.6.1 PROBE-RELATED CODES

The codes for probe-related errors will be displayed in the gradient area (P7) on the probe display accompanied by the error symbol. The following are system error codes that could be seen on the probe display:

```
E01  E09
E02  E11
E03  E13
E04  E14
E05  E51
E06  E59
E08  E60
```

Should any of the above error codes appear on the probe display, please repeat the operation that caused the error code to appear. If the error code appears for the second time, make a note of it and contact your GSI Service Representative, giving him/her the exact error code number.

Error code E12 indicates a low battery voltage. As explained in Section 2.5.1 the operator is alerted to recharge the batteries through the illumination of a low battery indicator arrow. Should you continue to test without recharging following this reminder, the voltage will continue to drop. Error code E12 is your last warning to recharge or replace the batteries. Otherwise, you will eventually reach a level at which testing is unreliable and the probe will completely shut off.

3.6.2 PRINTER/CHARGER CODES

The codes for printer/charger errors will appear on the printout. The following are system error codes that could be seen on your printout:

```
E01  E08
E02  E11
E03  E14
E04  E26
E05  E27
E06  E28
E07  E36
```

Whenever a printer/charger error is printed, repeat the operation that caused the error. If the error code appears again, call your GSI Service Representative and report the exact error code number as it is shown on the printout.

**NOTE**

A printer failure could prevent the printout of an error message. This can be detected by the data transfer LED flashing on and then off again in response to a print command without a printout occurring.

Error code E22 is a “communication error”. When this code appears, check that the probe is in its storage cradle and try the operation again.

Other special messages that could appear on your printout are “No Tests To Print” and “No New Tests To Print”. Explanations of these messages can be found in Sections 3.5.2 and 3.5.3.

*Used with permission of Grason-Stadler, a division of VIASYS Neurocare, Inc.*
<table>
<thead>
<tr>
<th>Station 1: Ear Canal Screen: O First</th>
<th>O Second Ear Canal Screen after Cerumen removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screener’s Name (print)</td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>Left</td>
</tr>
<tr>
<td>O Clear</td>
<td>O Clear</td>
</tr>
<tr>
<td>O Partially Blocked</td>
<td>O Partially Blocked</td>
</tr>
<tr>
<td>O Blocked</td>
<td>O Blocked</td>
</tr>
<tr>
<td>□ Follow-up needed</td>
<td>□ Follow-up needed</td>
</tr>
<tr>
<td>□ Refer for medical exam of retracted eardrum</td>
<td>□ Refer for medical exam of retracted eardrum</td>
</tr>
<tr>
<td>□ Reports upper respiratory infection or allergy</td>
<td>□ Reports upper respiratory infection or allergy</td>
</tr>
<tr>
<td>□ Foreign object in ear canal</td>
<td>□ Foreign object in ear canal</td>
</tr>
<tr>
<td>□ Perforation of ear drum</td>
<td>□ Perforation of ear drum</td>
</tr>
<tr>
<td>Unusual ear canal</td>
<td>Atretic ear</td>
</tr>
<tr>
<td>Atretic ear</td>
<td>Refer for Cerumen removal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Station 2: Otoacoustic Emissions Screen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screener’s Name (print)</td>
</tr>
<tr>
<td>Right</td>
</tr>
<tr>
<td>O Pass</td>
</tr>
<tr>
<td>O No Pass If No Pass, Go to Stations 3 and 4</td>
</tr>
<tr>
<td>Cannot achieve seal</td>
</tr>
<tr>
<td>Canal blocked by cerumen</td>
</tr>
<tr>
<td>Excessive noise</td>
</tr>
<tr>
<td>Athlete refused testing</td>
</tr>
<tr>
<td>Left</td>
</tr>
<tr>
<td>O Pass</td>
</tr>
<tr>
<td>O No Pass If No Pass, Go to Stations 3 and 4</td>
</tr>
<tr>
<td>Cannot achieve seal</td>
</tr>
<tr>
<td>Canal blocked by cerumen</td>
</tr>
<tr>
<td>Excessive noise</td>
</tr>
<tr>
<td>Athlete refused testing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Station 3: Tympanometry Screen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screener’s Name (print)</td>
</tr>
<tr>
<td>Right</td>
</tr>
<tr>
<td>O Pass</td>
</tr>
<tr>
<td>O No Pass</td>
</tr>
<tr>
<td>□ Ear Exam Recommended</td>
</tr>
<tr>
<td>Evidence of middle ear pathology</td>
</tr>
<tr>
<td>Large ear canal volume</td>
</tr>
<tr>
<td>Could not achieve seal</td>
</tr>
<tr>
<td>Athlete refused testing</td>
</tr>
<tr>
<td>Left</td>
</tr>
<tr>
<td>O Pass</td>
</tr>
<tr>
<td>O No Pass</td>
</tr>
<tr>
<td>□ Ear Exam Recommended</td>
</tr>
<tr>
<td>Evidence of middle ear pathology</td>
</tr>
<tr>
<td>Large ear canal volume</td>
</tr>
<tr>
<td>Could not achieve seal</td>
</tr>
<tr>
<td>Athlete refused testing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Station 4: Pure Tone Screen at 25dB Hearing Level (2000Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screener’s Name (print)</td>
</tr>
<tr>
<td>Right</td>
</tr>
<tr>
<td>O Pass</td>
</tr>
<tr>
<td>O No Pass</td>
</tr>
<tr>
<td>□ Hearing Eval Recommended</td>
</tr>
<tr>
<td>Good conditions for screening</td>
</tr>
<tr>
<td>Could not train to respond</td>
</tr>
<tr>
<td>Poor earphone fit</td>
</tr>
<tr>
<td>Excessive noise</td>
</tr>
<tr>
<td>Left</td>
</tr>
<tr>
<td>O Pass</td>
</tr>
<tr>
<td>O No Pass</td>
</tr>
<tr>
<td>□ Hearing Eval Recommended</td>
</tr>
<tr>
<td>Good conditions for screening</td>
</tr>
<tr>
<td>Could not train to respond</td>
</tr>
<tr>
<td>Poor earphone fit</td>
</tr>
<tr>
<td>Excessive noise</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Station 4: Pure Tone Screen at 25dB Hearing Level (4000Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screener’s Name (print)</td>
</tr>
<tr>
<td>Right</td>
</tr>
<tr>
<td>O Pass</td>
</tr>
<tr>
<td>O No Pass</td>
</tr>
<tr>
<td>□ Hearing Eval Recommended</td>
</tr>
<tr>
<td>Good conditions for screening</td>
</tr>
<tr>
<td>Could not train to respond</td>
</tr>
<tr>
<td>Poor earphone fit</td>
</tr>
<tr>
<td>Excessive noise</td>
</tr>
<tr>
<td>Left</td>
</tr>
<tr>
<td>O Pass</td>
</tr>
<tr>
<td>O No Pass</td>
</tr>
<tr>
<td>□ Hearing Eval Recommended</td>
</tr>
<tr>
<td>Good conditions for screening</td>
</tr>
<tr>
<td>Could not train to respond</td>
</tr>
<tr>
<td>Poor earphone fit</td>
</tr>
<tr>
<td>Excessive noise</td>
</tr>
</tbody>
</table>
### Station 5: Pure Tone Threshold Test

**Tester’s Name**

☐ Threshold Testing Done

<table>
<thead>
<tr>
<th>Test Frequencies</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>High</td>
</tr>
<tr>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>8000</td>
<td></td>
</tr>
<tr>
<td>Air-Conduction</td>
<td>O</td>
</tr>
<tr>
<td>Right</td>
<td>O</td>
</tr>
<tr>
<td>Left</td>
<td>O</td>
</tr>
<tr>
<td>Bone-Conduction*</td>
<td>O</td>
</tr>
</tbody>
</table>

*without masking* Key: D = Did Not Test C = Could Not Test

**Type of hearing loss, and degree of loss using better ear:**

- **O** Bilateral Sensorineural Hearing Loss
  - **O** Mild
  - **O** Moderate
  - **O** Severe
- **O** Unilateral Sensorineural Hearing Loss
  - **O** Mild
  - **O** Moderate
  - **O** Right
  - **O** Left
- **O** Bilateral Conductive Hearing Loss
  - **O** Mild
  - **O** Moderate
  - **O** Severe
- **O** Unilateral Conductive Hearing Loss
  - **O** Mild
  - **O** Moderate
  - **O** Right
  - **O** Left
- **O** Mixed Bilateral Hearing Loss
  - **O** Mild
  - **O** Moderate
  - **O** Severe
- **O** Mixed Unilateral Hearing Loss
  - **O** Mild
  - **O** Moderate
  - **O** Severe
  - **O** Right
  - **O** Left
- **O** Normal Hearing
  - **O** Right
  - **O** Left
  - **O** Both

### Services Provided At The Event

- **☐** Ear Canal Inspection
- **☐** Hearing Screening
- **☐** Middle Ear Screening
- **☐** Hearing Threshold Testing
- **☐** Hearing Aid Repair/Maintenance
- **☐** Ear Mold for Hearing Aid Right
- **☐** Ear Mold for Hearing Aid Left
- **☐** Hearing Aid Right
- **☐** Hearing Aid Left
- **☐** Noise Earplug Right
- **☐** Noise Earplug Left
- **☐** Swim Plug Right
- **☐** Swim Plug Left
- **☐** Counselling Athlete/Coach/Other
- **☐** Report to Athlete/Coach/Other
- **☐** Brochure Hearing Loss Athlete
- **☐** Brochure Hearing Loss Coach/Other
- **☐** Brochure Noise Athlete
- **☐** Brochure Noise Coach/Other

### Recommended Follow-up Care

- **☐** Cerumen Removal
  - **O** Right
  - **O** Left
  - **O** Both
- **☐** Medical evaluation of ears
- **☐** Audiological evaluation of hearing
- **☐** Ear molds for hearing aid use
- **☐** Hearing aid evaluation and fitting
- **☐** Hearing aid orientation program
- **☐** Aural rehabilitation program including auditory training and speech reading
- **☐** Noise Earplugs
- **☐** Swim Plugs

### Comments

---

**Signature of HH Clinical Director**

**Print Name of HHCD**

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Special Olympics  
Healthy Hearing Equipment Request Form

INSTRUCTIONS: Use this form if you are organizing a Special Olympics Healthy Hearing event and are not able to acquire the necessary hearing screening equipment locally or require additional units to augment what you have acquired locally—(i.e., Bio-Logic otoacoustic emission [OAE] units and Grason-Stadler [also known as VIASYS Healthcare] tympanometers and audiometers). Complete this form in its entirety (questions 1-18); omitted information will delay the fulfillment process. E-mail and/or fax the completed form to hearingequipment@specialolympics.org and/or 202.824.0200. Please read the detailed instructions on the second page of this form to ensure fulfillment of this request.

GENERAL INFORMATION

1. Today’s Date

2. Special Olympics Program Name*

3. List Healthy Hearing contacts below:

<table>
<thead>
<tr>
<th>Healthy Hearing Contact</th>
<th>Name</th>
<th>Phone</th>
<th>E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Director*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SO Program Contact*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Form Completed By*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EVENT & EQUIPMENT INFORMATION

4. Event Name

5. Event Location

6. Estimated # of Athletes*

7. Event Begin Date*

8. Event End Date*

9. Screening Date(s)*

10. Avg # of screeners per day

11. Equipment Need by Date*

12. Estimated # of OAE ear tips needed*

13. Number of Units Requested:
   - Bio-Logic OAE unit* (disposable ear tips included)
   - GSI 37 Auto Tympanometer* (standard supply of reusable ear tips included)
   - GSI 17 Audiometer w/ audio cups

14. Voltage Requirement:
   - [ ] 110
   - [ ] 220
   - [ ] Other

15. Were you able to acquire screening equipment locally? [ ] No [ ] Yes

16. Quantity of Units acquired Locally
   - OAE units
   - Tympanometers
   - Audiometers

17. Ship Equipment as follows: recipient will be held responsible for the equipment arriving at the venue (do not use P.O. Box)

18. Please indicate any special needs or steps SOI should take to facilitate respective customs processes.
   - [ ] Commercial invoice required; please fax
   - [ ] SOI Equipment letter Required
   - [ ] Other:

Comments:

FOR OFFICIAL USE ONLY

Date Request Received:

Anticipated Ship Date:

Number of Units Allocated:
   - OAE
   - Tympanometers
   - Audiometers

Confirmation Sent: [ ] 1 [ ] 2 [ ] 3
Special Olympics
Healthy Hearing Equipment Request Form

DETAILED INSTRUCTIONS: Use the Healthy Hearing e-mail address and/or fax for all communications concerning your equipment request to hearingequipment@specialolympics.org and/or 202 824 0200. Please DO NOT contact the manufacturers directly. If you have multiple events, please complete a form for each event.

Completed forms must be submitted prior to the “need by” date as follows: U.S. only—60 days; international (including Caribbean & Canada)---90 days; we cannot guarantee equipment fulfillment for submissions outside of these timeframes. Upon submission, you will receive 3 confirmations, as follows:

<table>
<thead>
<tr>
<th>Conf #</th>
<th>Expected Timeframe</th>
<th>Information Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Immediate (same day) after submission</td>
<td>thank you and acknowledge receipt</td>
</tr>
<tr>
<td>2</td>
<td>7 business days after submission</td>
<td>confirm order details and provide anticipated ship date</td>
</tr>
<tr>
<td>3</td>
<td>5 to 10 (U.S.) &amp; 20 to 30 (int'l) days prior to “need by” date</td>
<td>provide actual shipping information—ship to and return</td>
</tr>
</tbody>
</table>

Contact the following in case of equipment emergency: if you are a clinician, please contact global clinical advisor(s) (i.e., Dr. Beth Lannon, North America [including Caribbean and Canada] and Drs. Judy Montgomery or Gilbert Herer, International requests). If you are a Special Olympics Program staff person, please contact the

Please review the FYI section below for details concerning equipment, insurance, shipping and etc.

FOR YOUR INFORMATION

Please allow time to charge and do behavioral check on equipment before use. All units are to be returned promptly as designated in the final confirmation of your request. Bio-Logic and GSI (the manufacturers) donate to SOI shipping costs for units being shipped between venues. SOI pays for units being shipped back to the manufacturers only. If you are instructed to ship units between venues, air bills are included with the equipment. Please DO NOT discard enclosed air bills and DO hold on to the original shipment packaging. If you are returning equipment to the manufacturers, shipping information (i.e., carrier/account #) will be included with your final confirmation. Equipment being shipped to the manufacturers should be addressed as follows: To: Special Olympics Equipment Return; see addresses below.

<table>
<thead>
<tr>
<th>BIO-LOGIC, Inc.</th>
<th>GRASON-STADLER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Address</strong></td>
<td><strong>Address</strong></td>
</tr>
<tr>
<td>One Bio-logic Plaza</td>
<td>Viasys NeuroCare Group</td>
</tr>
<tr>
<td>Attn: Returns, Special Olympics</td>
<td>Attn: Returns, Special Olympics</td>
</tr>
<tr>
<td>Mundelein, IL 60060</td>
<td>2920 Commerce Park Drive</td>
</tr>
<tr>
<td>(800) 323-8326</td>
<td>Madison, WI 53719</td>
</tr>
<tr>
<td>(800) 323-8326</td>
<td>(608) 141-2523</td>
</tr>
<tr>
<td><strong>Equipment</strong></td>
<td><strong>Equipment</strong></td>
</tr>
<tr>
<td>Otoacoustic emissions units (Station 2)</td>
<td>GSI 37 Tympanometer w/ reusable earbuds</td>
</tr>
<tr>
<td>GSI 17 Audiometer</td>
<td>GSI 17 Audiometer w/ GSI Carry Case and audiocups (Stations 3 &amp; 4)</td>
</tr>
<tr>
<td><strong>Value of Equipment—USD:</strong></td>
<td><strong>Value of Equipment—USD:</strong></td>
</tr>
<tr>
<td>Bio-Logic OAE $2,604</td>
<td>GSI 17 Audiometer $1,035</td>
</tr>
<tr>
<td>GSI 37 Tympan $2,400</td>
<td>Audio cups $277.00</td>
</tr>
<tr>
<td>GSI Carry Case $128</td>
<td>power cord $73.05</td>
</tr>
</tbody>
</table>

Carnets (documentation used to readily move equipment with minimal customs issues) are used for Bio-Logic non-U.S. shipments. There are 6 OAE units to each carnets; these units must stay together and the carnets document must remain with the shipment, please do not discard or remove document from the packaging.

Insurance Information: While in use at events and during transport, Bio-Logic, GSI and SOI jointly carry insurance to cover hearing equipment for property damage or loss and damages due to business activities. **It is not necessary to acquire additional coverage per event.** As an FYI, per unit equipment value is listed below.

Healthy Hearing Manager at Special Olympics headquarters in Washington, D.C.
About Special Olympics Healthy Athletes

The Special Olympics Healthy Athletes® program is designed to help Special Olympics athletes improve their health and fitness and their ability to train and compete in Special Olympics through the provision of free health screenings and referral when necessary.

Objectives

• To improve access and health care for Special Olympics athletes at event-based health screening clinics;
• To make referrals to local health practitioners where appropriate;
• To train health care professionals and students about the needs and care of people with intellectual disabilities;
• To collect, analyze and disseminate data on the health status and needs of people with intellectual disabilities; and,
• To advocate improved health policies and programs for persons with intellectual disabilities.

Disciplines

• Special Olympics Special Smiles® (dental)
• Special Olympics-Lions Clubs International Opening Eyes® (vision)
• Special Olympics Healthy Hearing (audiology)
• Special Olympics FUNfitness (physical therapy)
• Special Olympics Health Promotion (health education)
• Special Olympics Fit Feet (podiatry)
• Special Olympics MedFest (sports physical examinations)

Healthy Athletes screenings are conducted at Special Olympics Games at all levels – local, state, country, region, world. Programs are supported by cash donations, significant in-kind donations of health equipment, products and volunteer health professionals and students, major cash sponsorships from organizations such as Lions Clubs International, and local support from many health-related organizations and industries.

Launched in 1996, Healthy Athletes has grown rapidly. In 2005, 535 screening events took place and nearly 125,000 athletes received at least one screening.

Clinical screening protocols utilized in the Healthy Athletes program are developed by leading professionals in their disciplines. A number of professional standards organizations have helped to develop or validate clinical screening procedures used in the Healthy Athletes program, including, for example, the U.S. Centers for Disease Control and Prevention, American Optometric Association, American Academy of Podiatric Sports Medicine, and American Physical Therapy Association.
Special Olympics, The Global Movement

With sports at the core, Special Olympics is a leader in the field of intellectual disability, making incredible strides in the areas of health, education, family support, research and policy change in over 150 countries worldwide. Today, Special Olympics is:

- More than 2.25 million athletes worldwide
- More than 200 Special Olympics Programs in more than 150 countries
- 30 Olympic-type summer and winter sports
- 7 regional offices around the world, including Belgium, Egypt, South Africa, India, China, Panama, and USA
- More than 700,000 volunteers
- More than 500,000 coaches
- Nearly 25,000 competitions around the world each year

Special Olympics Mission
To provide year-round sports training and athletic competition in a variety of Olympic-type sports for children and adults with intellectual disabilities, giving them continuing opportunities to develop physical fitness, demonstrate courage, experience joy and participate in a sharing of gifts, skills and friendship with their families, other Special Olympics athletes and the community.

Special Olympics Vision
The Special Olympics movement will transform communities by inspiring people throughout the world to open their minds, accept and include people with intellectual disabilities and thereby celebrate the similarities common to all people.

Benefits of Special Olympics
Individuals who compete in Special Olympics develop improved physical fitness and motor skills and greater self confidence. They exhibit courage and enthusiasm and build lasting friendships. These life skills enhance their ability to live satisfying productive lives. More than ever, Special Olympics athletes hold jobs, own homes, go to school and successfully confront life challenges on a daily basis.

Through millions of individual acts of inclusion where people with and without intellectual disabilities are brought together through Special Olympics programs, longstanding myths are dispelled, negative attitudes changed, and new opportunities to embrace and celebrate the giftedness of people with intellectual disabilities are created.

History and Leadership
Special Olympics began in 1968 with the First International Special Olympics Games at Soldier Field in Chicago. Since then, millions have benefited from the movement.

- Bruce Pasternack is President and CEO of Special Olympics.
- Timothy P. Shriver is the Chairman of Special Olympics Board of Directors.
- Eunice Kennedy Shriver is the Founder of Special Olympics and its Honorary Chairperson.
CALL TOLL-FREE
1-800-700-8585

WEB SITE ADDRESS:
www.specialolympics.org/healthyhearing