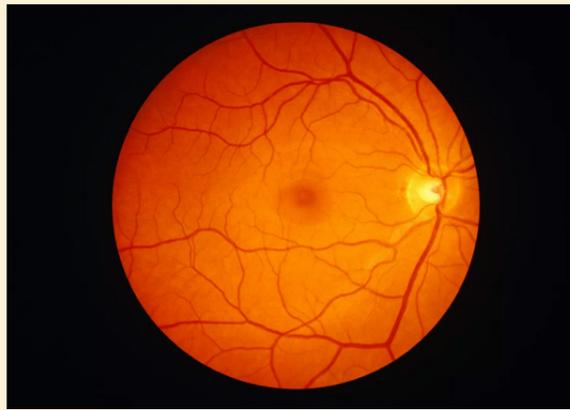
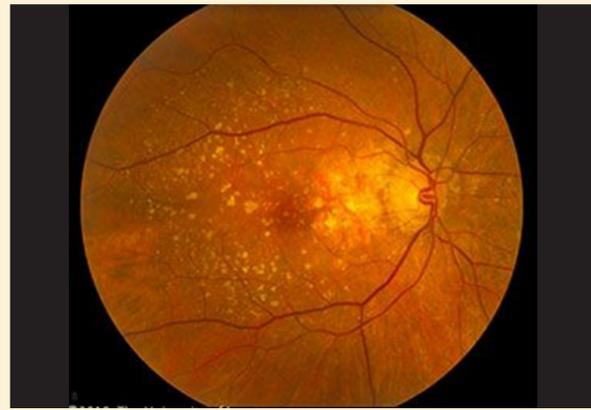


## Digital imaging techniques

Healthy eye



Age related macular degeneration



## Otoscopy

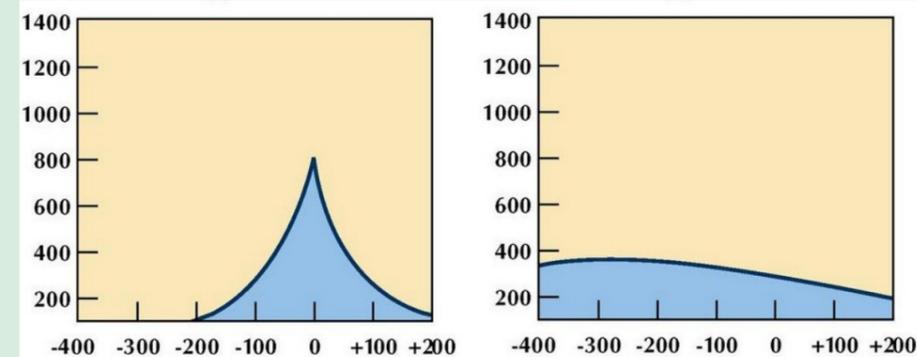
An otoscope is a tool which shines a beam of bright light into the ear canal to help visualize and examine the condition of the external auditory canal and eardrum. Abnormalities such as inflammation, discharge, presence of wax or other foreign bodies can be detected. An otoscope may allow the doctor to release a small puff of air into the auditory canal which allows an observation of how much the ear drum moves with pressure.

### Limitation

The procedure is visual, and no quantitative measurements can be made.

## Tympanometry

Used alongside otoscopic examination to help diagnose disorders that lead to hearing loss. The test measures movement of the tympanic membrane in response to changes in pressure. Results are recorded on a graph called a tympanogram. It will show if the eardrum moves the correct way, is too stiff, moves too much, or has a hole in it.



The graph on the left shows a normal tympanogram; the one on the right indicates fluid in the inner ear.

An **ophthalmic test**, tests both vision and the health of the eye. It includes tonometry (eye-pressure tests) and visual field tests. Newer techniques involve ophthalmic imaging.

### Ophthalmic imaging

- Digital techniques** are used to improve the measurement of eye defects, such as macular diseases and glaucoma. The technique is non-invasive, unlike angiographic techniques, and allows evaluation of both the retina and choroid layers of the eye.
- Angiographic techniques** can be used to measure blood flow through the eye. A dye is injected into the arm and its progress through the blood vessels of the eye is recorded using a retinal camera.

### Abnormal test results

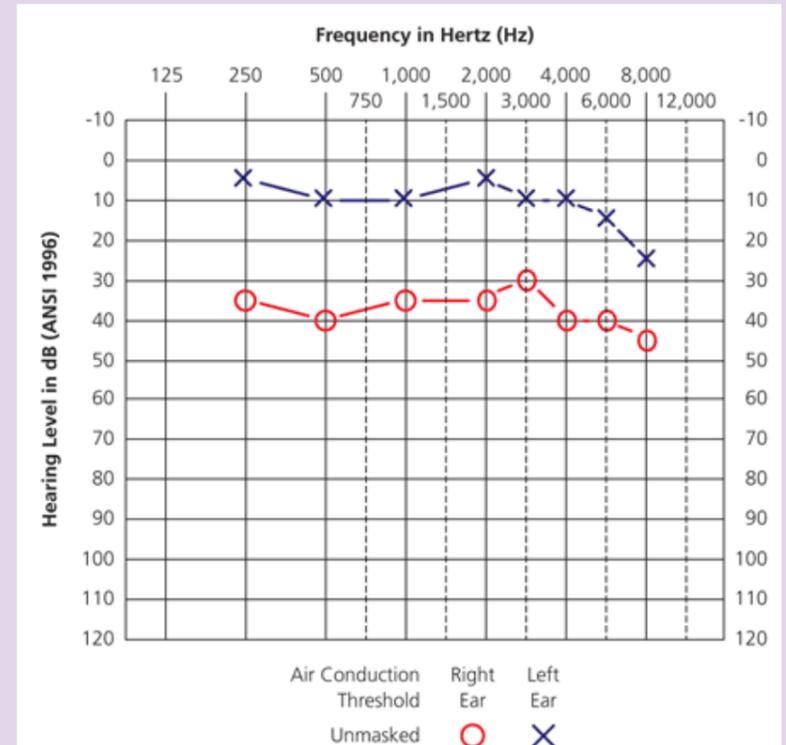
Vision impairment needing corrective lenses, astigmatism, macular degeneration, cataracts, corneal abrasion, glaucoma, damaged nerves or blood vessels.

## Tuning fork test

This hearing test is performed with a tuning fork. It can detect middle ear hearing loss and inner ear hearing loss. It is based on the knowledge that sounds travel better through solid bone, than the air.

## Pure tone audiometry

A pure tone audiometry test is performed as a part of routine screening, or to determine if there is some type of hearing loss. This test helps find the quietest sound which can be heard at different pitches or frequencies. The test can identify conditions such as a tumour on the auditory nerve, occupational hearing loss, trauma from a loud sound or blast, age related hearing loss, chronic ear infections, and ruptured eardrums.



This graph shows hearing loss in the right ear across all frequencies.

### Limitation

The test is not suitable for very young children as they cannot respond correctly to a sound played through a headphone.