North Carolina State Hearing Aid Dealers and Fitters Board

Part A: Instructions for Simulator Exam

General Instructions

1. Exam Time Limit: 60 Minutes (beginning February 2024). Pass Criteria: a maximum number of 3 Critical Errors or 5 Recording Errors (see Grading Rubric).

2. A symbol key is not printed on the audiogram form provided to you at the examination. However, after the exam starts, you may use the blank page provided by the proctor to hand-write the symbol key and other notes. You may not bring notes of any kind into the testing site. Any cheating will result in automatic failure.

3. You will record the pure-tone air and bone conduction thresholds obtained during the simulation for each ear at the frequencies of 500 Hz, 1000 Hz, 2000 Hz, 3000 Hz, and 4000 Hz, using the symbols listed in 21 NCAC 22I .0111.

4. All programmed simulator audiograms involve measurement of thresholds using supra-aural earphones. For simulation purposes, the minimum interaural attenuation for air-conduction is 40 dBHL and for bone conduction is 0 dBHL.

5. Audiometric Threshold: The audiometric threshold is the lowest hearing level an individual can hear a signal at least 50% of the time, if and only if, 5dB above that level the signal is heard 100% of the time.

How to obtain an Audiometric Threshold

1. Start in the better ear. If you don't know which ear is the better ear, start in the RIGHT ear.

2. Each time a tone is introduced, it should be presented for one to two seconds.

3. Start at 1000 Hz; present a tone at 30 dBHL; if no response, increase the level to 50 dBHL; if no response, continue to increase the level in 10dB steps until you get an "INITIAL" response.

4. The initial response is verified by obtaining a response at 5 dBHL above the level of the initial response.

5. Begin the bracketing technique by decreasing the level in 10 dBHL steps each time a response is observed and increasing the level in 5dB steps when a response is not observed.

6. You must obtain a minimum of 3 positive responses to achieve a valid threshold.

7. Using the same procedure described in steps 4 – 7, continue to obtain hearing thresholds in the following order: 2000 Hz, 3000 Hz, and 4000 Hz, retest 1000 Hz, and 500Hz. If the re-tested threshold at 1000Hz is more than 5 dBHL different than the initial 1000 Hz threshold, you must re-check the thresholds for 1000 Hz, 2000 Hz, 3000 Hz and 4000 Hz. The re-check procedure is required only for the initial ear, air conduction threshold.

   HINT: False positive responses may be built into the program to simulate real-life testing situations. False positive responses may occur up to 5% of the time.

Rules for Masking

1. **Limits of the Audiogram Simulator:**

    110 dB Air Conduction testing
    65 dB Bone Conduction testing

2. **Criteria for masking Bone Conduction:** Mask the test ear for bone-conduction when there is a 15 dBHL or more difference between the Air Conduction threshold of the test ear and the BEST Bone Conduction threshold, regardless of ear (assuming 0 dBHL minimum interaural attenuation).

3. **Criteria for masking Air Conduction:** Mask the test ear for air-conduction when there is a 40dBHL or more difference between the Air Conduction threshold of the test ear and the BEST Bone conduction threshold, regardless of ear (assuming 0 dBHL minimum interaural attenuation).

How to Mask for Air and Bone Conduction Testing

1. The initial level of masking presented to the non-test ear is determined by adding 10 dBHL to the threshold level of the non-test ear. *For example, if the threshold for the non-test ear is 30 dBHL, the initial masking level for the non-test ear would be 40 dBHL.*

2. Re-establish threshold in the test ear with this initial amount of masking in the non-test ear.

3. Each time there is a response to the pure tone signal presented to the test ear, increase the masking presented to the non-test ear by 5 dBHL.

4. Each time the person does not respond to the tone presented to the test ear, increase the signal in 5dB HL steps until another response is obtained.

5. Continue the procedure until the masking can be increased by three (3) consecutive 5dB steps without producing a shift in the threshold level of the test ear. When this is accomplished, a "plateau" in threshold response has been reached.

6. At this point, record the masked threshold on the audiogram using the appropriate symbol for masking.