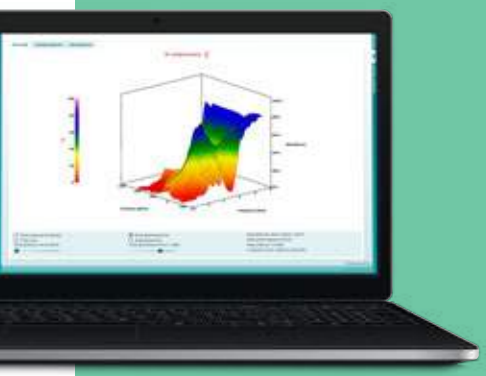
Science **made** smarter

Wideband Tympanometry

Tympanometry **made** complete



A new dimension in middle ear diagnostics

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Audiometry | **Tympanometry** | ABR | OAE | Hearing Aid Fitting | Balance

Why do Wideband Tympanometry?

Easy and very reliable middle ear evaluations of infants, children, and adults.

Comprehensive analysis of the middle ear
With a simple probe "click" that covers the 226 to 8000 Hz range instead of a probe tone that only measures at 226 Hz, hundreds of tympanograms are visualized in an illustrative 3D landscape. With a single pressure sweep (as in traditional tympanometry) Wideband Tympanometry allows comprehensive analysis of middle ear status over a frequency range that includes the full speech spectrum.

Specific components of the recording can be displayed individually for ease of interpretation, such as the classic 226Hz tympanogram, the 1kHz tympanogram, an averaged WB tympanogram, the tympanogram at resonance frequency, and absorbance measures as a function of frequency.

Measures absorbance
The ability to measure absorbance is like having a "second opinion" in addition to a traditional tympanogram. It shows the acoustic energy absorbed into the middle ear as a function of frequency. Research shows that different middle ear pathologies effect the absorbance of acoustic energy into the middle ear in various ways. The clinician can compare the absorbance measurement with overlaid normative data and sketched examples of various pathologies.

Terminology: Alternative terms used by researchers for WBT include WAI (Wideband Acoustic Immittance) and PR (Power Reflectance).

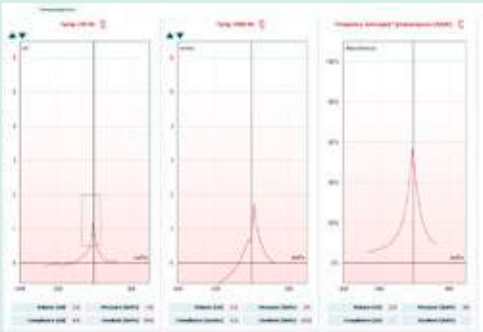
Highlights:
- Increased clinical confidence and patient care
- Assists in differential diagnosis
- Quick and simple to operate
- Allows efficient monitoring of middle ear status over time

Absorbance can be evaluated with some loss of predictive power at tympanometric peak pressure, or it can be recorded without applying air pressure to the ear which might be preferred post surgery.

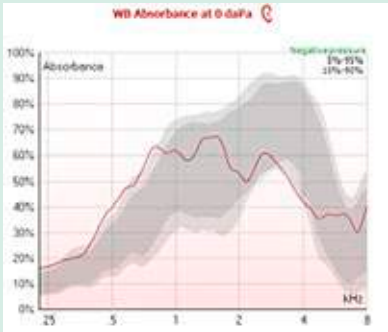
Assists in differential diagnosis
Through the measurement of absorbance, Wide Band Tympanometry yields information that helps to differentiate between normal middle ear function and middle ear pathologies such as fluid, otosclerosis, disarticulation of the ossicular chain, tympanic perforations, semicircular canal dehiscence, etc.[1]. Some of these pathologies are impossible to confirm reliably with only traditional tympanometry.

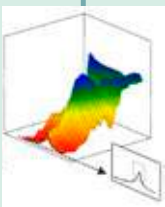
[1]*Energy reflectance and tympanometry in normal and otosclerotic ears, Shanaz et al. (April 2009). Ear and Hearing, 30 (2), 219-33.*

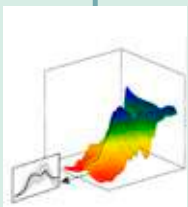
All classic tympanograms can be extracted from the 3D tympanometry recording. A new diagnostically powerful averaged wideband tympanogram is also available.

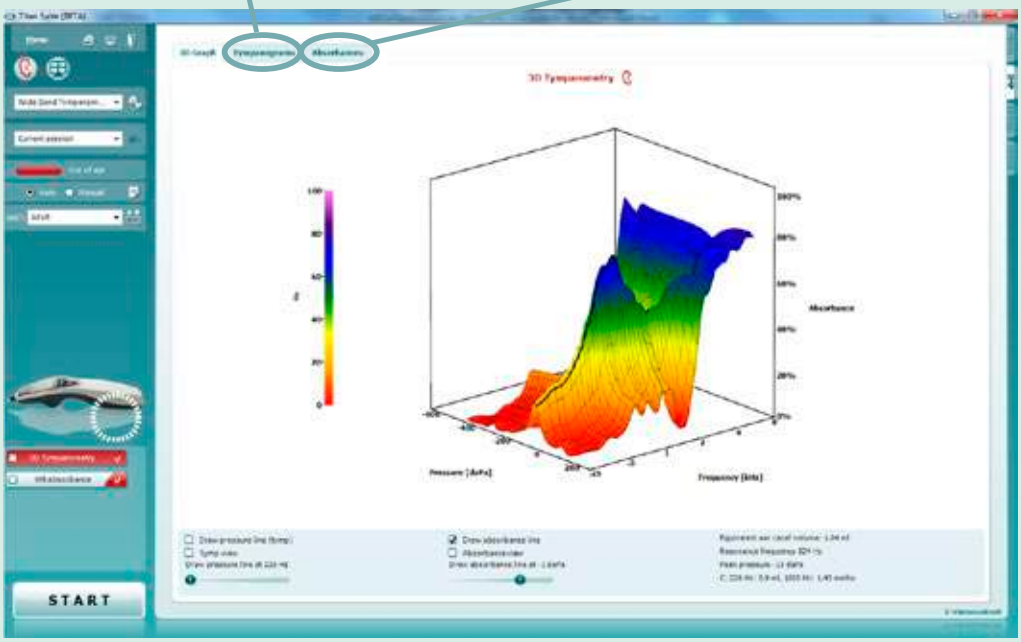


Normative data built into the absorbance graph allows the clinician to easily detect middle ear pathology.









Relevant articles:

"WAI identified CHL well in all populations. In infants and children, WAI in several single-frequency bands identified CHL with equal accuracy to measures of middle ear admittance using clinical tympanometry with a single probe tone (1000Hz for infants; 226Hz for children and adults). When WAI was combined across frequency bands, it identified CHL superior to traditional, single-frequency tympanometry.
"Prediction of Conductive Hearing Loss Using Wideband Acoustic Immittance".
Beth A. Prieve, M. Patrick Feeney, Stefan Stenfelt, and Navid Shahnaz.
Ear and Hearing, 2013/34Supplement.
"A historical perspective helps one appreciate that the measurement of wideband acoustic absorbance is not a totally new procedure. Rather, it is the latest enhancement to aural acoustic-immittance measurement. An enhancement that can expand one's ability to characterize middle ear function and effects of ear disease on that function.
"Wideband Acoustic Immittance Measurements of the Middle Ear: Introduction and Some Historical Antecedents".
David J. Lilly and Robert H. Margolis
Ear and Hearing, 2013/34Supplement.
"PR measurements in conjunction with audiometric measurements of air-bone gap have promise in differentiating among stapes fixation, ossicular discontinuity, and superior semicircular canal dehiscence".
"Assessment of Ear Disorders Using Power Reflectance".
Hideko Heidi Nakajima, John J. Rosowski, Navid Shahnaz, and Susan E. Voss.
Ear and Hearing, 2013/34Supplement.

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1878

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1969

Tympanograms available

1978

ABR commercially available

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OAE becomes available

2013

Wideband Tympanometry with absorbance and 3D tympanograms available on the Titan from Interacoustics

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