



# Audiometry Service



Changi  
General Hospital



**Hearing problem affects people of all ages. Good hearing is essential to everyone. It is important for people to recognise it early so that they can receive the help that is available.**

At Changi General Hospital (CGH), the audiology department offers a variety of hearing tests. Our highly qualified audiologists can provide you with a holistic hearing service.



Audiometry is a method to test the hearing threshold of an individual. It diagnoses the type (low, middle or high frequency) and severity (mild, moderate, severe and profound) of hearing loss in a person.

*This test includes:*

- Mechanical sound transmission (external and middle ear function)
- Neural sound transmission (cochlear function)
- Speech discrimination (central integration)

*This testing will determine:*

- Hearing threshold
- Discriminate sound intensity
- Recognise pitch

## Types of audiometrical procedures:

### Pure Tone Audiometry

This is the most common test used to detect hearing loss. Audiograms are produced using a piece of test equipment called an audiometer, and this allows pure tones of different frequencies to be presented to the subject, usually using headphones, at any specified level.

The test involves different tones being presented at a specific frequency (pitch) and intensity (loudness). When the person hears the sound they raise their hand or press a button so that the tester knows that they have heard it. The lowest intensity sound they can hear is recorded.

## Speech Audiometry

Similar procedure as pure tone audiometry, but it utilises human speech instead of pure tones. It gives information about a person's ability to hear and understand speech. The test consists of a certain number of words presented via headphones to a patient, who is required to repeat the words. After finishing the test, a percentage of the number of words that were correctly repeated can be derived.

This test helps to evaluate how much intelligibility is left in a person as a result of hearing loss and allows the evaluation of the improvement in intelligibility by means of hearing aids, implants or surgery. It also allows the comparison of intelligibility differences between different hearing instruments.

## Impedance Audiometry

This involves 2 tests:

*Tympanometry* determines the resistance of the tympanic membrane and middle ear. The secondary purpose of this test is to evaluate acoustic reflex pathways, which include cranial nerves (CN) VII and VIII and the auditory brainstem. This test cannot be used to directly assess auditory sensitivity, although results are interpreted in conjunction with other threshold measures.

*Acoustic Immittance* (acoustic reflex testing) is a measurement of energy or air pressure flow, which involves the ear canal, eardrum, ossicular chain, tensor tympani, stapedius muscle, cochlea, CNs VII and VIII, and the brainstem. Mass, mobility, and resistance of the outer and middle ear systems affect this test.

## Evoked Response Audiometry

Evoked response audiometry is an objective test to measure an electrical signal evoked from the brainstem by the presentation of a sound such as a click. It is a screening test to monitor for hearing loss or deafness, especially notable for its use with newborn infants.

It is a method employed to assess the functions of the ears, cranial nerves, and various brain functions of the lower part of the auditory system. The procedure is to generate a brief click or tone pip from an earphone or headphone and measuring the elicited neuronal action potentials by surface electrodes, typically placed at the the scalp and ear lobes. Evoked response audiometry is a safe and painless test of auditory pathway and brainstem function in response to auditory or (click) stimuli.

## Videonystagmography - VNG

VNG is to determine whether or not dizziness maybe due to inner ear disease. We conduct a series of tests to determine the cause of a patient's dizziness.

- Saccade Test, evaluate rapid eye movements
- Smooth Pursuit Test, eyes movement as they follow a visual target
- Positional Test, measure dizziness associated with positions of the head
- Caloric Test, measures responses to warm and cold water introduced through a small, soft tube in the ear canal

## Noise Induced Deafness Prevention Programme (NIDPP)

This Programme aims to reduce the incidence of Noise-induced Deafness (NID). The target of this programme includes workplaces with noise hazards in the manufacturing, shipbuilding / ship-repairing and construction sector, through a series of outreach and enforcement activities. Key elements of the in-plant HCP include noise monitoring, noise control, hearing protection, audiometric examinations and health education.

Initiatives under this programme include:

- Strengthening legislative requirements
- Identifying noisy workplaces for surveillance and control
- Managing noise hazards at workplaces through the implementation of in-plant Hearing Conservation Programme (HCP)
- Raising awareness and building capability in noise hazard management
- Certification by registered Designated Factory Doctor (DFD)

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