

Station 1: Check In

Procedure:

- ✓ Request athlete's data
- ✓ Questions regarding hearing: ask the athlete (not the coach) / no suggestive questions:
 - Do you think you have hearing loss?
 - Do you wear hearing aids? Which ear(s)?
If yes, do you have your hearing aid(s) with you?

After check-in:

- ✓ Guide the athlete with their screening form to the waiting area or a volunteer takes the athlete with them to Station 2: Otoscopy

Station 2: Otoscopy

Procedure:

- ✓ Wear gloves
- ✓ Perform otoscopy in each ear
- ✓ Use same speculum for both ears, unless visible infection or blood in first ear
- ✓ Plastic ear specula = garbage bag
- ✓ Metal ear specula = box to clean and disinfect/sterilize

Note regarding results:

- ✓ Take note of any abnormality of the pinna, in the ear canal or at the ear drum. Let the decision on the necessity of referral for these abnormalities be made by the Clinical Director.

Remarks:

- If additional otoscopic findings are observed, please select all applicable options.
- Findings related to earwax or foreign bodies will be documented, with one of the following categories selected:
 - Minimally blocked: greater than 50% visibility
 - Partially blocked: approximately 50% visibility
 - Blocked: less than 50% visibility

Follow-up questions will be generated based on the selections made above.

Next step:

- ✓ After otoscopy, all athletes continue to station 3 (OAE), regardless of results, unless contra- indication UNLESS there is an optional station

Optional Station: Removal of Earwax and/or Foreign Body

Procedure:

- Wear gloves. The Clinical Director or ENT may remove earwax, if necessary, after informing and obtaining consent from the athlete.
- A second volunteer assists, reassures the athlete, records findings on the screening form, and ensures all lines are completed.
- Store used materials separately in labelled boxes for regular disinfection/sterilization.
- Guide athletes to Station 3 (OAE) or assign a volunteer to do so, except if there is significant ear discharge or other contraindications.



explain and show



remove



check



Comments: Guidelines for cerumen management

- Seek advice from the Clinical Director or ENT if needed; use this opportunity to learn.
- Allow the Clinical Director or ENT to remove ear wax if necessary.
- Let the Clinical Director decide if a referral is needed for reasons other than excessive ear wax.
- Use a video-otoscope, if available, to show the athlete or coach the reason for referral.
- Clearly document any contraindications on the screening form. Excessive ear wax is not a contraindication, even if the ear canal is completely blocked.

Station 3: OAE Screening

Procedure:

- ✓ Wear gloves
- ✓ Perform OAE screening in each ear
- ✓ Use the same foam ear tip for both ears, unless visible infection or blood in first ear
- ✓ Foam ear tip = garbage bag

Note regarding results:

PASS = PASS on screening unit

NO PASS = REFER on screening unit

UNABLE TO TEST = if OAE screening not possible + check one of the reasons why
= NO REFERRAL NEEDED

Next step:

- ✓ If bilateral "pass" → check-out
- ✓ If unilateral or bilateral "refer" / "no pass" → station 4 (tympanometry) and 5 (pure tone audiometry), unless contra-indication

Station 4: Tympanometry Screening

Procedure:

- ✓ Wear gloves
- ✓ Perform tympanometry in each ear
- ✓ Use the same ear tip for both ears, unless visible infection or blood in first ear
- ✓ Used ear tips □ box to clean and disinfect

Note regarding results:

PASS = all values within the values of the normative data

NO PASS = type B-tympanogram or at least one of the numeric results outside of the normative data

UNABLE TO TEST = If tympanometry not possible + check one of the reasons at last column
= NO REFERRAL NEEDED

Normative data for tympanometry: ("rule of 2")

PASS = admittance between 0.20 and 2 mmho
middle ear pressure between +20 and -
200daPa ear canal volume between 0.60
and 2 ml

NO PASS =

type B (flat)

type C (under pressure) with pressure more positive than +20 daPa or more negative than - 200daPa

type As with value for admittance < 0.20 mmho

type Ad with value for admittance > 2 mmho ear canal volume <0.60 ml or > 2 ml

Comments:

- ✓ Note type of tympanogram when "no pass", this way Clinical Director can decide on follow-up recommendations.
- ✓ Type D-tympanogram, without any further abnormalities on otoscopy = "pass"
- ✓ When unilateral or bilateral "no pass" on tympanometry, but all other screening results are normal, then the athlete will not be referred for follow-up, unless the Medical Doctor or the Clinical Director at the event decides otherwise.

Next step:

- ✓ After tympanometry, all athletes continue to station 5 (Pure Tone Screening at 25dB HL), regardless of results.

Station 5: Pure Tone Screening at 25dB HL

Procedure:

- ✓ Test frequencies: 2000 and 4000Hz (ear by ear)
- ✓ Intensity level: 25dBHL = "pass"
- ✓ Interrupted (pulsed) tones
- ✓ Screening procedure: starting level = 50dBHL → 35dBHL (if response at 50dBHL) → 25dBHL.
- ✓ Requested response = raise hand; play audiometry if needed
- ✓ Short training and/or conditioning if needed
- ✓ Disinfect headphones before using with new athlete

Note regarding results:

PASS = reliable response at 25dBHL

→ check-out if 4x "pass" (both frequencies in both ears)

NO PASS = no (reliable) response at 25dBHL, or athlete refused testing

→ station 6

Next step:

- ✓ If 4 times PASS → check-out
- ✓ If NO PASS for at least 1 of the 4 frequencies → station 6 (threshold testing with pure tone audiometry)

Station 6: Pure Tone Threshold Testing

Procedure:

- ✓ Test frequencies air conduction: 250, 500, 1000, 2000, 3000, 4000 and 6000Hz
- ✓ Test frequencies bone conduction: 250, 500, 1000, 2000, 3000Hz, 4000Hz, 6000Hz
- ✓ Mask if necessary and possible
- ✓ Determine hearing threshold, ear by ear, also for ear with "pass" at pure tone screening

Note regarding results:

Record responses, indicate if NR was obtained, note any masking used, and assess test result reliability.

Comments:

- ✓ Test as many thresholds as possible for air and bone conduction. If attention or reliability decreases, try to test at least 1 threshold for bone conduction (1000Hz).
- ✓ Ask for assistance if needed.

Station 7: Check Out

Goal:

- ✓ Check if all parts of the screening form are completed (correctly) before data input (= quality control).
- ✓ Check screening results for follow-up care recommendations.
- ✓ Make individual follow-up care recommendations if necessary.
- ✓ Give general ear and hearing screening advice.
- ✓ Explain screening results, recommendations and general advice to the athlete, their coach, carer, or family.
- ✓ Complete screening form and referrals.

Procedure:

Screening results and recommended follow-up care are explained to each athlete, who also receives advice on regular ear and hearing checks. All details are documented on the HH recommendation form and provided to the athlete.

About half of the athletes will receive follow-up recommendations because of possible ear and/or hearing problems. A good recommendation can only be made if the athlete went through all their required screening stations and when all parts of the screening form are completed correctly.

- *Step 1 = every screener:*
 - ✓ Checks if the screening form is completed correctly for their station.
- *Step 2 = Healthy Hearing Clinical Director*
 - ✓ Checks screening form before any recommendations are given or before data entry.
 - ✓ Checks if the athlete went to all necessary stations.
 - ✓ Checks if screening form is complete; if screening results are unclear then ask the volunteer who performed the screening (name can be found on the screening form) to check and/or complete the results.
 - ✓ Checks the necessity for swim plugs and/or hearing aid repair and maintenance.
 - ✓ Makes individual follow-up recommendations, based on the screening results.
 - ✓ Completes the final part of the screening form: "extra services provided at the event" and "recommended follow-up care"

- ✓ Completes the "Recommendation form":
- ✓ Explains the screening results and the individual recommendations to the athlete, their coach, carer and/or family.
- ✓ Explains the necessity of regular ear and hearing screening to the athlete.
- ✓ Gives the recommendation form to the athlete.
- ✓ Give a thank you present to the athlete for attending the screening, if available.
- ✓ Keep the original HH-screening form at the check-out desk.

Recommendation forms:

Every athlete receives a recommendation form in their own language whenever possible. This form contains the different screening tests done, the individual recommendations for follow-up care, and the general advice for regular ear and hearing screening. The original screening forms must stay at check-out for data entry.

There are 2 different recommendations forms:

- ✓ For athletes with clear ears and hearing screening pass results, who does not need any follow-up recommendations = PASS SCREENING FORM
- ✓ For athletes with possible ear and/or hearing problems, who receive follow-up recommendations = NO PASS SCREENING FORM

Optional Station: Hearing Aid Maintenance and Repair

The program can only provide hearing aid maintenance and repair services

Goal: For Program to check for maintenance and repair of hearing aids.

Materials: Program should secure necessary materials and supplies for basic maintenance and repair of different types of hearing aids e.g., listening tube, cleaning wipes and tools; replacement ear mold tubes and scissors, glue and threading tools or different sized domes, hearing aid hooks and microphone covers – all for common hearing aid models. Spare hearing aid batteries of different sizes e.g., 13, 312, 675.

Procedure: *If Program is conducting hearing aid maintenance and repairs*

The volunteer at check in or a screener has informed one of the clinical volunteers that an athlete has their hearing aid(s) with them. The clinical volunteer asks the athlete, and if possible, also his coach/carer, for permission to check the hearing aids at the end of the screening.

One clinical volunteer will check and carry out necessary maintenance of the hearing aid(s) at an optional station right before check-out/education station.

- ✓ Take note of the name and identification number of the athlete.
- ✓ Clean the ear molds and the hearing aids.
- ✓ Check the hearing aid visually and with a listening device. Replace flat batteries and tubing, etc. if necessary and possible.
- ✓ Explain to the athlete and his coach/family what you have done and what you advise.