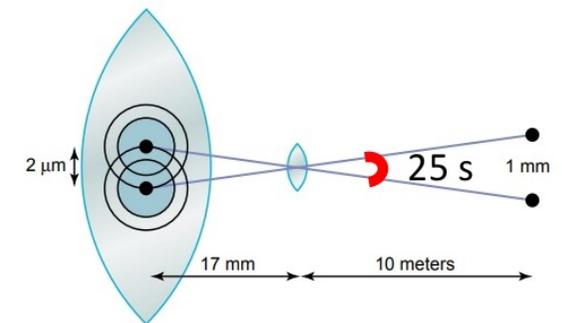


Physiology Lab 1

Visual Acuity

- The ability of eye to detect finest details of an object
- person can distinguish two separate points if their centers are 2 micrometers apart on the retina/ at least 1 receptor in between unstimulated
- light rays from two separate points strike the eye with an angle of at least 25 seconds between them, they can usually be recognized as two points



Maximum visual acuity for two point sources of light.

Visual Acuity

- Assesed by Snellen chart

1. Patient is kept at 6 metre distance –parallel rays & accommodation is eliminated

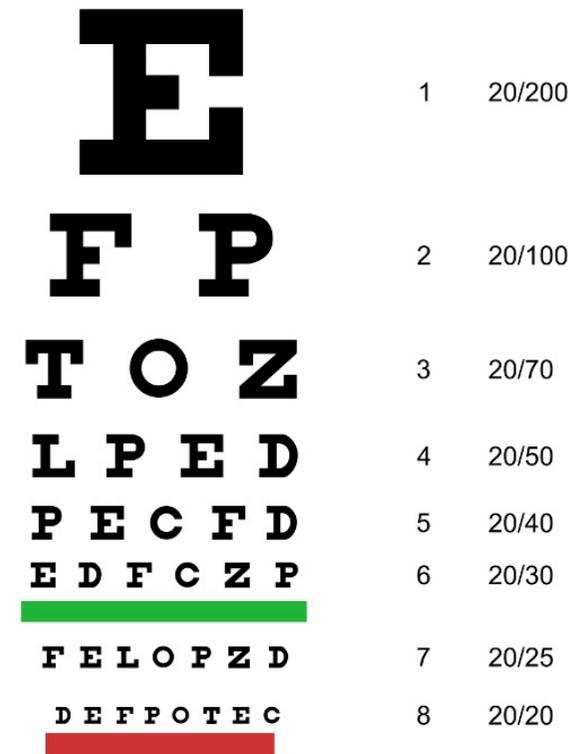
2. Each eye has to be tested separately /put glasses

3. Illumination should be adequate

4. Patient is asked to read from the top letter Vision

Numerator indicates distance at which person can see

Denominator indicates distance at which person with normal vision able to read that letter



E	1	20/200
F P	2	20/100
T O Z	3	20/70
L P E D	4	20/50
P E C F D	5	20/40
E D F C Z P	6	20/30
F E L O P Z D	7	20/25
D E F P O T E C	8	20/20

Visual Acuity

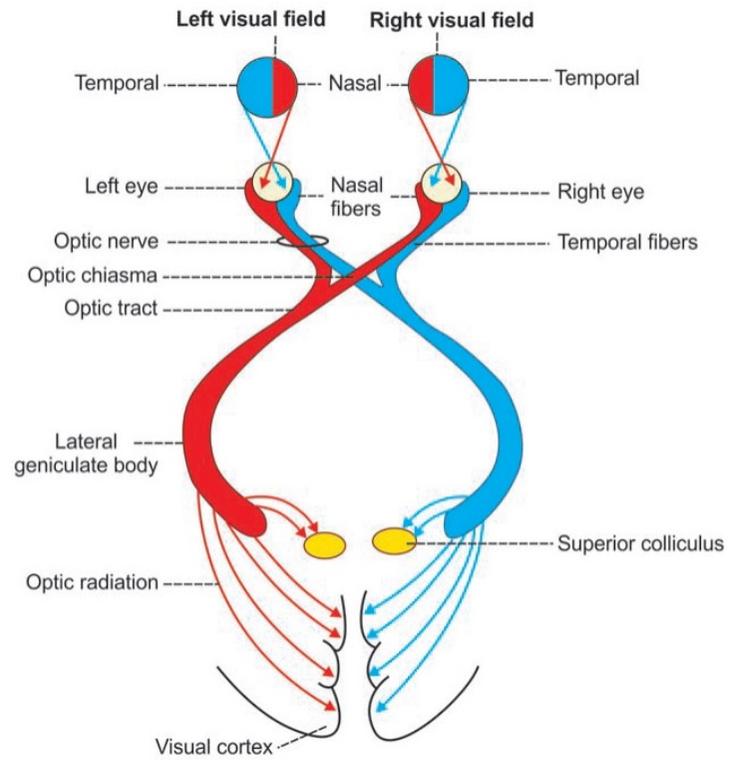
- 20/20
 - ability to see letters of a given size at 20 feet
- 20/40
 - what a normal person can see at 40 feet, this person must be at 20 feet to see.
- 20/200
 - what a normal person can see at 200 feet, this person must be at 20 feet to see.

E	1	20/200
F P	2	20/100
T O Z	3	20/70
L P E D	4	20/50
P E C F D	5	20/40
E D F C Z P	6	20/30
F E L O P Z D	7	20/25
D E F P O T E C	8	20/20

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Visual pathway

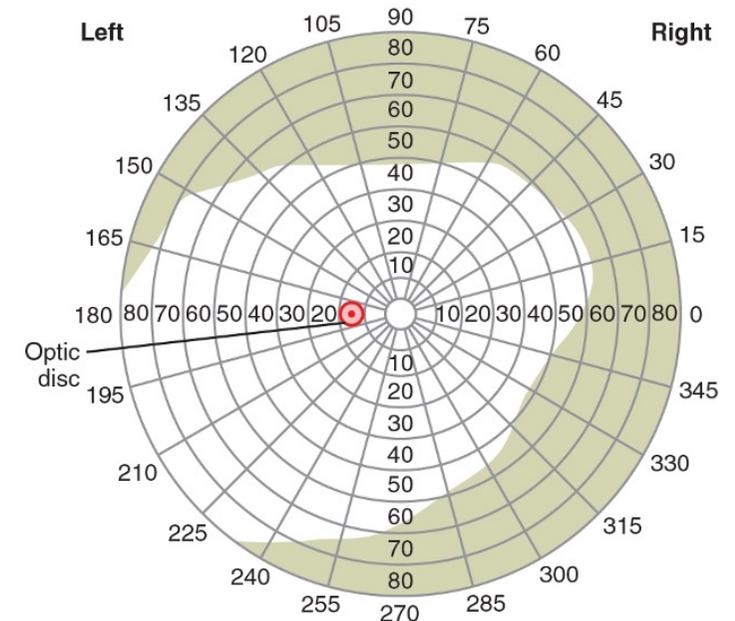


Fields of Vision; Perimetry

Nasal & temporal fields of vision.

Perimetry to diagnose **blindness in specific portions of the retina**

Charts of the the field of vision for each eye
the subject look with one eye toward a **central spot** directly
in front of the eye; the other eye is closed.
A small dot of light or a small object is then moved back and
forth in all areas of the field of vision, and the subject
indicates when the spot of light or object can and cannot be
seen.



Fields of Vision- Perimetry

blind spot caused by lack of rods and cones in the retina over the optic disc is found about 15 degrees lateral to the central point of vision

Occasionally, blind spots are found in portions of the field of vision **other than the optic disc area**=scotomata → damage to the optic nerve

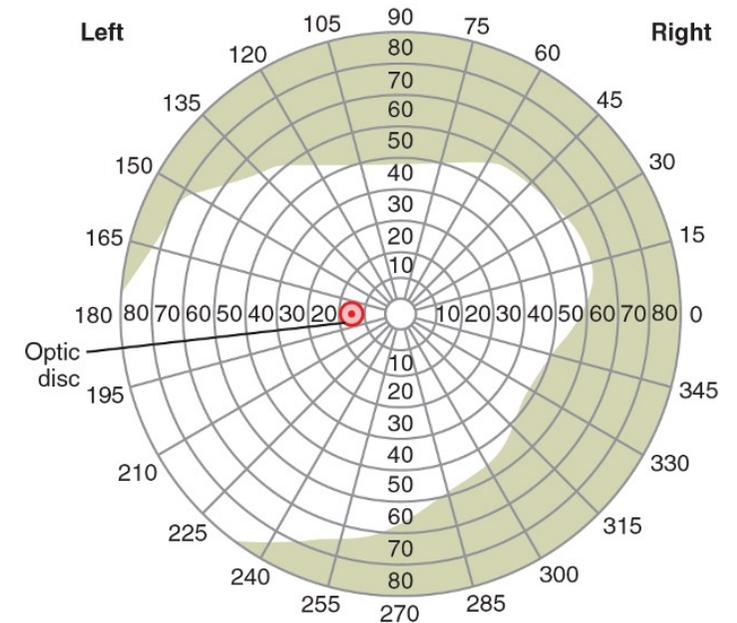
Causes

glaucoma

allergic reactions in the retina

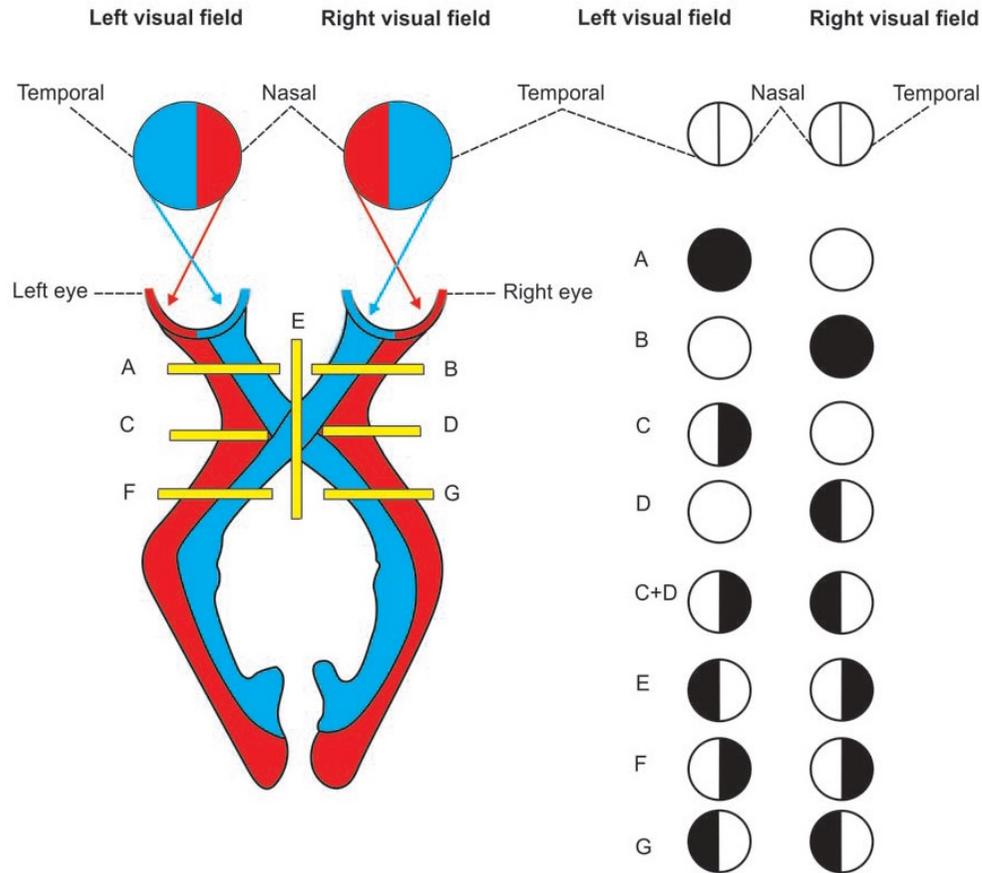
toxic conditions such as lead poisoning or excessive use of tobacco.

retinitis pigmentosa → peripheral field of vision first and then gradually encroaches on the central areas



Confrontation Visual Field Testing

lesions of optic pathway



- A. Lesion of left optic nerve: Total blindness of left eye
- B. Lesion of right optic nerve: Total blindness of right eye
- C. Lesion of lateral fibers in left side of optic chiasma: Left nasal hemianopia
- D. Lesion of lateral fibers in right side of optic chiasma: Right nasal hemianopia
- C + D. Lesion of lateral fibers in both sides of optic chiasma: Binasal hemianopia
- E. Lesion of medial fibers in optic chiasma: Bitemporal hemianopia
- F. Lesion of left optic radiation: Right homonymous hemianopia
- G. Lesion of right optic radiation: Left homonymous hemianopia.

Colour Blindness

- Color blindness/color vision deficiency→ inability/decreased ability to see color, or perceive color differences, under normal lighting conditions.
- results from absence of color-sensitive pigment in cone cells

main types of CVD:

- **Red-Green deficiency**

- unable to distinguish certain shades of red & green
- the most commonly inherited type.

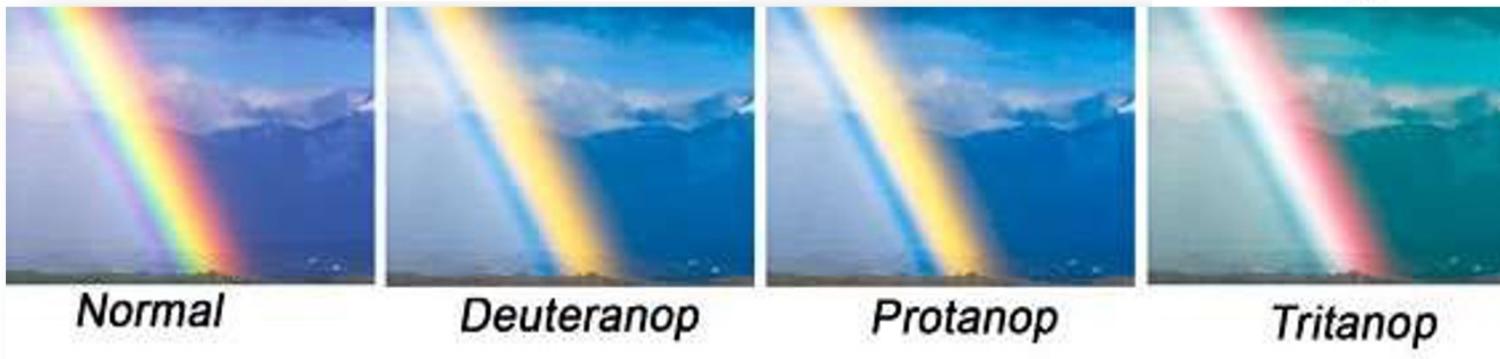
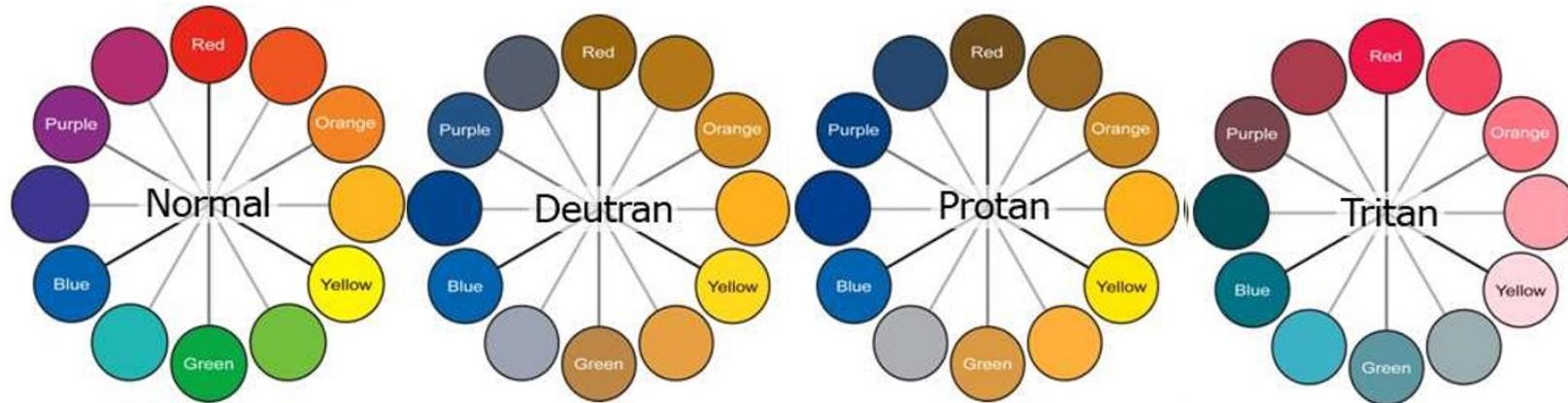
- **Blue-Yellow deficiency**

- difficult to distinguish between blue and green
- yellow may appear as a pale grey or purple.
- rare condition

Protanopes: do not see **RED**

Deutanopes: do not see **GREEN**

Tritanopes: do not see either **YELLOW** or **BLUE**



Ishihara's test

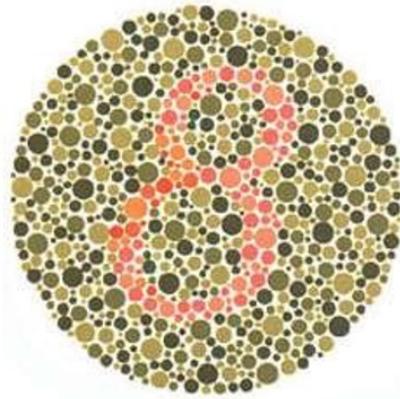
- The most common is the Ishihara Plate test.
- Can test for red/green colour blindness but **not** blue colour blindness.
- Contains 24 plates of circles created by irregular coloured dots in two or more colours.

Steps & Procedure

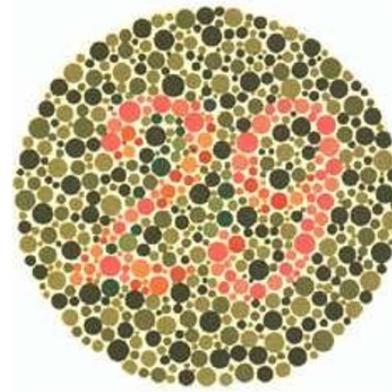
1. Obtain the chart

Note: before administering this test; you should be tested first.

2. Explain the procedure to the pt.
3. Ask pt first to read the plates with both eyes (with a corrective glasses if there is one)
4. Test pt's monocularly, one eye at a time.
5. Record those frames the pt misses.

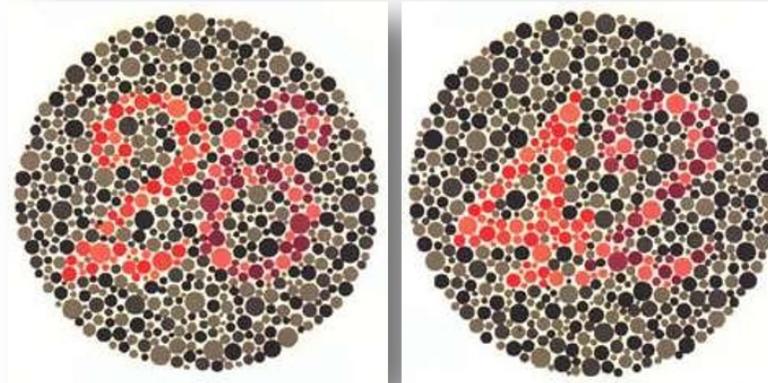


$2^{nd} = 8$



$3^{rd} = 29$

- Red-green deficiency would read it as:
 2^{nd} plates=3 , 3^{rd} plate= 70
- Those with total colour blindness cannot read any figures.



$16^{\text{th}}=26$

$17^{\text{th}}=42$

- protanopic would read it as:

$16^{\text{th}}=6,$

$17^{\text{th}}=2$

- Deutaneropic would read it as:

$16^{\text{th}}=2,$

$17^{\text{th}}=4$

Analysis The Results

- If 13 (out of 24) or more plates are read normally, the color vision is regarded as normal.
- If only 9 or less than 9 plates are read normally, the color vision is regarded as deficient.

The End