

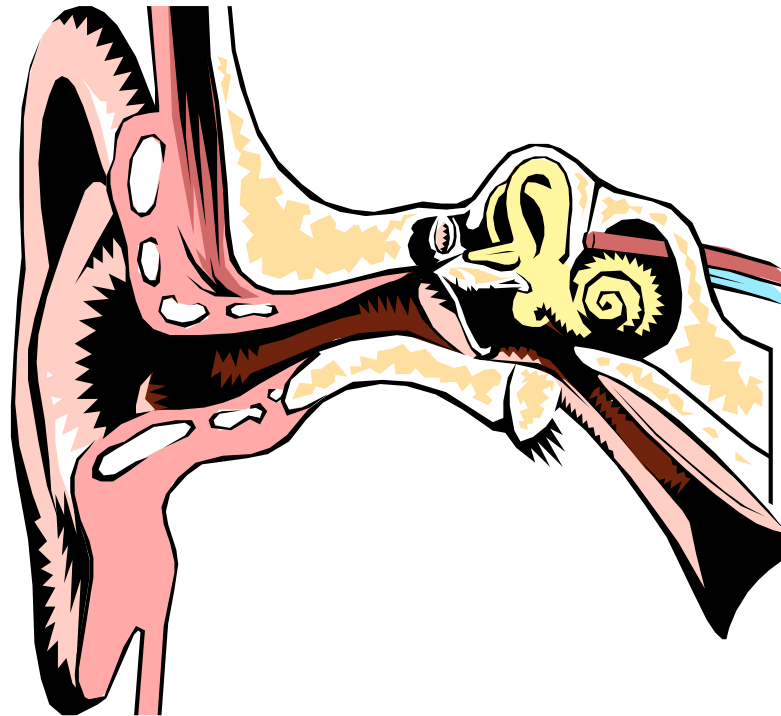
Introduction to Tympanometry

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Definition

- Tympanometry measures the compliance of the TM and ossicular chain and estimates middle ear pressure.
- Compliance = Freedom of Movement (cc)

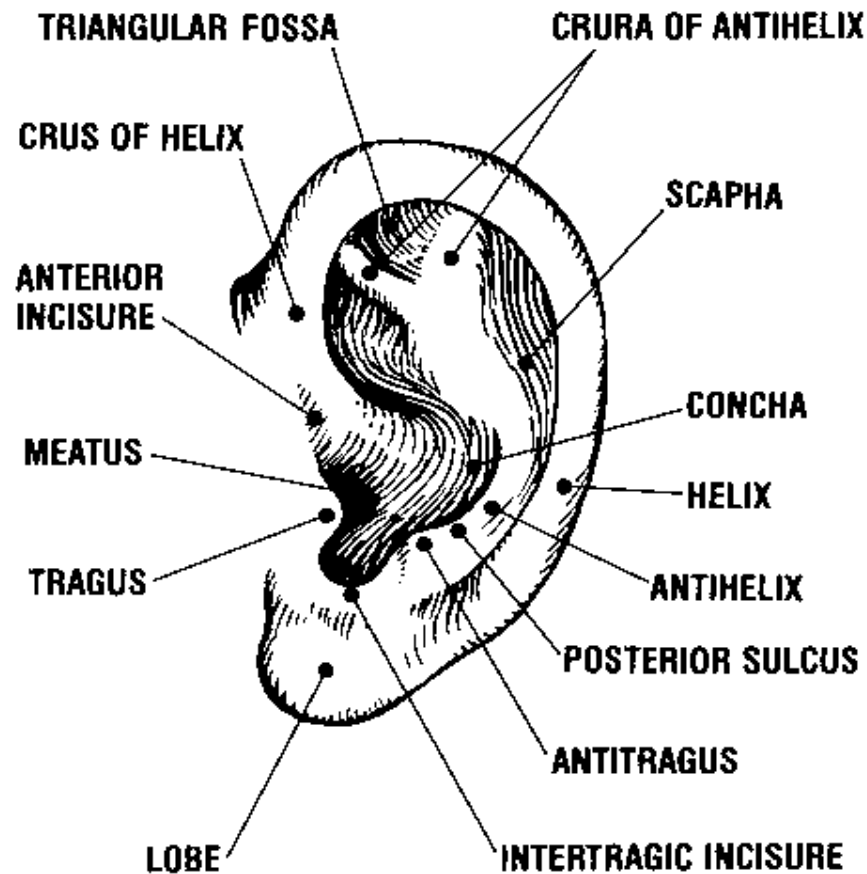
Anatomy of the Ear



Anatomy of the Ear

- External Ear
 - Middle Ear
 - Inner Ear
 - Pinna
 - Auditory Canal
 - Tympanic Membrane
- Ossicular Chain
 - Malleus
 - Incus
 - Spapes
 - Stapedial Muscle
 - Oval Window
 - Cochlea

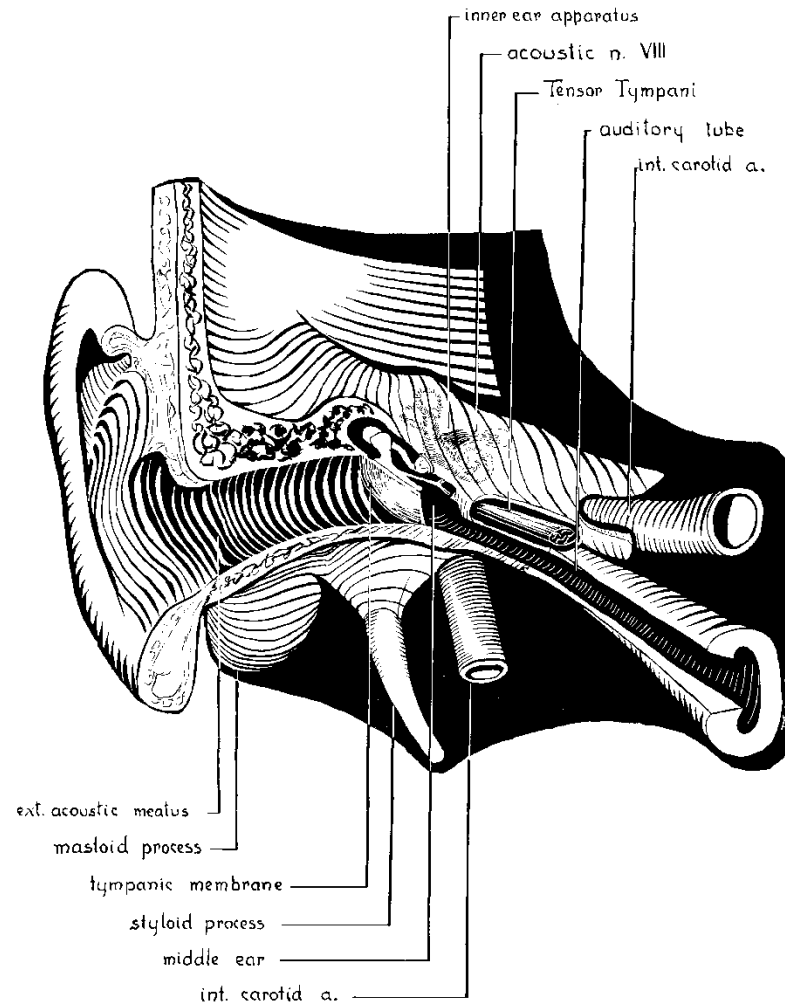
External Anatomical Landmarks of the Ear



Hearing

- Sound energy stimulates the TM (eardrum) vibrating the ossicular chain. Vibratory motion of the stapes is transmitted through the oval window into the cochlea.
- Cochlea translates the sound energy into meaningful neuronal impulses to the brain.

Cranial Nerve VIII



How it Works

Tympanometry utilizes two energy sources:

- Pressure
- Sound

Units:

1. Pressure = daPa (deca Pascals)
2. Sound = Hz (Frequency) dB (Loudness)
3. Compliance = cc

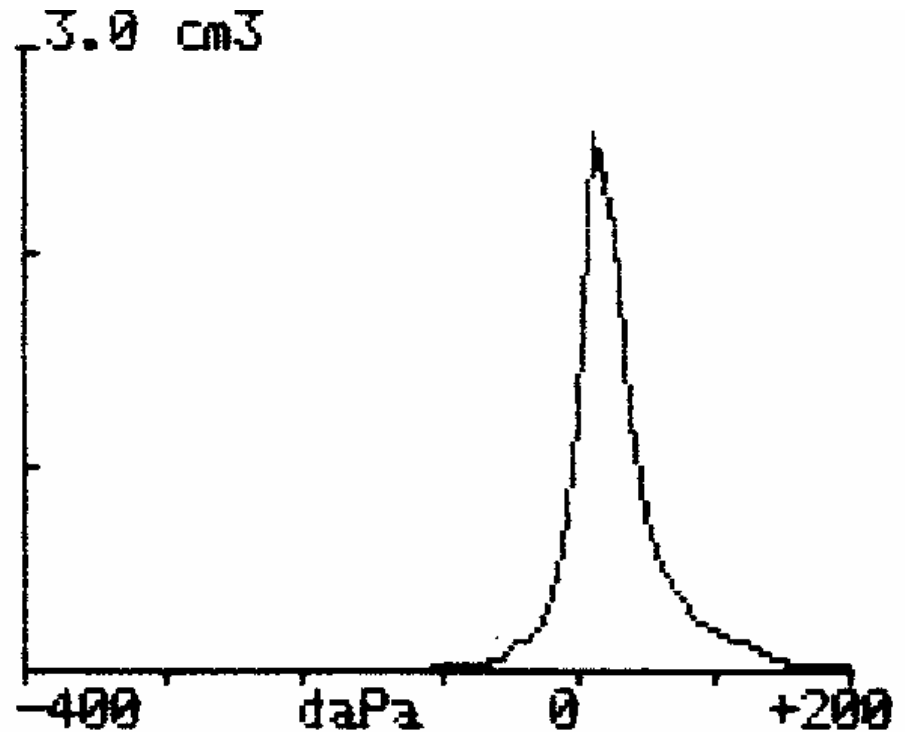
How it Works

- Pressure is introduced from +200 to – 300
- Sound is constant at 226 Hz and 85 dB
- Compliance is measured in terms of volume (cc)



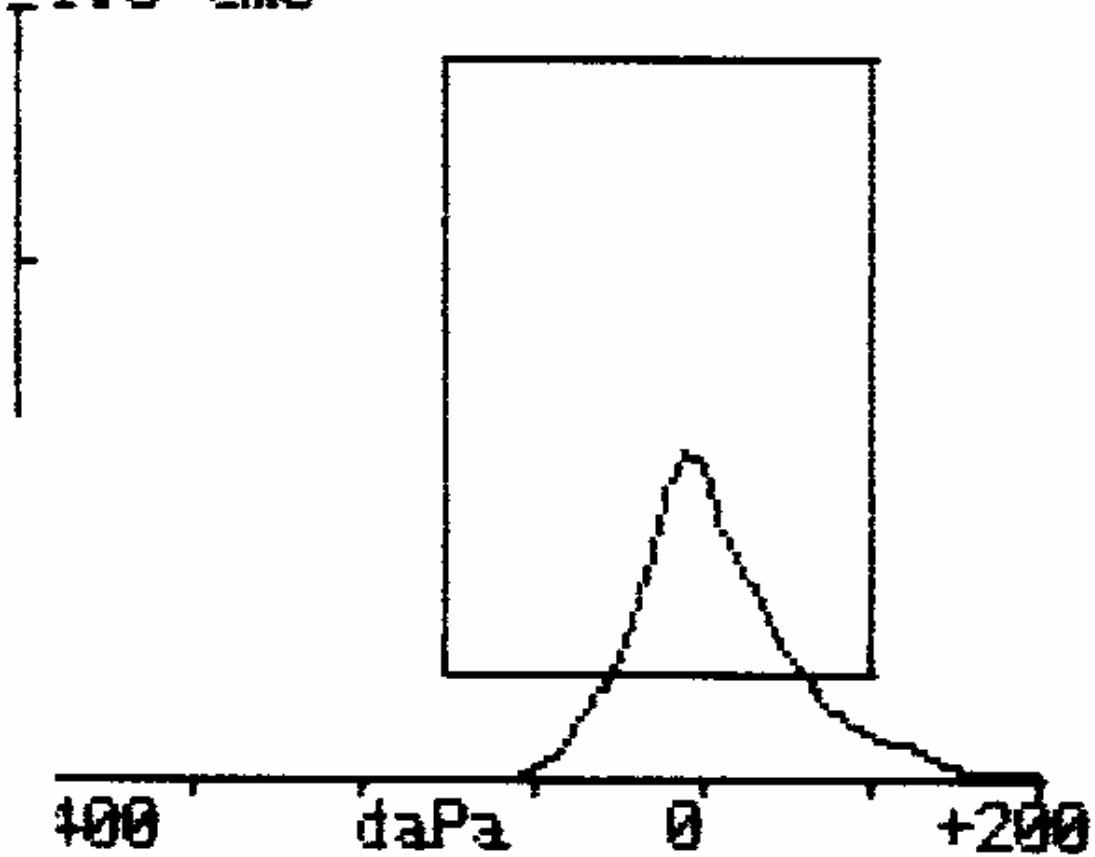
How it Works

- Pressure changes on the x-axis (horizontal)
- Compliance changes on the y-axis (vertical)

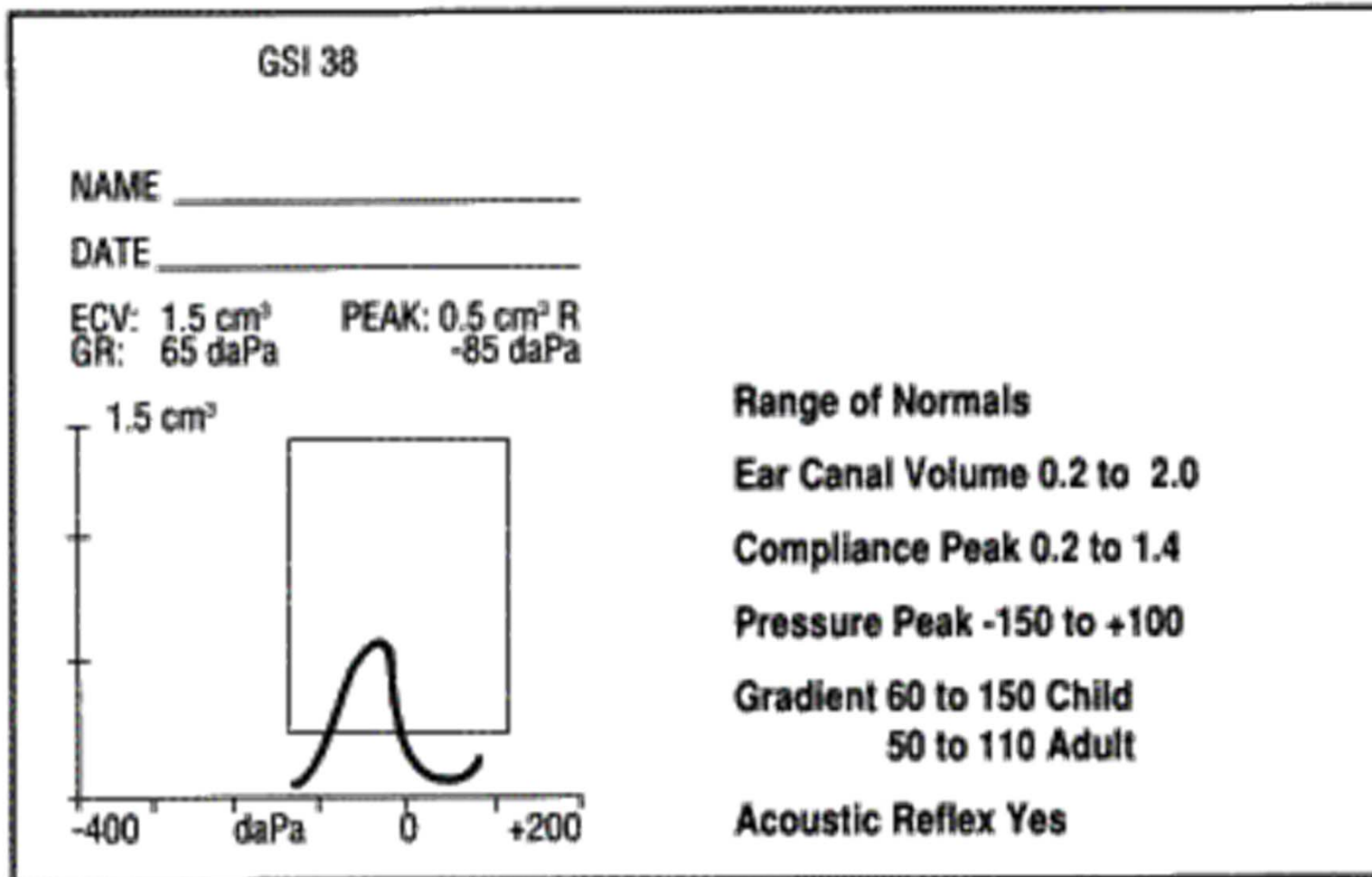


Values

ECU 1.7 cm³ PEAK 0.7 cm³ L
GR 79 daPa - 10 daPa
1.5 cm³



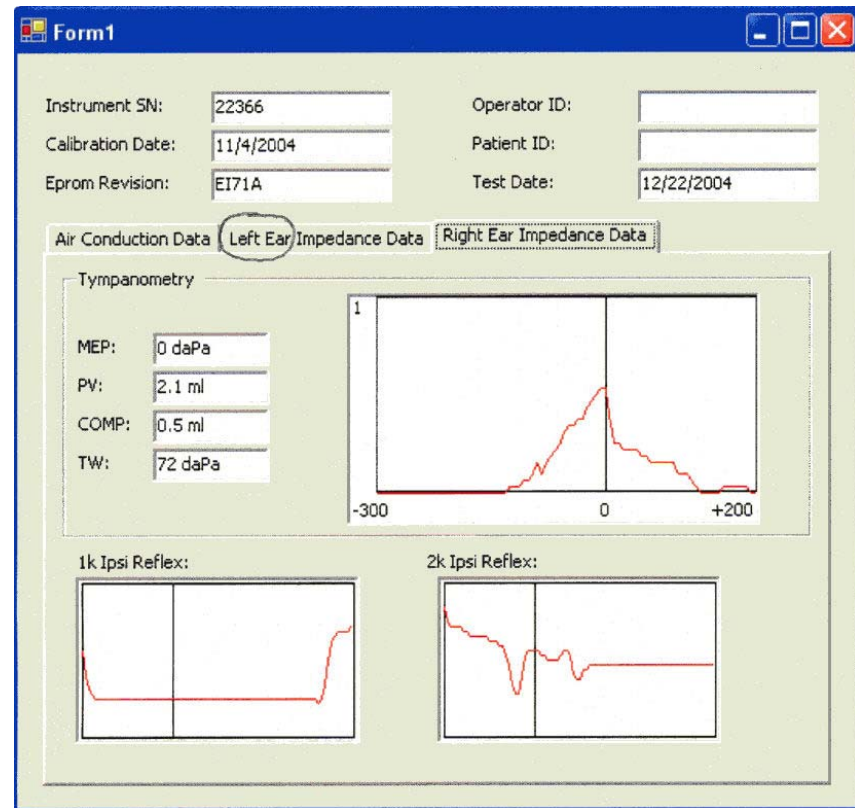
Values



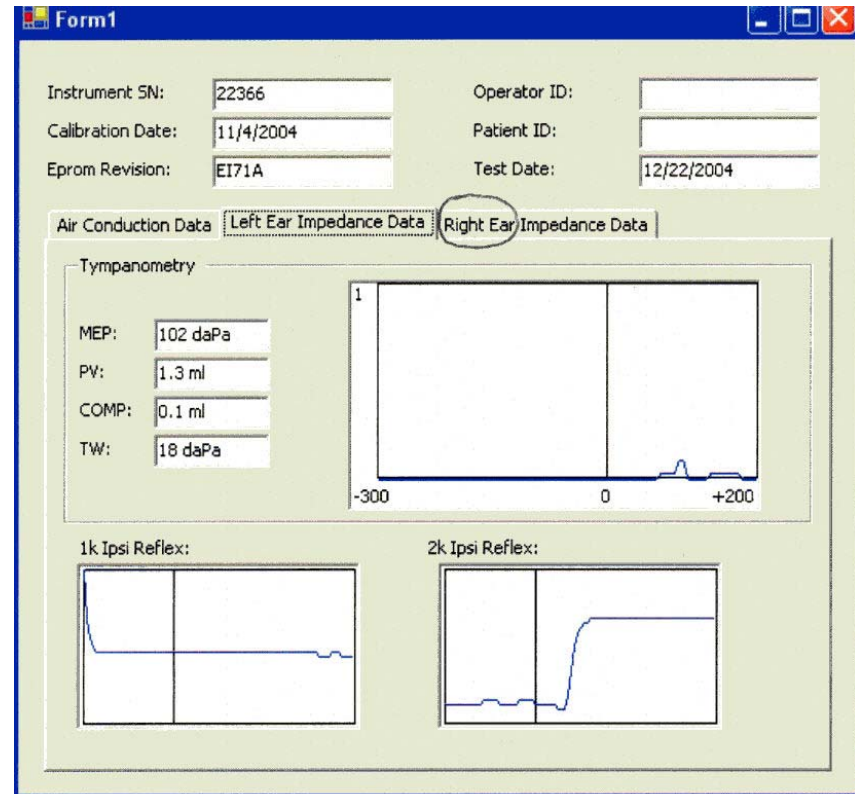
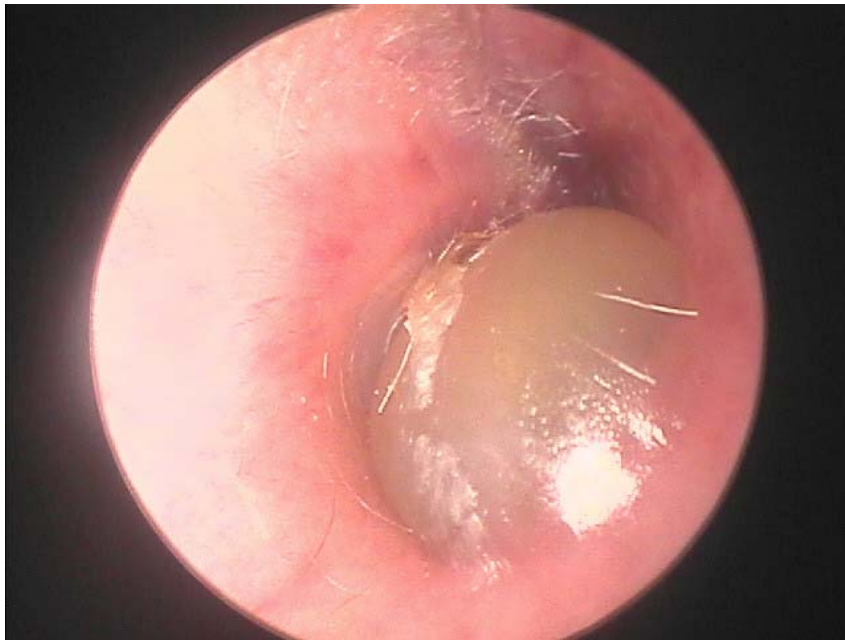
Clinical Indications

- Nonspecific ear complaints
- Hearing Loss
- Ear pain without observed problems
- Subtle TM changes
- Middle ear effusion; Serous Otitis
- Resolved Otitis Media
- Ear Tubes
- Screening

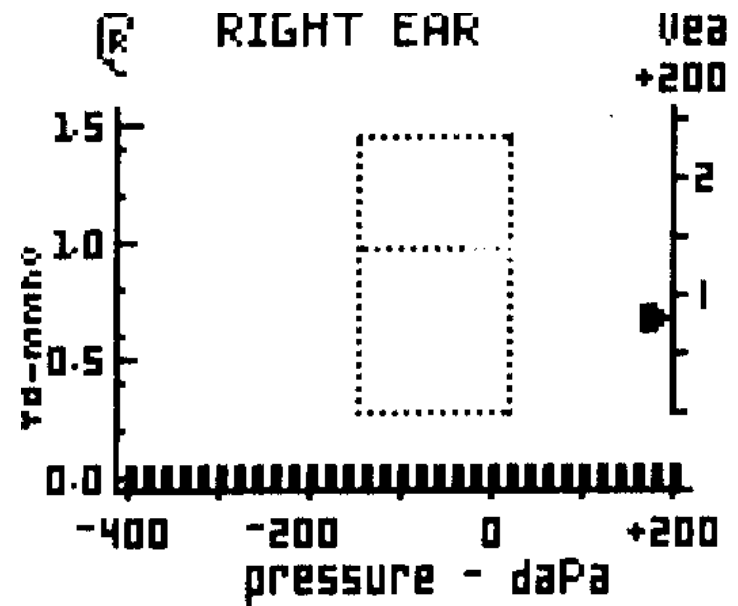
Normal Ear



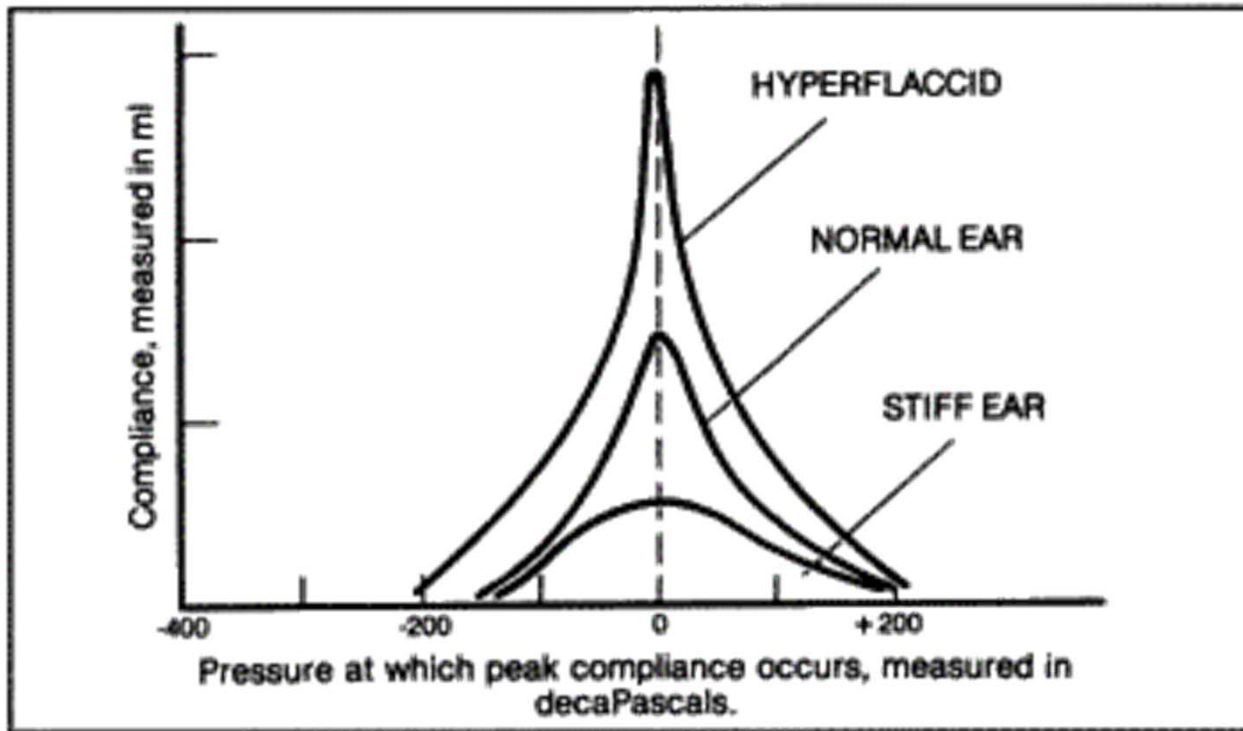
Otitis Media



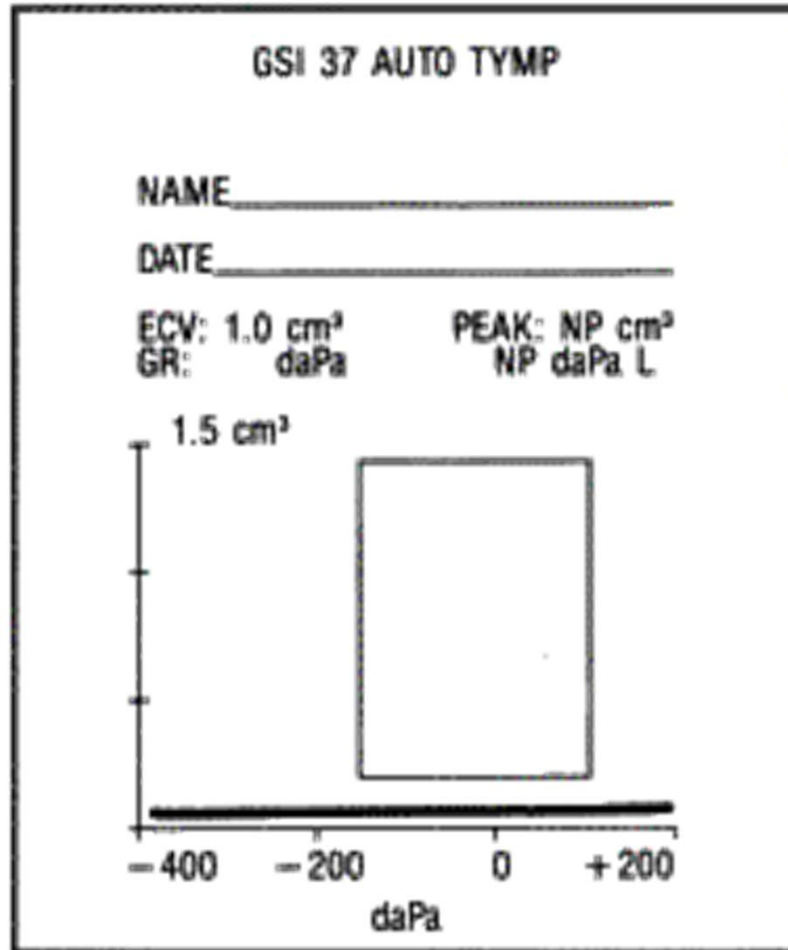
Tympanostomy Tube - Functional



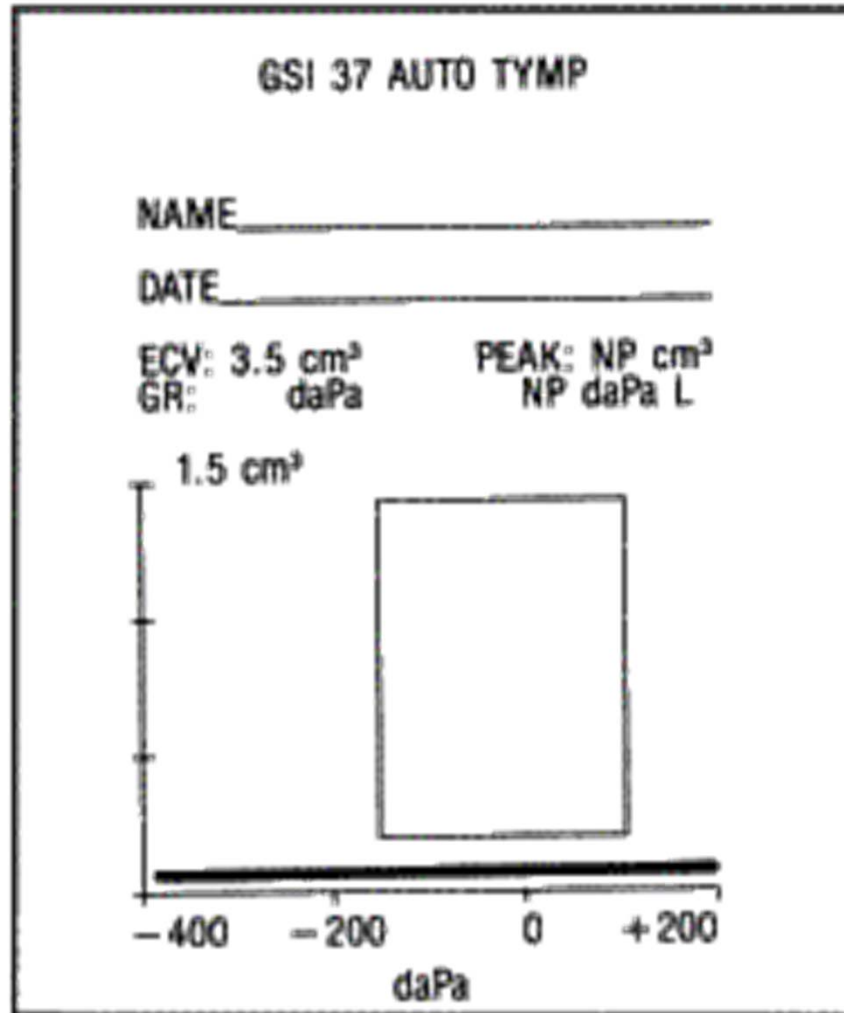
Compliance of the TM & Ossicles



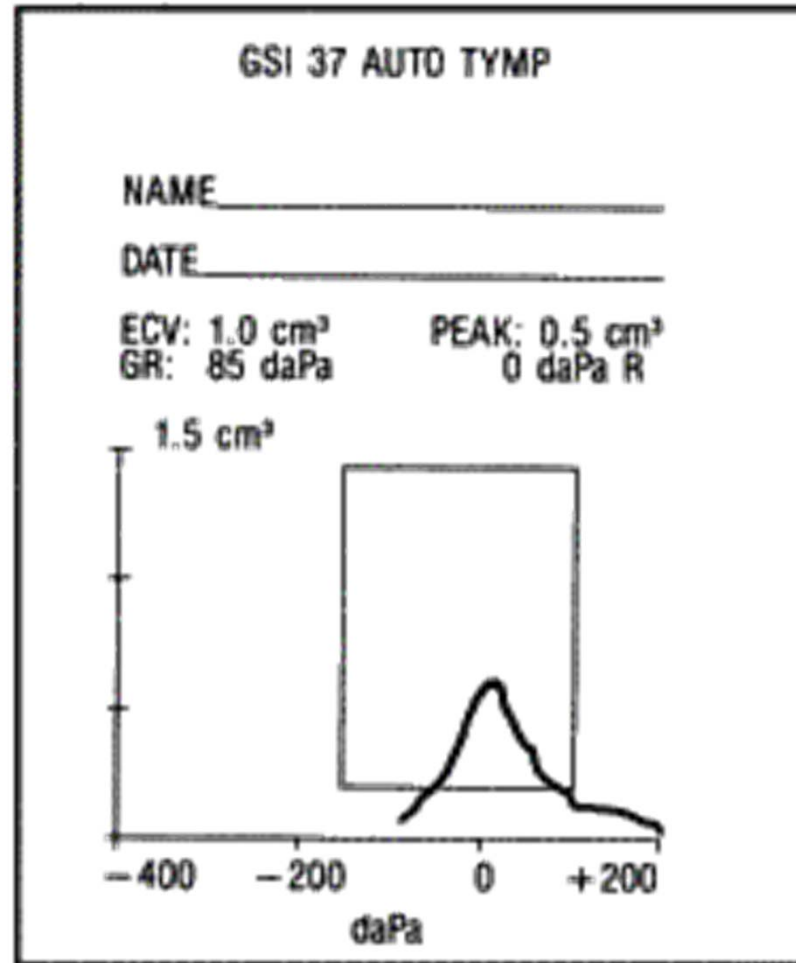
Flat TM: Serous Otitis



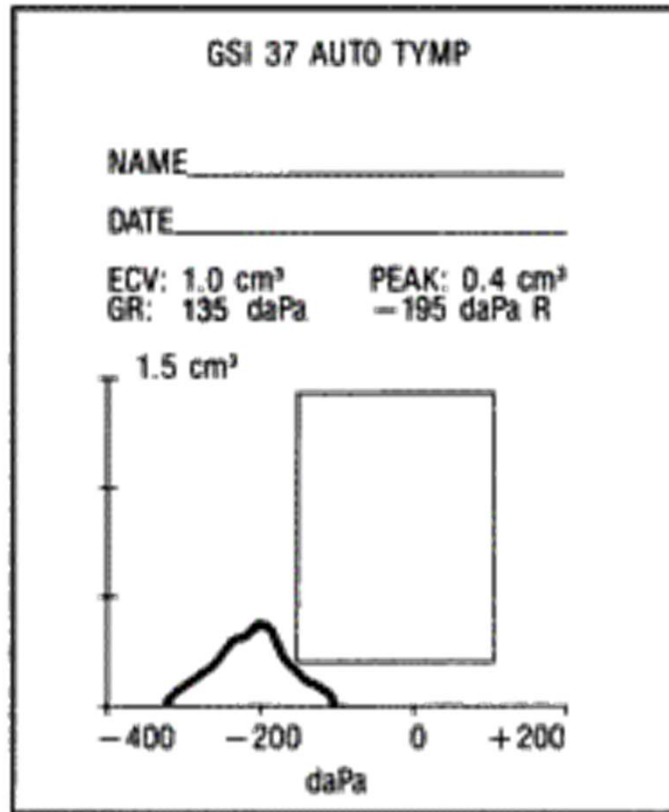
Flat TM: Patent Tube



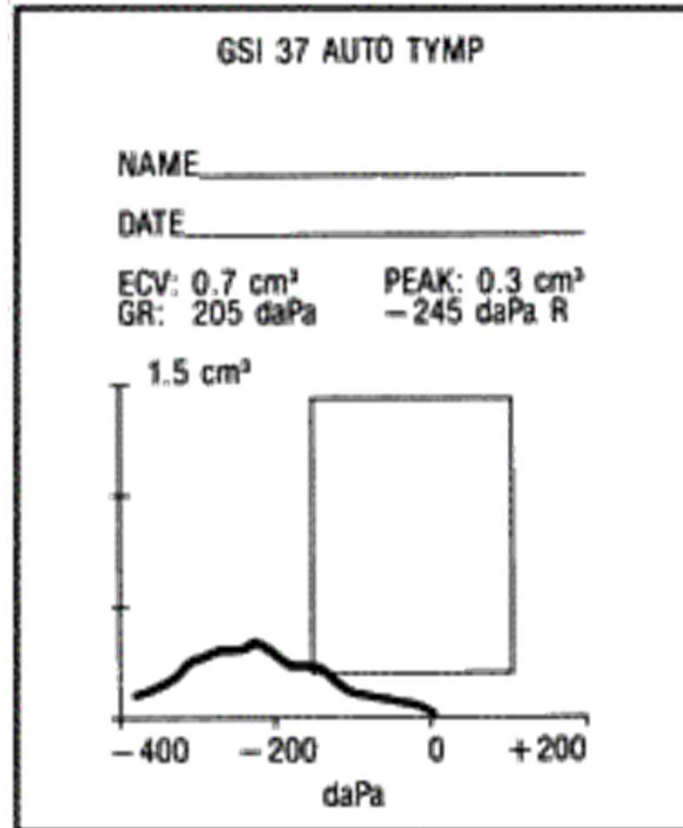
Normal



Abnormal: Negative Pressure



Abnormal: Negative Pressure Wide
GR, maybe air pockets in mid ear



Abnormal: Hyperflaccid TM

