

# ENT NEWS

## A Service of the Ear, Nose, & Throat Center, PC

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### OTOACOUSTIC EMISSIONS

What can otoacoustic emissions be used for?

Background. Otoacoustic emissions (OAEs) were just reported in 1978. Not only could the cochlear (inner ear) serve to transduce acoustic energy to the brain, it also produced sound that could be detected in the external auditory canal and could be used to assess inner ear function. The OAEs are thought to be generated in the outer hair cells of the cochlea and are probably part of the amplifier mechanism to enable the inner hair cell to be more sensitive to soft sounds.

Clinical Significance of OAE. The measurement of OAEs allow for the evaluation of auditory disorders by assessing the cochlea (inner ear) relatively independent of eighth nerve function and higher auditory structures. OAEs can be divided into transiently evoked otoacoustic emissions (TE OAE) and distortion product otoacoustic emission (DPOAE). Both of these are used clinically in different situations and compliment each other. The test is frequency specific.

#### Applications

Neonatal screening. The test is fast, noninvasive, easy to perform and objective. The emissions can be measured in a few minutes and done in the first week of life in the hospital or as an outpatient.

Other children at risk. May be used to assess hearing in children with speech delay, positive family history, congenital, neonatal infections, anatomic deformity in the head and neck, low birth weight, hyperbilirubinemia and low APGARs.

Confirmation of hearing loss in children or adult. The OAE results at specific frequencies will parallel the audiogram and positive results indicate thresholds better than 40dB. Middle ear status (fluid, tube present, or ossicular problem) will influence the results. Inconsistency suggest need for further assessment.

Acoustic Neuroma. The presence of OAE and significant hearing loss would be suggestive of retrocochlear lesion such as acoustic neuroma.

Ototoxicity. Since ototoxic drugs affect the outer hair cells, OAEs are a sensitive tool to detect subclinical changes in the function of the organ of Corti (inner ear). Therapeutic regimes could be adjusted to decrease toxicity. Otoacoustic emissions and their measurement is an extremely exciting tool in medicine to be used in the diagnosis and treatment of ear diseases.

OAEs are currently available at the Ear, Nose and Throat Center.