## 1) Identify the test?

- Cottonwool test

## 2) Mention the sensation tested in this photo? And its tracts?

- Crude touch
- Ventral spinothalamic tract

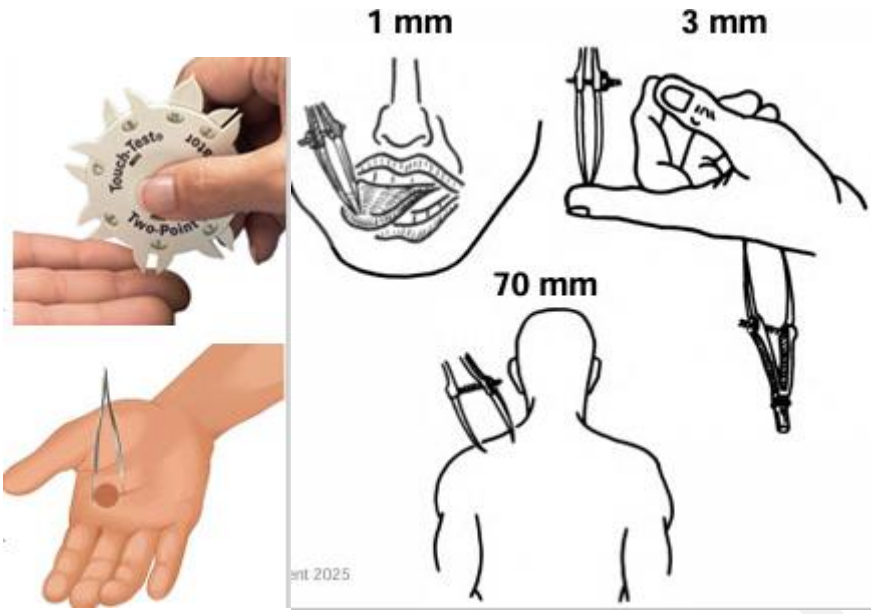
## 3) mention the pathway of this sensation?

- Ventral spinothalamic tract

## 4) Mention the afferents of this sensation?

a. Less differentiated free nerve endings

b. Hair end organs




## 1) Identify the test?

- two-point discrimination

## 2) Mention the sensation tested in this photo? And its tracts?

- Fine Touch
- dorsal column medial lemnisci system (DCML) or gracile and cuneate tracts

## 3) mention the pathway of this sensation?

- dorsal column medial lemnisci system (DCML) or gracile and cuneate tracts

## 4) Identify minimal distance?

- The shortest distance between 2 points to be felt as 2 separate points.

## 5) Mention the factors decreasing the minimal distance?

1. Number of receptors
2. Number of afferents
3. size of represented cortical area
4. convergence of afferents


## 1. Identify the test?

- Stereognosis

## 2. Mention the sensation tested in this photo? And its tracts?

- Fine Touch
- dorsal column medial leminiscal system (DCML) or gracile and cuneate tracts

## 3. Mention the receptors?

a. Meissner's corpuscles (rapidly adapting)

b. Merkel's discs (slowly adapting)


## 1) Identify the tools used in this test?

- Monofilament OR weights

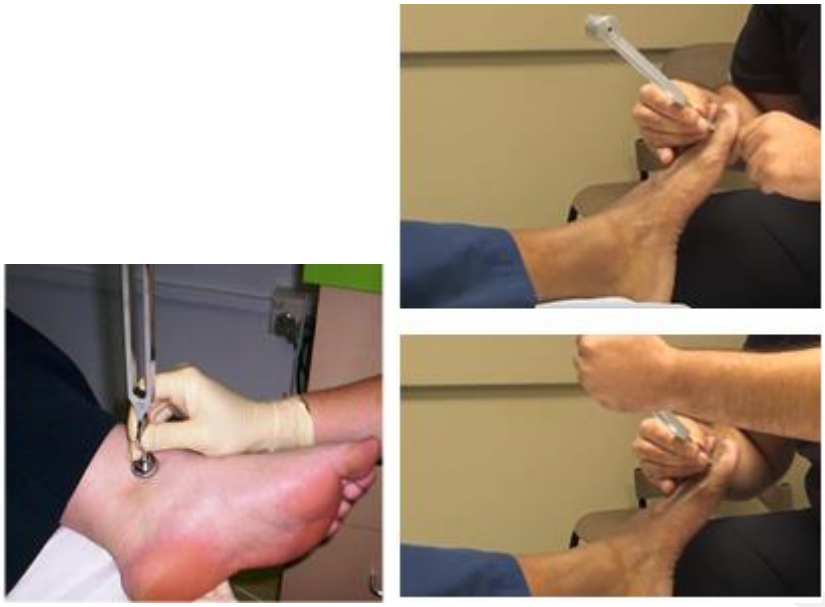
## 2) Mention the sensation tested in this photo? And its tracts?

- Pressure Sensation
- Dorsal Column Medial Lemniscus Pathway

## 3) Mention the receptors?

a. Rapidly adapting receptors (Pacinian corpuscles).

b. Slowly adapting receptors (Ruffini's nerve endings).



1) Identify the tools used in this test? tuning fork (128 Hz)

2) Mention the sensation tested in this photo? And its tracts?

- Vibration Sensation
- Dorsal Column Medial Lemniscus Pathway (Gracile and Cuneate tracts)

3) Mention the receptors?

a. Meissner's corpuscles: up to 200 cycles/second.

b. Pacinian corpuscles: up to 700 cycles/second.

## 1) Mention the sensation tested in this photo? And its tracts?

- Proprioceptive Sensation
- Dorsal Column Medial Lemniscus Pathway (Gracile and Cuneate tracts)

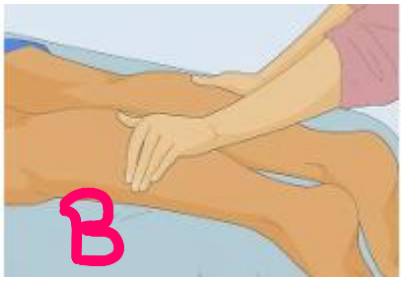
## 2) Mention the receptors?

| Muscle proprioceptors | Joint proprioceptors |
|---|---|
| Muscle spindles | **Rapidly adapting Receptors**<br>"Pacinian corpuscles" |
| Golgi tendon organs | **Slowly adapting Receptors**<br>Ruffini corpuscles<br>Golgi tendon organs |

## 3) Enumerate two types of this sensation?

1- Sense of Position: conscious orientation of the relative position of the different parts of the body to each other. "It is a static sense".

2- Sense of Movement: Conscious orientation of the changes in the relative position of the different parts of the body to each other - "It is a dynamic sense".


## 1) Mention the sensation tested in each photo? And its tracts?

A. Cutaneous pain: Pin prick test

B. Deep pain: Squeeze or pinch the muscles

- Lateral spinothalamic tract

## 2) mention the pathway of this sensation?

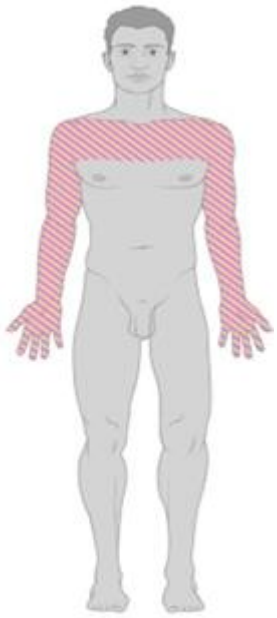
- Lateral spinothalamic tract

## 1) Mention the sensation tested in this photo? And its tracts?

- Thermal Sensation
- Lateral spinothalamic tract.

## 2) Compare between two types of the receptors of this sensation?

| Warmth receptors | Cold receptors |
|---|---|
| Free nerve endings. | Encapsulated nerve endings |
| Transmit mainly via C fibers. | Transmit mainly via A delta |
| Deeper | More Superficial |
| Fewer | 3-10 times number of warm receptors. |
| their range of stimulation is 25 - 45 °C | their range of stimulation is 10-35 °C |
| • Inactive at 25°C<br>• Rate of discharge ↑ with ↑ temperature<br>• Reach maximum at 37- 40 °C.<br>• ↓ discharge above 40°C<br>• Stop discharging at 45°C. | • Inactive at 35°C<br>• Discharge ↑ with ↓ temperature<br>• Reach maximum discharge at 24°C.<br>• ↓ discharge below 24°C.<br>• Stop discharging at 10°C. |

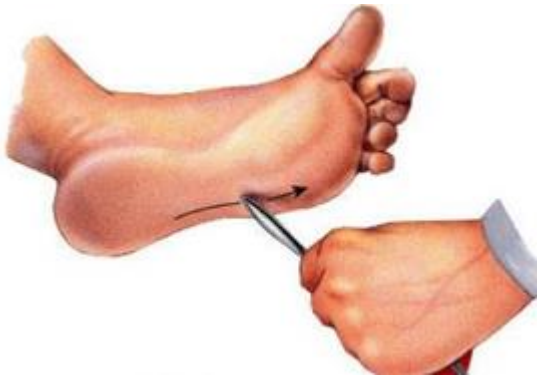


1) mention this type of sensory loss? (jacket sensory loss)

2) What is the disease? Syringomyelia

## Identify this reflex? And its center?

- Plantar Reflex
- Center: S1 and S2



## 1) Identify this sign?

- Babinski sign

## 2) Enumerate causes of it?

| a) Physiological causes: | b) Pathological causes: |
|---|---|
| **Newly born infants:** during the 1st few months of their life due to incomplete myelination of pyramidal tract. | **UMNL.** |
| Normal adults: during **deep sleep** or during general **anesthesia**. | When the cerebral cortical function is depressed as in **coma** |

## 1) Identify this reflex? And its center?

- Knee jerk
- L-2-3-4

## 2) Mention the name of the muscle and its tendon?

- Quadriceps femoris
- patellar tendon

## 3) How to reinforce it?

A. Jendrassik's maneuver → ask the patient to hook his fingers or to clench his teeth → send signals from the contracted ms which stimulating γ-MNs.

B. distracting patients' attention prevents any voluntary inhibition of the reflex

## 4) Enumerate cause of hyperreflexia?

## 5) Enumerate causes of hyporeflexia?

| | Hyperactive(exaggerated) TJ | Hypoactive (decreased) TJ |
|---|---|---|
| **Physiological causes** | Anxiety and nervousness | Sleep and anesthesia |
| **Pathological causes** | -UMNL<br>-Lesion in area 6<br>-tetany and hyperthyroidism<br>-lesion of paleocerebellum | -LMNL<br>-Lesion in area 4<br>-hypothyroidism<br>-neocerebellar syndrome |

## 1) Identify this reflex? And its center?

- Ankle jerk
- S1-2

## 2) Mention the name of the muscle and its tendon?

- Gastroceniumus and soleus
- tendoachilles

## 3) How to reinforce it?

a. Jendrassik's maneuver → ask the patient to hook his fingers or to clench his teeth → send signals from the contracted ms which stimulating γ-MNs.

b. Distracting patient's attention→ prevents any voluntary inhibition of the reflex

## 4) Enumerate cause of hyperreflexia?

## 5) Enumerate causes of hyporeflexia?

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## 1) Identify this reflex? And its center?

- Biceps jerk
- C5-6

## 2) Mention the name of the muscle and its tendon?

- Biceps muscle.
- biceps tendon

## 3) How to reinforce it?

A. Jendrassik's maneuver → ask the patient to hook his fingers or to clench his teeth → send signals from the contracted ms which stimulating γ-MNs.

B. Distracting patient's attention→ prevents any voluntary inhibition of the reflex

## 4) Enumerate cause of hyperreflexia?

## 5) Enumerate causes of hyporeflexia?

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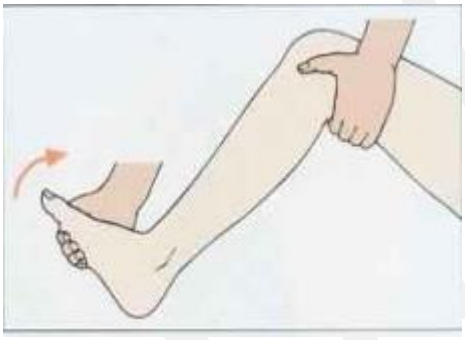
## identify this reflex? And its center?

- Triceps jerk
- C 6-7

## Mention the name of the muscle and its tendon?

- Triceps Muscle
- triceps tendon



## Identify this sign and its mechanism?

- Ankle clonus
- Mechanism of clonus:

  Clonus is the result of a stretch reflex inverse stretch reflex sequence

## 1) identify this reflex? And its center?

- Corneal Reflex
- Main facial nucleus in the pons.

## 2) Mention the pathway of this reflex

| | |
|---|---|
| **Receptors** | Touch receptors. |
| **Afferent** | Ophthalmic division of trigeminal nerve<br>which relay in sensory nucleus of trigeminal nerve. |
| **Center** | Main facial nucleus<br>in the pons. |
| **Efferent** | Facial nerve. |
| **Effector** | Orbicularis oculi muscle. |
| **Response** | Closure of the eyelids. |

## 3) Mention its significance?

Physiological:

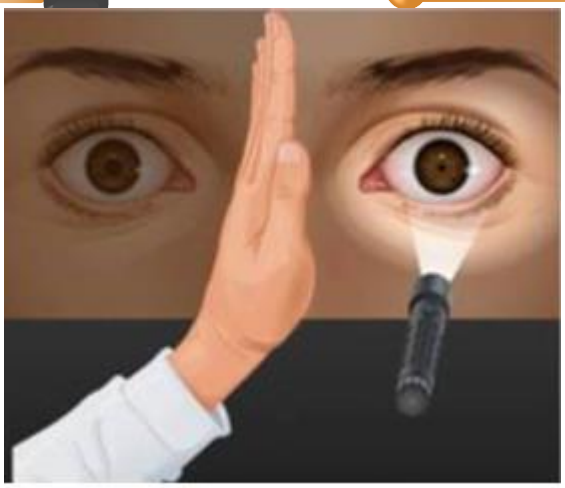
1) It is protective that protect cornea from foreign bodies.

2) Loss of corneal reflex leads to ulceration.corneal

Medical or clinical:

1) It is used to detect the pathway integrity.

2) Test for functions of trigeminal and facial nerves



## 1) identify this reflex? And its center?

- Pupillary Light Reflex
- Pretectal nucleus of the same side

## 2) Mention the pathway of this reflex

| | |
|---|---|
| **Stimulus:** | Light |
| **Receptors:** | Visual receptors |
| **Afferent:** | Optic pathway before it reaches LGB. |
| **Center:** | **Pretectal nucleus of the same side** |
| **Efferent:** | **Tectonuclear tract** to Edinger Westphal nuclei of the oculomotor nerve on both sides. |
| **Effector organ:** | Sphincter pupillae muscles of both eyes |
| **Response:** | Constriction (**miosis**) of pupils of both sides. |

## 3) Mention its significance?

- Physiological:

  It is protective reflex which prevents over exposure of the retina to harmful excessive illumination.

- Medical or clinical:

  Diagnosis and localization of lesions in the pathway of the reflex

## 4) How to explain consensual light reflex?

1) Partial decussation at the optic chiasma.

2) Bilateral innervation of the Edinger Westphal nuclei from each pretectal nucleus

## 1. identify this reflex? And its center?

- Accommodation Reflex (near reflex)
- visual cortex to 3rd cranial nerve nucleus.

## 2. Mention the pathway of this reflex

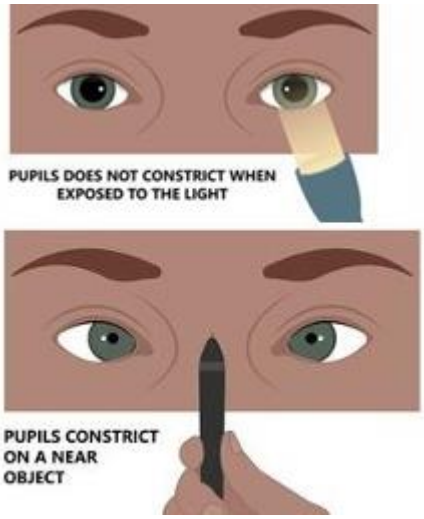
| | |
|---|---|
| **Stimulus:** | Blurring of image |
| **Receptors:** | Visual receptors |
| **Afferent:** | Visual pathway. |
| **Center:** | From visual cortex to 3rd cranial nerve nucleus. |
| **Efferent & Effector organ & Response:** | ▪ **Somatic part** of 3rd CN nucleus to medial rectus ms. mediates convergence. |
| | ▪ **Autonomic part: (EW nucleus)** to ciliary ms. mediates its contraction and so increases Lens convexity. |
| | ▪ **Autonomic part: (EW nucleus)** to constrictor pupillae ms for miosis. |

## 3. Mention changes occur in this reflex?

a) Miosis of both eyes.

b) Increase lens convexity of both eyes.

c) Medial convergence of both eyes

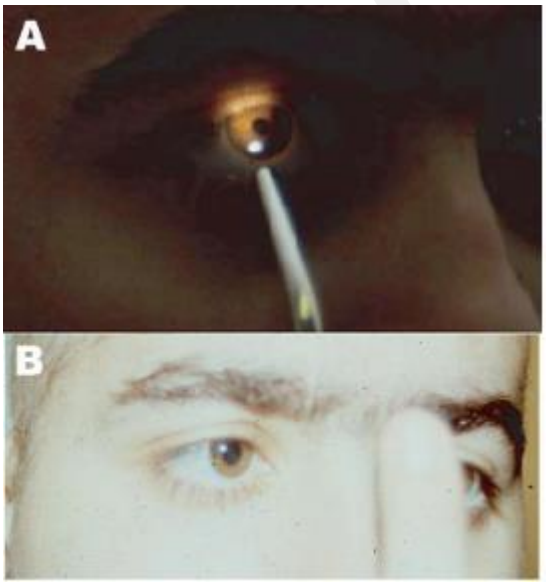



## 1) Identify the lesion?

Argyll-Robertson Pupil

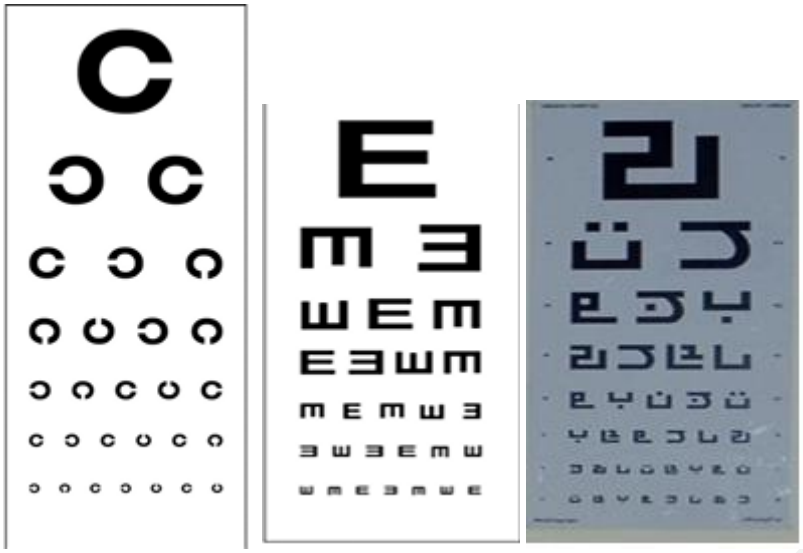
## 2) Mention causes of it?

Lesion in the pretectal nucleus of the midbrain as in syphilis/or syringomyelia of the aqueduct of Sylvius which destroy the crossing fibers




**Identify the lesion?** Reverse argyll-robertson pupil

**Mention causes of it?** lesion in the occipitotectal tracts.



## 1) identify each photo?

- Landolt's C charts / Snellen's letter charts /Emarah arabic chart

## 2) Mention their use?

- Measurement of Visual Acuity

## 3) Enumerate factors affecting visual acuity?

- Degree of illumination of the chart; bad illumination impair visual acuity
- Fovea centralis: it is the most sensitive point in the retina having the maximal visual acuity.
- Age: visual acuity decreases in old age.
- Spherical and chromatic aberrations caused by dilated pupil impair visual acuity.
- Errors of refractions e.g. myopia, hypermetropia and astigmatism decrease visual acuity

1. Identify this test?

- confrontation test

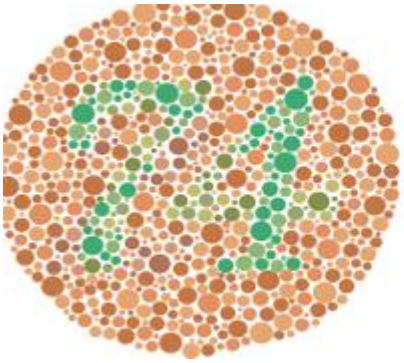
2. Mention its use?

- Determination of visual field

1) Identify this instrument? And its importance?

**Perimeter**

It maps the visual field & detects any defect in the visual field.



## 1) Identify this test?

- Ishihra chart

## 2) Which disease is diagnosed by it?

- colour blindness

## 3) Enumerate types of this disease?

1) Anomalous trichromate:
2) Dichromats
3) Monochromats

## 1. Identify this test?

Wool classification & matching test

## 2. Which disease is diagnosed by it?

colour blindness

1) Identify this test? Edridge green lantern test

2) Which disease is diagnosed by it? color blindness

Identify this test? Whispered voice test

Which disease is diagnosed by it? Deafness

1) Identify this test? Weber test

2) How to interpret the results?

**Interpretation:**

a. Normal person → hears equally on both sides.

b. Conductive deafness → sound in diseased ear is louder than normal ear

c. Perceptive deafness → sound in normal ear is louder than diseased ear.

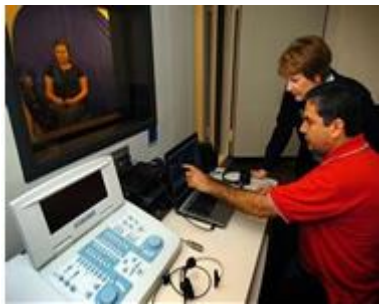
Identify this test? Rinne test

How to interpret the results?

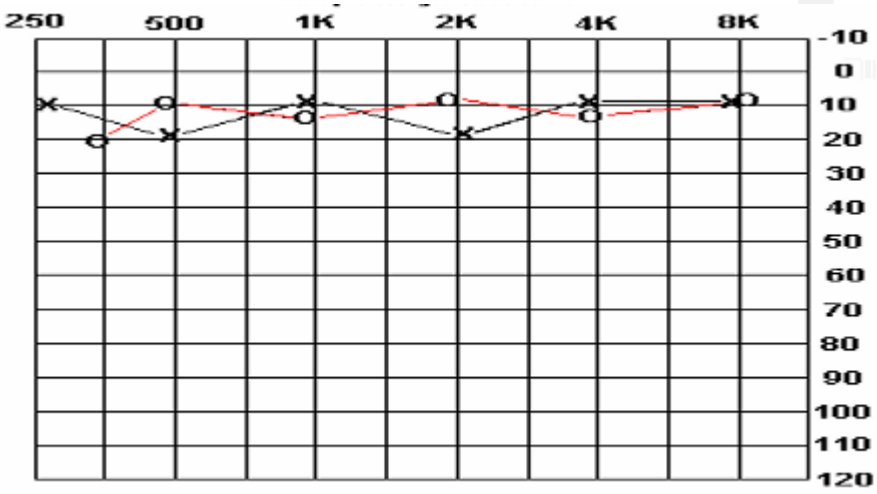
a. Normal hearing persons will note air conduction twice as long as bone conduction (AC >BC; Rinne positive)

b. With conductive hearing loss, bone conduction sound is heard longer than or equally as long as air conduction (BC >AC; Rinne's negative)

c. With sensorineural hearing loss, air conduction is heard longer than bone conduction in affected ear, but less than 2:1 ratio (reduced +ve Rinne)



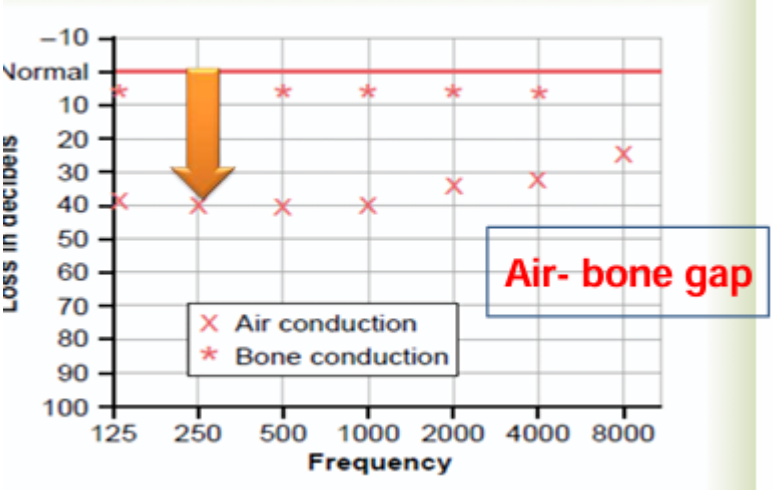
Identify this instrument? And its use ? pure tone audiometry for detection of deafness




Identify this photo? pure tone audiogram

What is the diagnosis? Normal person

Compare between conductive vs sensorineural deafness

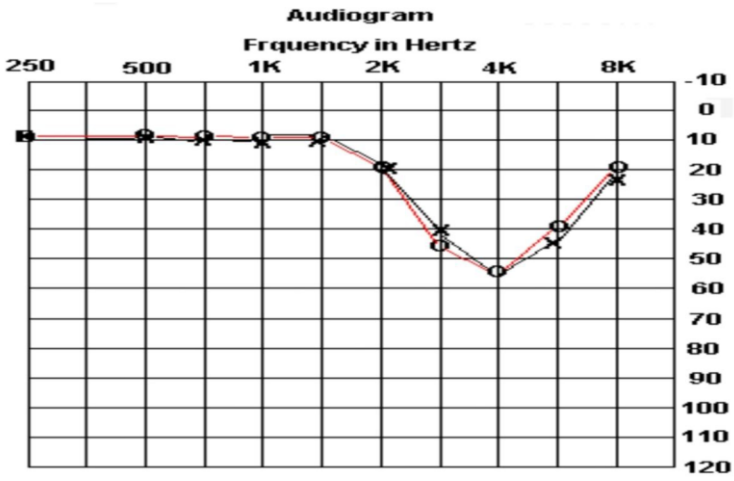



1) Identify this photo? pure tone audiogram

2) What is the diagnosis? Conductive deafness (air bone gap)

3) Compare between conductive vs sensorineural deafness

| | Conductive Deafness | Sensorineural Deafness |
|---|---|---|
| **Causes** | **a) Causes in the external ear:**<br>•Obstruction of the ext. meatus by accumulation of wax, foreign body, inflammation or tumour.<br>**b) Causes in the middle ear:**<br>• Tympanic membrane perforation<br>• Middle ear inflammation (acute and chronic otitis media).<br>• Bony ossicles otosclerosis<br>• Eustachian tube obstruction as in common cold. | **a) Damage of hair cells** due to:<br>✓Prolonged use of antibiotics e.g. streptomycin.<br>✓Prolonged exposure to high intensity sounds as in airports and noisy factories.<br>b) Meneier's disease<br>c) Damage of the cochlear nerve or auditory cortex due to severe head injuries or tumors. |
| **Character** | -Air conduction is more affected than bone conduction<br>-All frequencies are affected equally. | -Both air conduction and bone conduction are affected equally<br>-Some frequencies are affected more. |




1) Identify this photo? pure tone audiogram

2) What is the diagnosis? sensorineural deafness

3) Compare between conductive vs sensorineural deafness

| | Conductive Deafness | Sensorineural Deafness |
|---|---|---|
| **Causes** | **a) Causes in the external ear:**<br>•Obstruction of the ext. meatus by accumulation of wax, foreign body, inflammation or tumour.<br>**b) Causes in the middle ear:**<br>• Tympanic membrane perforation<br>• Middle ear inflammation (acute and chronic otitis media).<br>• Bony ossicles otosclerosis<br>• Eustachian tube obstruction as in common cold. | **a) Damage of hair cells** due to:<br>✓Prolonged use of antibiotics e.g. streptomycin.<br>✓Prolonged exposure to high intensity sounds as in airports and noisy factories.<br>b) Meneier's disease<br>c) Damage of the cochlear nerve or auditory cortex due to severe head injuries or tumors. |
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