

Module 4

Occupational Audiometry Testing

Evaluate the Type of Occupational Audiogram

Chapter 12

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Chapter Outline

Reliability criteria	Validity criteria
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Educational Aims

After studying this educational content, you should be able to:

- ✓ Evaluate the type of occupational audiogram
- ✓ Evaluate the reliability aspects recorded on the audiogram
- ✓ Evaluate the validity aspects recorded on the audiogram

Occupational Audiometry Testing

Introduction

An employer is required to establish, maintain and document a system of medical surveillance as per NIHL regulation¹ and the Guideline for a mandatory Code of Practice for an occupational health programme for noise². It should be a planned, ongoing programme of audiometric testing including baseline, entry, periodic, monitoring, initial and exit audiometry. This occupational health surveillance plan is implemented with the support of an OMP. Each audiogram should be evaluated to ensure that it is reliable and valid audiograms. When audiograms are reliable, it implies that the quality of the audiograms are trustworthy and performing consistently well. This indicates that the result of the measurement, calculation or specification can be depended on to be accurate and with repeat testing the same result will be achieved. Validity indicates that the audiogram is acceptable according to legislative requirements.

Reliability criteria

As part of the hearing conservation programme, and to ensure reliable and valid audiometric tests, audiometric testing should be conducted by a competent person as described in the NIHL Regulation¹ and SANS 10083:2021³. Each occupational health audiogram has the same reliability criteria but different validity criteria to ensure legal compliance. See Table 12.1 for the different types of audiograms in occupational health with their specific validity criteria which need to be adhered to as per NIHL Regulation¹ and SANS 10083:2021³. The reliability criteria, which are applicable to all audiograms, are also listed in this table.

The following reliability criteria is applicable to all audiograms done in the occupational setting. If these criteria are not adhered to, it renders an invalid audiogram:

- ✓ Conducted by a competent person – in South Africa, audiometrist should be registered with the Department of Employment and Labour. This registration process is managed by SASOHN.
- ✓ An otoscopic examination – if any otopathology is present, it should be treated successfully before audiometric testing commence
- ✓ Audiometric history – all information with regards to demographics, occupational history (current and past), medical history, surgical history, trauma history, hereditary history and recreational history, especially applicable to the ear, nose and throat should be included and recorded with the interview
- ✓ Correct test environment – adhere to all acoustical environmental conditions as stipulated by SANS 10182⁴
- ✓ Use of reliable equipment with regards to
- ✓ Type – a minimum standard of Type 4 audiometer should be used
- ✓ Maintenance – equipment should be maintained, software updated as required
- ✓ Calibrations – electro-acoustic, biological, and daily functional tests should be conducted.

Occupational Audiometry Testing

Validity criteria

In order to comply with legislation, it is essential to meet specific validity criteria for various types of audiograms in the occupational setting. These criteria are determined by the relevant legislation and must be adhered to. The following aspects should be checked for validity:

- ✓ Number of Audiograms
- ✓ Previous exposure to industrial noise
- ✓ Noise free verification
- ✓ Date of employment
- ✓ Date of termination
- ✓ Setting and sitting of audiometric test
- ✓ Comparing hearing threshold levels
- ✓ PLH result
- ✓ Temporary Threshold Shift
- ✓ Interval time of tests
- ✓ Report management



Occupational Audiometry Testing

Occupational health audiogram reliability and validity criteria

Table 12.1: Audiogram classification in occupational setting and their respective reliability and validity criteria

RELIABILITY							
<ul style="list-style-type: none"> ✓ Conducted by a competent person ✓ An otoscopic examination – treat all otopathology before testing ✓ Audiometric history ✓ Correct test environment ✓ Use of reliable equipment with regards to <ul style="list-style-type: none"> • Type • Maintenance • Calibrations 							
VALIDITY							
Validity criteria per type of audiogram	Baseline (BL)	Milestone Baseline	Entry level	Periodic	Monitoring	Exit	Diagnostic
Nr of Audiograms	2	2	2	1	1	1	2
Can be done if the employee was exposed to industrial noise previously	No	No	Yes	Yes	Yes	Yes	Yes
16 hrs Noise free period without HPD	Yes	Yes	Yes	Yes	Yes	Yes	No
16 hrs Noise free period with HPD	No	No	No	Yes	Yes	Yes	No
24 hrs Noise free period without HPD	N/A	N/A	N/A	N/A	N/A	N/A	Yes
Done within 30 days of employment	Yes	Yes	Yes	No	No	No	No
Same day, Same setting, Two different sittings – 5 min apart	Yes	Yes	Yes	N/A	N/A	N/A	No
Same day, Two settings, and Two different sittings – 5 min apart	No	No	No	N/A	N/A	N/A	Yes
HTL ≤ 10dB at 0.5kHz, 1kHz, 2kHz, 3kHz and 4kHz between 2 audiograms	Yes	Yes	No	N/A	N/A	N/A	No

Occupational Audiometry Testing

Validity criteria per type of audiogram	Baseline (BL)	Milestone Baseline	Entry level	Periodic	Monitoring	Exit	Diagnostic
HTL ≤ 10dB at 0.5kHz, 1kHz, 2kHz, 3kHz, 4kHz, 6kHz and 8kHz between 2 audiograms	N/A	N/A	Yes	N/A	N/A	N/A	Yes
Lowest PLH regarded as best audiogram	Yes	Yes	N/A	N/A	N/A	N/A	Yes
Repeat after 16 hrs if validity criteria are not met or abnormal result was	Yes	Yes	Yes	Yes	Yes	Yes	Yes
If valid audiograms cannot be established refer to audiologist	Yes	Yes	Yes	N/A	N/A	N/A	N/A
Done as close to exit date or within the last 6 months	N/A	N/A	N/A	N/A	N/A	Yes	N/A
Intervals	Once only	Baseline and each new company	Each new company	Annual ≥85dB(A) to 104dB(A) and biannually ≥105dB(A)	6 monthly	On exit	As requested , and with 10% shift from BL
Copy to be given to employee	Yes	N/A	N/A	N/A	N/A	Yes	N/A
Conducted by	Audio-metrist / audiologist	Audio-metrist / audiologist	Audio-metrist / audiologist	Audio-metrist / audiologist	Audio-metrist / audiologist	Audio-metrist / audiologist	Audiologist / ENT