

Online hearing tests: How are these used and how effective are they?

While a hearing test completed in the convenience of your own home may be attractive as an alternative to making an appointment to see an audiologist, the tests and equipment currently available has never been approved by the U.S. Food and Drug Administration (the federal agency that is responsible for ensuring medical equipment and devices are approved for their stated usage). The accuracy of online hearing testing for purposes of diagnosing a medical hearing loss is highly suspicious and unlikely to be accurate or reliably identify the extent of your hearing problems.

A face-to-face examination of you and hearing is the best practice and the following sections are components of such an examination:

Medical history and current conditions:

The audiologist will ask you many questions about your current and past medical and physical history, especially as it relates to your hearing abilities. There are many physical conditions that can impact your hearing status or your hearing problems can make other medical conditions worse. Also, there are many medications that can affect your hearing and your audiologist will ask about these as well. Additionally, if you are experiencing ear noise (tinnitus), balance problems such as dizziness or vertigo, are exposed the hazardous loud sounds recreationally or through your work or have any other hearing- and balance-related issues, the audiologist will address these with you in the face-to-face examination. This cannot happen through your computer by an online hearing test that will only focus on a small component of your overall hearing health!

Otoscopic examination:

As part of the overall hearing evaluation, it is mandatory that the audiologist assess your ears (with an otoscope - a lighted, magnifying device) to determine if obstructions like occluding ear wax are present in the ear canal. This important part of the examination is not possible in a self-administered examination in your own home. Further, the audiologist can help to identify other potential medical problems through this external ear examination such as drainage or bleeding in the canal or even identification of abnormal skin rashes or bumps in or around the ear that may require further medical examination.

Equipment used to test hearing:

The American National Standards Institute (ANSI) has published guidelines that specify the acceptable level of ambient (local and ongoing) room noise allowed for an accurate hearing test. It is rarely possible to meet these standards without a uniquely constructed, sound-treated room. It is imperative to control for background noise when evaluating an individual's hearing thresholds as background noises in your home including roadside traffic, computer monitors and ventilation systems (just to name a few) may produce noise that will artificially elevate (increase) your hearing levels when completing a hearing test online at your computer.

Clearly, having one's hearing tested in a sound-treated room is not a realistic environment in which to identify the problems a person with hearing loss has in everyday listening situations, but in a sound-treated room, the baseline hearing (or best possible hearing) can be identified. This baseline hearing then helps the audiologist understand the extent of the loss. Just as measuring one's 'resting' pulse or 'resting' blood pressure would avoid over-treatment for 'high blood pressure', it is important that a baseline of the hearing be measured accurately.

Additionally, there are strict standards for headphone or earphone calibration in the audiologist's practice that do not exist for home computer systems. Varying test results from the same individual on the same home computer using different kinds of headsets/earphones have been made. So there is simply no way to know the specifications or capabilities of the in-home earphones.

Types of hearing test results:

Hearing tests completed online (using earphones that go into or cover the ear) measure only a single aspect of the hearing system through sound that enters the ear canal (referred to as 'air conduction' testing). Air conduction testing evaluates a patient's hearing sensitivity for different pitches. The results from this type of testing will tell you 'how much' hearing loss you have or how normal your hearing is. It cannot determine, in the presence of a hearing loss, 'where' along the auditory system the hearing loss exists. That is, there can be a problem in the ear canal or with the ear drum (or the bones attached to the drum) or there can be a problem in the inner ear (the sensory organ for hearing) or there can be a problem with the auditory nerve. Air conduction testing does not determine where the abnormality may occur in the hearing system and therefore is only part of a comprehensive hearing evaluation. However – through online testing, only air conduction results can be obtained. At a minimum, an additional test of hearing sensitivity using 'bone conduction' testing is needed to determine 'where' the hearing loss is located. Specialized equipment is necessary to evaluate hearing through bone conduction testing (testing completed through the use of a specialized headset that can measure sound that is transmitted through bone!). This equipment is not available for home computer systems. Bone conduction testing is the only way to determine if the individual has a medically treatable hearing loss or one which would benefit from amplification.

Hearing losses that occur when something blocks the ear canal (like wax, for example), or something causes a hole or perforation to occur in the eardrum is referred to as a 'conductive' hearing loss. When these kinds of conditions exist, the sound from the outside world is not 'conducted' correctly to the inner ear (sense organ for hearing). Some conductive hearing losses can be medically treated and can only be identified through a comprehensive face-to-face examination.

Alternatively, when there is damage to the inner ear – such as damage caused by repeated exposure to loud sounds (noise-induced hearing loss) or damage to the inner ear caused by the natural aging process (called presbycusis), this results in a 'sensorineural' hearing loss. These losses are not typically medically treatable and again, this type of loss can only be identified with a comprehensive face-to-face examination. Some people even have a combination of these types of hearing losses (conductive and sensorineural). An online hearing test will not be able to distinguish between these types of losses so it is an imperative that you see an audiologist in order to determine not only how much hearing loss you have but to determine the kind of hearing loss you have.

Same head, two ears, different results:

Some individuals may have a difference in hearing between their ears. When this difference in hearing between the ears is sufficient enough, the better (hearing) ear may actually hear the sound through the earphones used at home rather than the ear that is actually being tested. This is referred to as 'crossover' – whereby a sufficiently loud sound will 'cross-over' and be heard in the non-tested ear but it will seem like it is being heard in the ear being tested. An audiologist can easily identify this "crossover" phenomenon and can implement testing procedures to ensure that the tested ear responds. Online computer equipment cannot accommodate for these differences in hearing and that will lead to inaccurate results.

A comprehensive diagnostic hearing evaluation completed by an audiologist in a sound-treated environment that meets current testing standards is necessary to ensure hearing test accuracy and to ensure appropriate treatment and management options are provided to you.