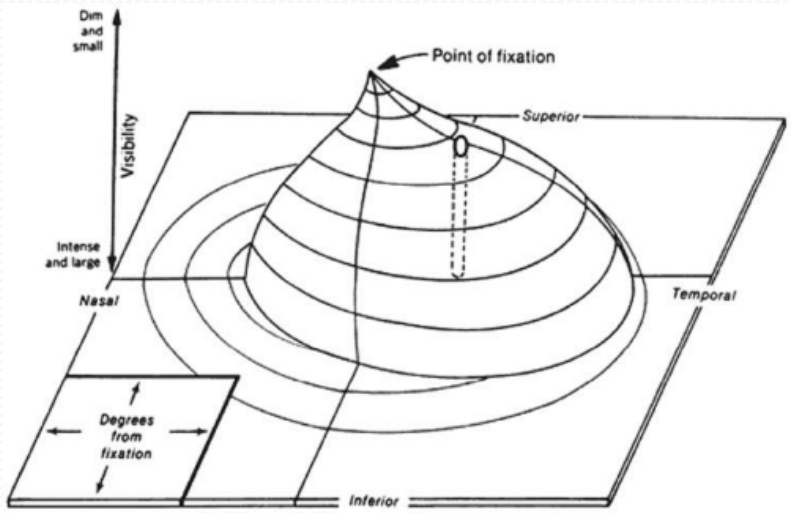
TO MAP THE PERIPHERAL FIELD OF VISION WITH PERIMETER

VISUAL FIELD:

- The part of environment that is visible to steadily fixing eye

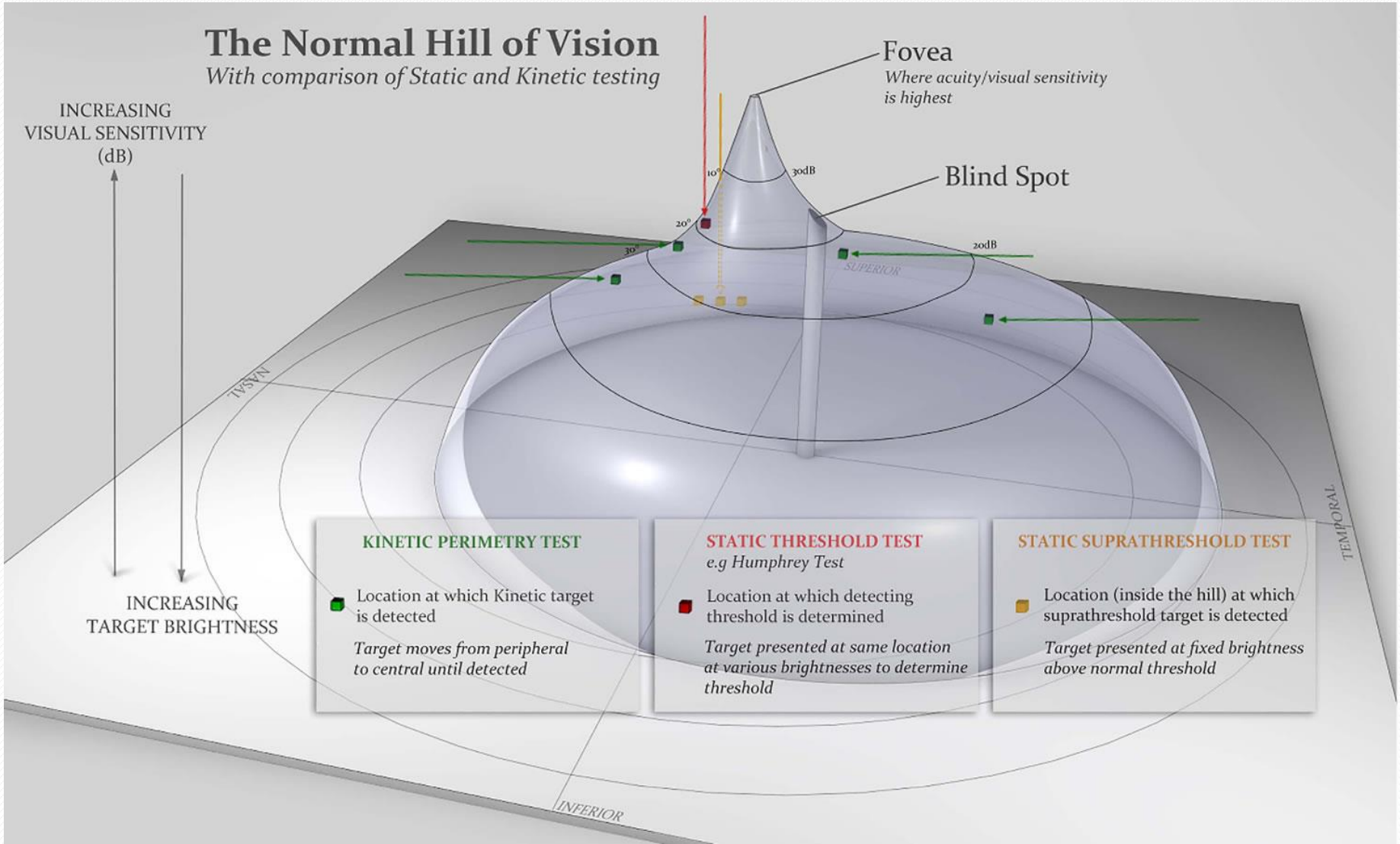
- **hill of vision in a sea of darkness** a classic description by Harry Moss Traquair (1875–1954)

- Hill of vision is a **3D representation of retinal light sensitivity**
- The **shape of hill of vision** is closely related to **packing density of cones**
- **Sea** represents the areas of no light perception



The hill is **highest at fixation**, where **visual sensitivity** is greatest

The **height** of the hill of vision **declines toward the periphery** as **visual sensitivity diminishes**

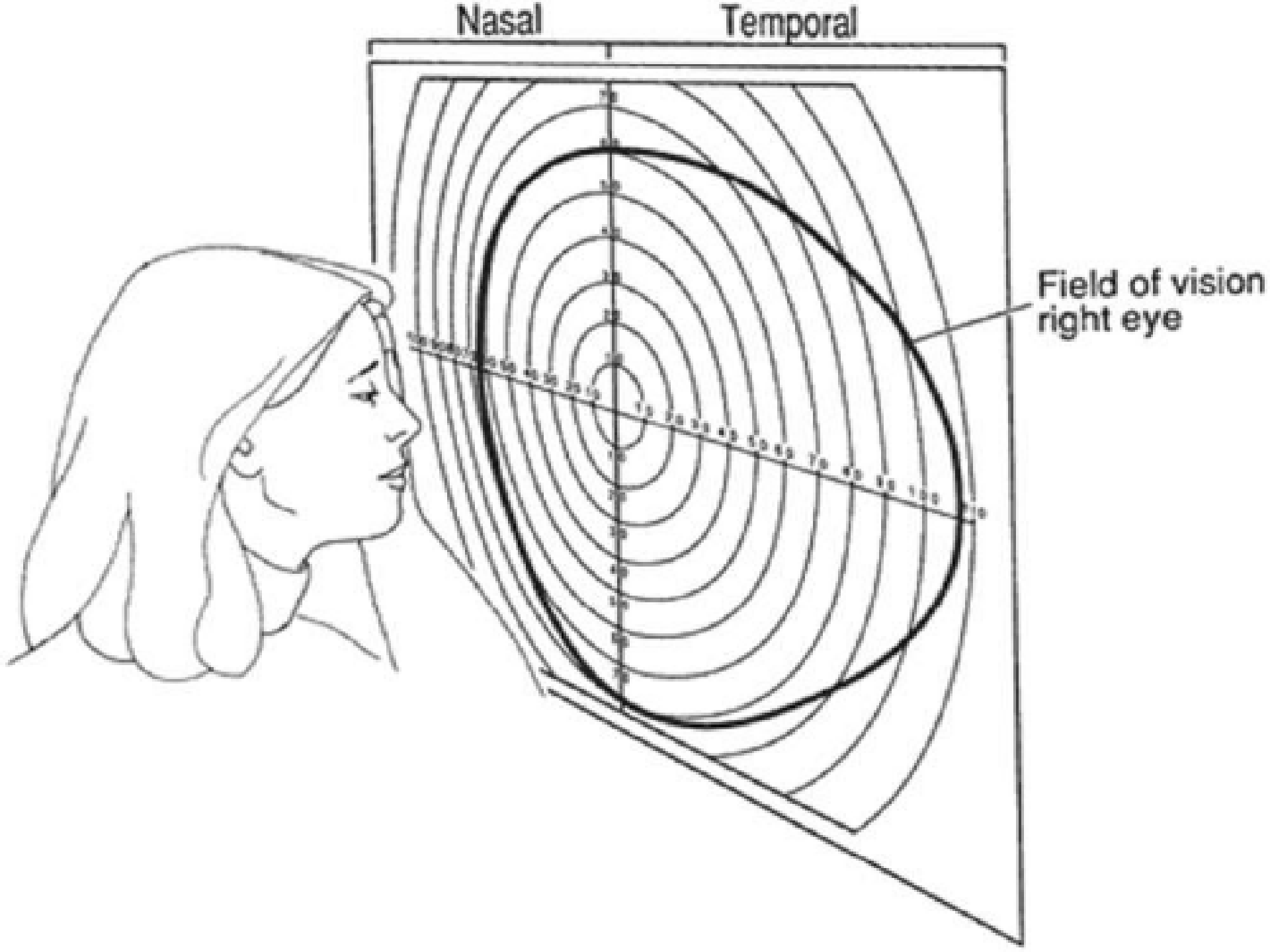


PERIMETRY:

- Perimetry refers to the **clinical assessment of the visual field**
- Perimetry means measurement of boundaries and in this case the **boundaries of visible area**
- It is the method of recording field of vision by perimeter

EXTENT OF FIELD OF VISION:

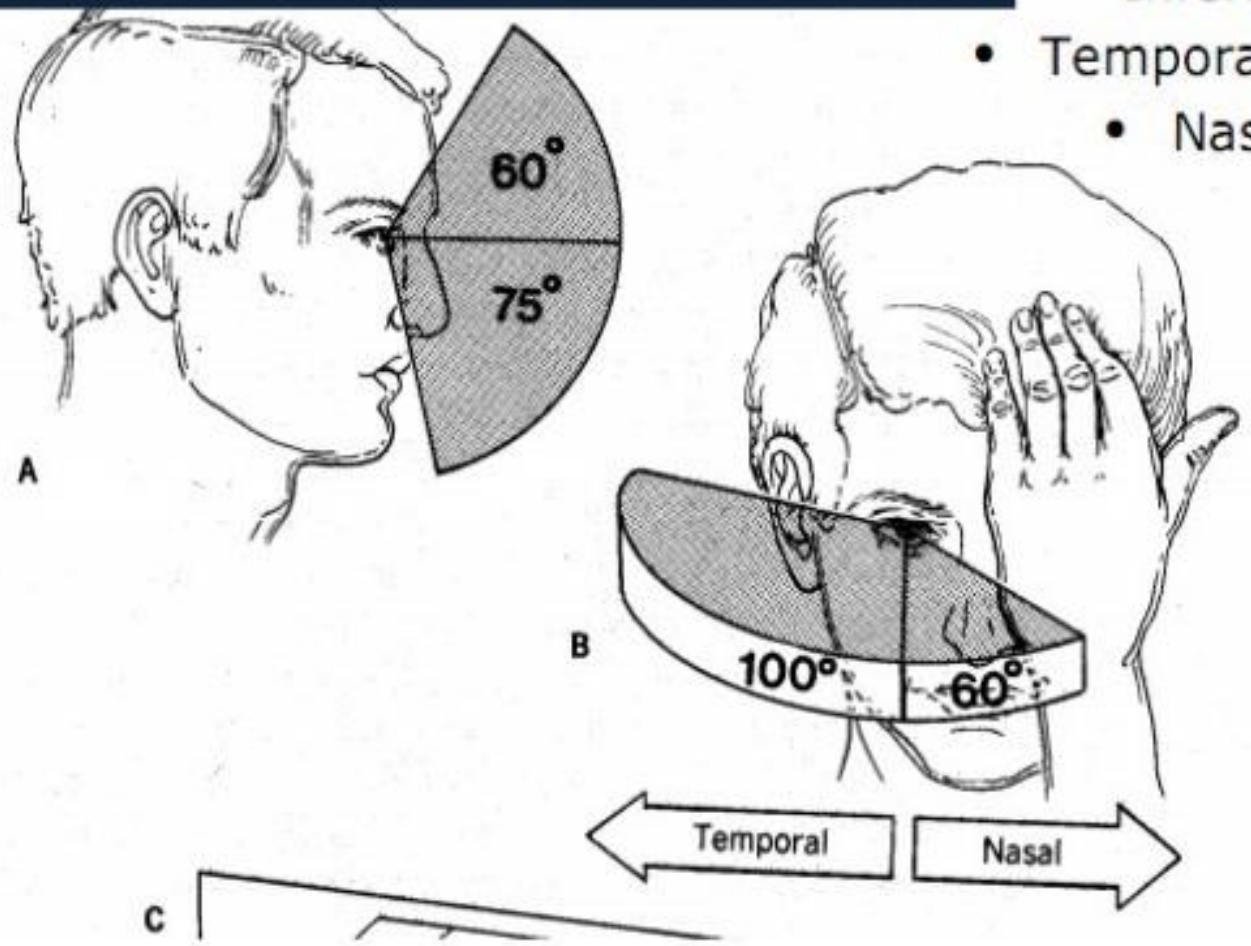
- Normal extent of field of vision with **5 mm** object in good illumination:
- Upward - 60 degree
- Temporal - 90 degree or more
- Downward - 70 degree
- Nasal - 60 degree

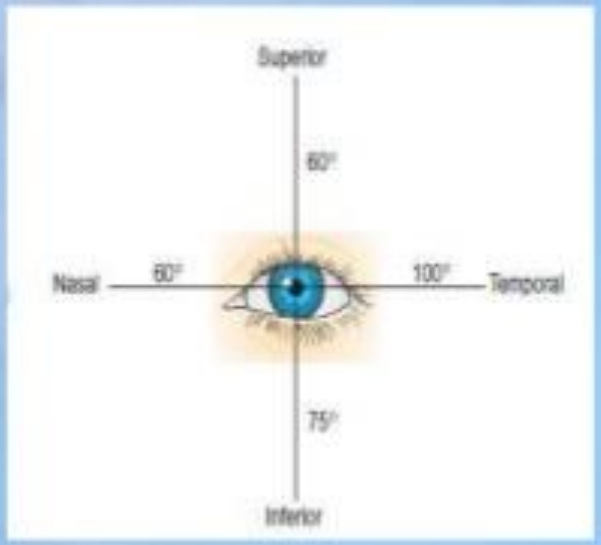

Nasal
Temporal
Field of vision
right eye

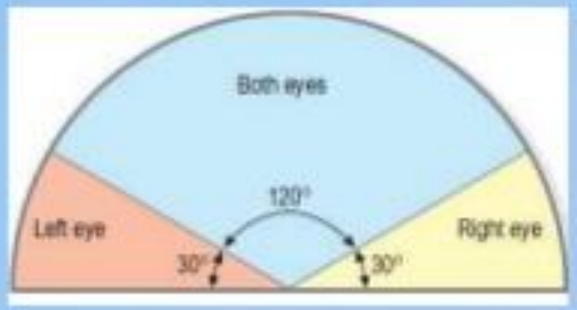
Normal limits of visual field

Classical limits (large, bright targets):

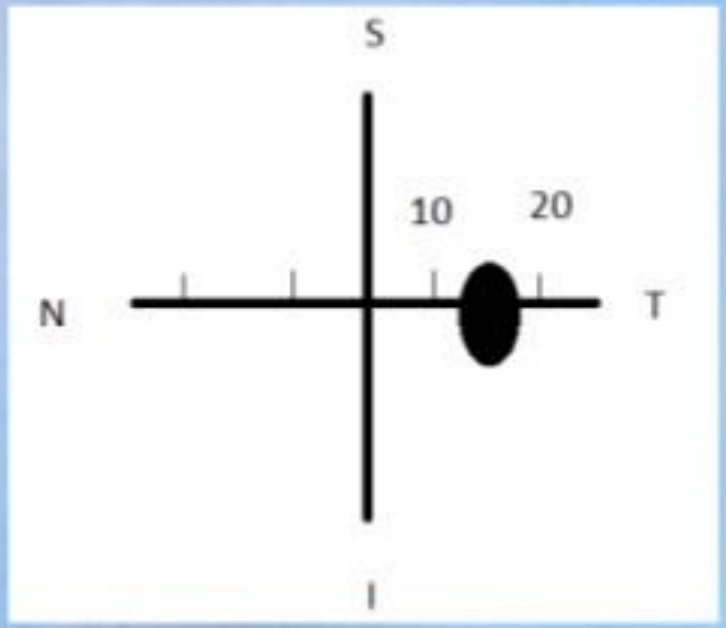
- Superior ~60°
- Inferior ~75°
- Temporal ~100°
- Nasal ~60°







Stereoscopic field



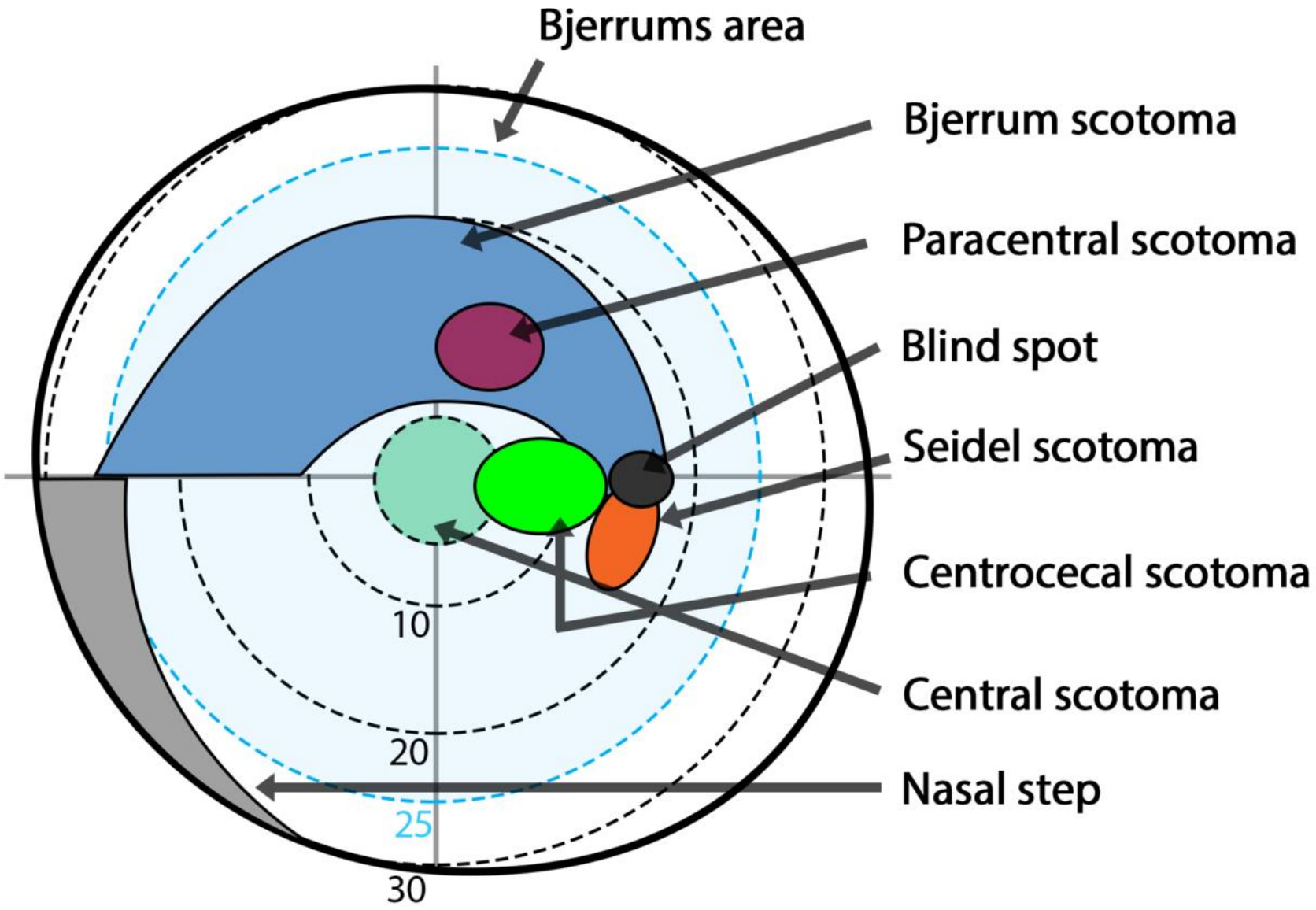
PHYSIOLOGICAL BLIND SPOT

Corresponding to optic nerve head

15 deg temporal to point of fixation

Span – 5 deg horizontal
-- 7 deg vertical

Two thirds below the horizontal meridian

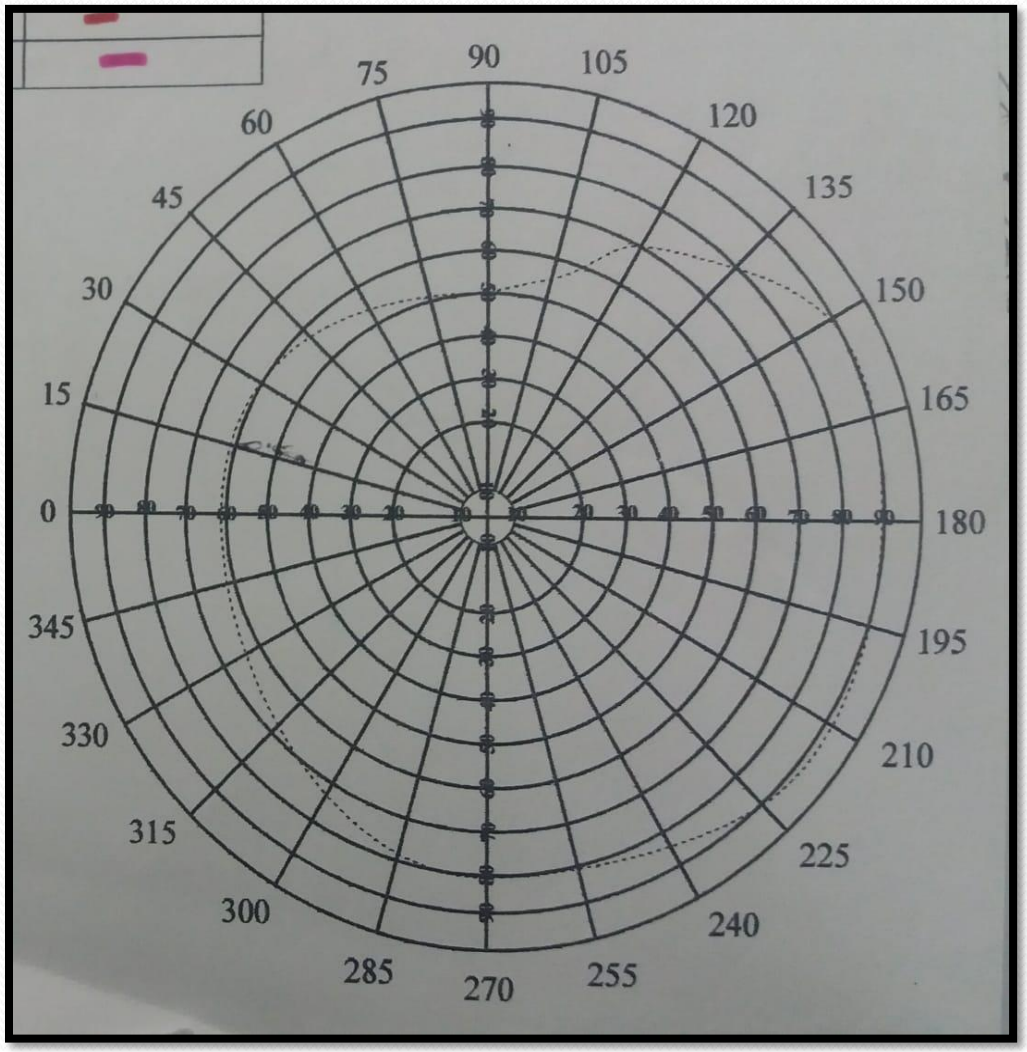

Bjerrums area
Bjerrum scotoma
Paracentral scotoma
Blind spot
Seidel scotoma
Centrocecal scotoma
Central scotoma
Nasal step
10
20
25
30

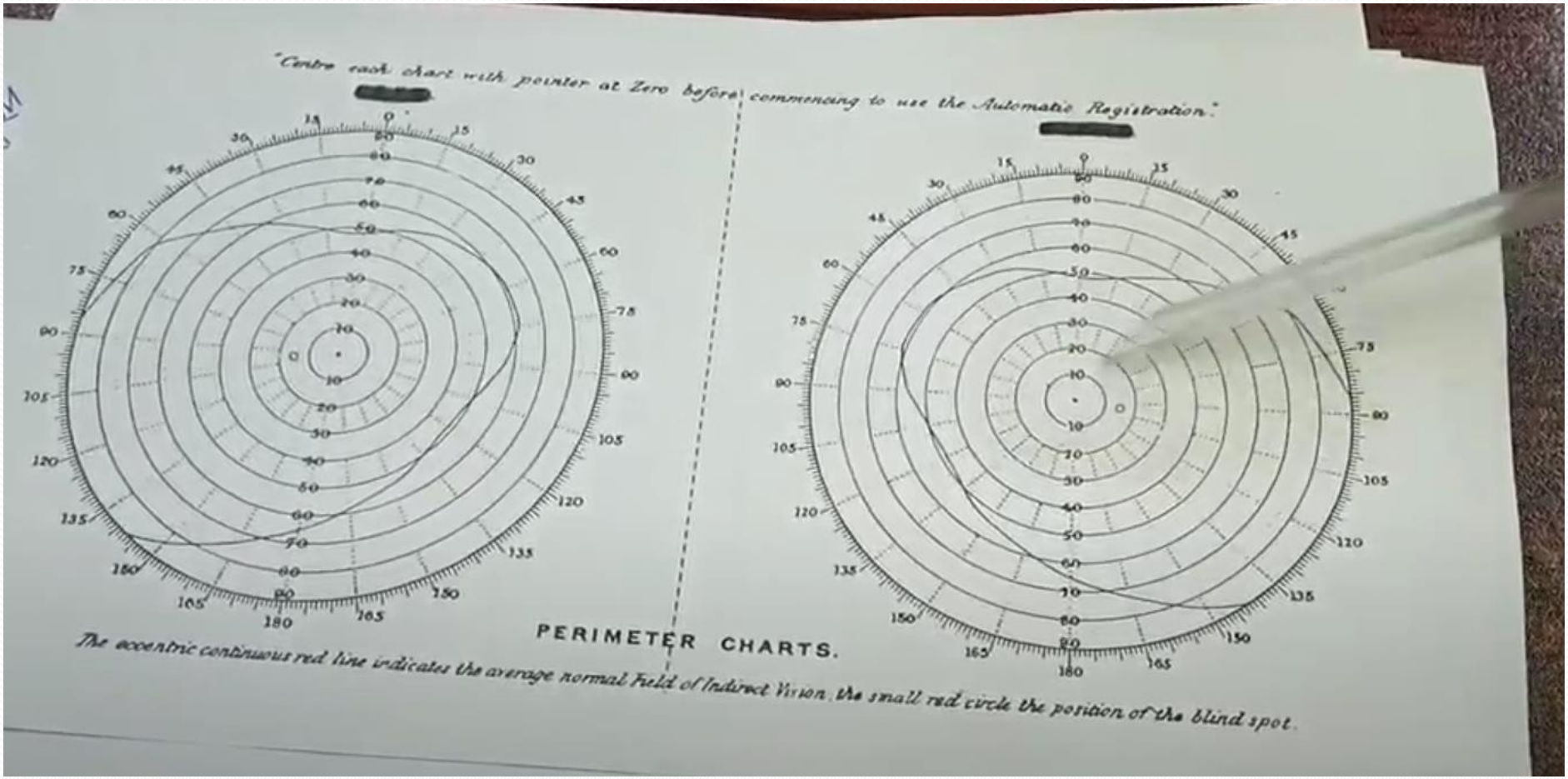
PERIMETER:

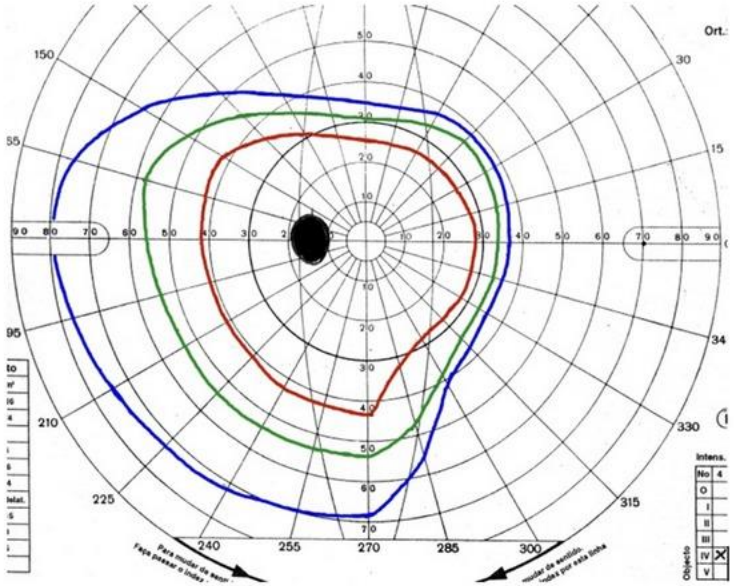
- It consists of **vertical stand** on which a **metallic arc** is pivoted which can be rotated in any direction
- Arc is graduated from **zero degree to 90 degree**
- A **test object** of **specific size and color** can be moved along the length of the arc
- The centre of the arc is occupied by 5 mm of **white circular spot** known as **fixation point or mirror**
- A **chin rest** and **leveling bar** is present at base to bring the eye of the subject at the level of fixation point
- A **scale** is present **behind the metallic arc to mark the extent of field of vision** in a particular **meridian**

PERIMETER CHART:

- It is a **graduated paper** used to record field of vision
- Central point of chart corresponds with **visual axis**
- The **concentric circles** are drawn at an interval of **10 degree** are called as **isopters**
- The **radii of the circles** are marked at **15 degree** intervals which denotes the various **meridians**




"Centre each chart with pointer at Zero before commencing to use the Automatic Registration."
PERIMETER CHARTS.
The eccentric continuous red line indicates the average normal Field of Indirect Vision. the small red circle the position of the blind spot.


Ort.
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O
I
II
III
IV X
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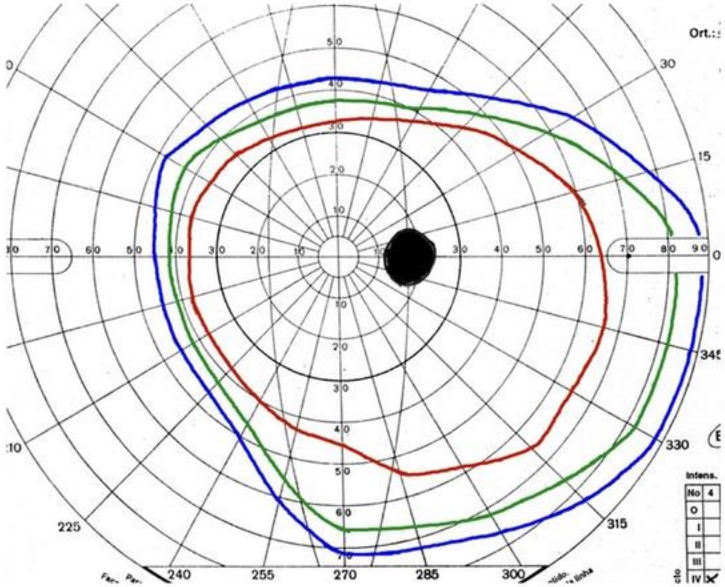
(a)


Ort.
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Intens.
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III
IV X

(b)

PROCEDURE:

- Place the **chart** in front of your eyes in such a way that **temporal field is on outer side**
- The subject is seated on adjustable stool so that the chin is resting on **chin rest** and face is vertical
- Adjust the height of the chin rest with the help of **leveling bar** so that the eye should be at the level of fixation point at the centre of perimeter
- Ensure **adequate illumination** and if subject wears the spectacles they should be removed
- Ask the subject to cover the other eye with the help of his palm and **fix the gaze** of the eye to be tested at fixation point

PROCEDURE:

- While the subject stares at the centre of the arc, bring the **object** from **periphery to the centre** along the **concave surface of semicircular arc**
- Select the size and the color of the object (5 mm, white)and **fix the arc** at one particular meridian
- Bring the object at peripheral end of the arc and move it from **periphery to centre**
- **Note down the angle** at which object is first seen by the subject
- **Mark the point** on the perimeter chart

PROCEDURE:

- The stimulus is subsequently moved to another meridian in the periphery out of view and advanced toward fixation again until the subject sees it
- By repeating these maneuvers at approximately **15° intervals** around 360° of the visual field, the examiner defines a series of points that can be connected to plot the field of vision on the chart
- Repeat the same procedure on the other eye

FACTORS AFFECTING FIELD OF VISION:

- Size of test object
- Color of object
- Contrast of test object with background
- State of object (moving or stationary)
- Illumination of object
- Nature of object (constant or flickering)
- Features of face of the subject

CONFRONTATION METHOD:

- Here the patient's field of vision is **compared** with that of observer having a normal field of vision
- This method gives **rough idea** of extent of visual field
- The examiner sits facing the patient at a distance of **1 metre**
- Heights of the two persons are adjusted so that the eyes of both are at the **same level**
- The patient covers his left eye and fixes his vision of right eye on examiners left eye

CONFRONTATION METHOD:

- The examiner closes his right eye and moves his hand in **from the periphery** between him and patient
- When he sees it himself the patient ought to say that he also sees it
- Be sure that subject should not take his eyes of the examiners eyes
- The movements of the hands are repeated in various parts of the field (**above, below, to left and to right**)
- **Repeat** the procedure for the other eye

Clinical Correlate

- Terminology:

Scotoma:

A scotoma is an **interruption or break in the visual field**, surrounded by a remaining normal visual field

- Types:

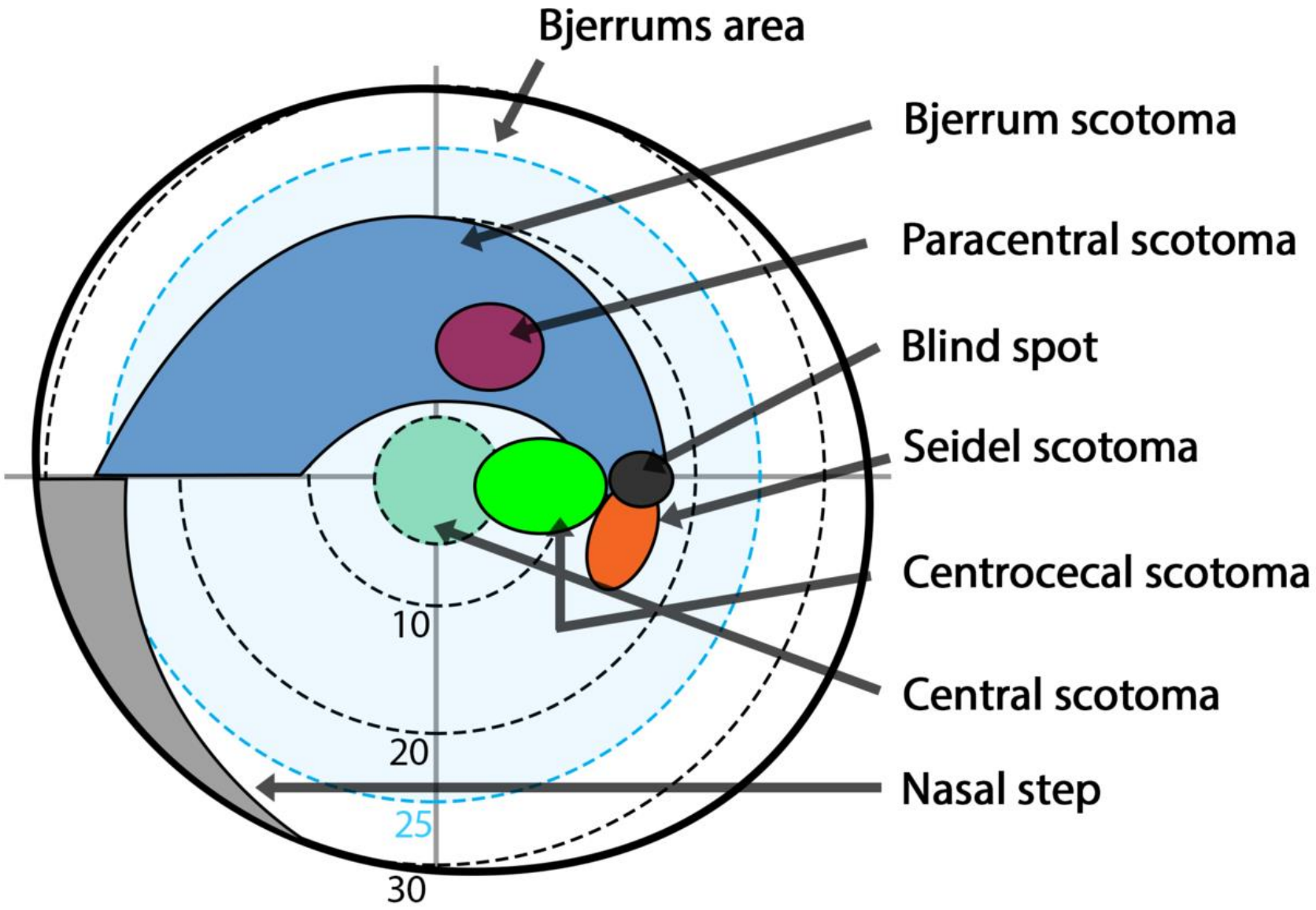
1. Central scotoma: It is perhaps the most troublesome type, as it's **a dark spot in the center of the field of vision**. The remaining visual field remains normal, often causing the patient to focus on the periphery, or outer boundaries, of the field. This makes daily activities such as reading and driving very difficult.

- A peripheral scotoma is a dark spot along the edges of the field of vision. While it does interfere with normal vision and all activities that depend upon that, it's not as difficult to deal with as a central scotoma.

- In a hemianopic scotoma, half of the visual field is affected by the dark spot. This can occur on either side of the center, and can affect one or both eyes, but usually affects them both. This is also sometimes called homonymous hemianopsia

- Paracentral scotoma:

Is a dark spot that occurs near, but not in, the central visual field.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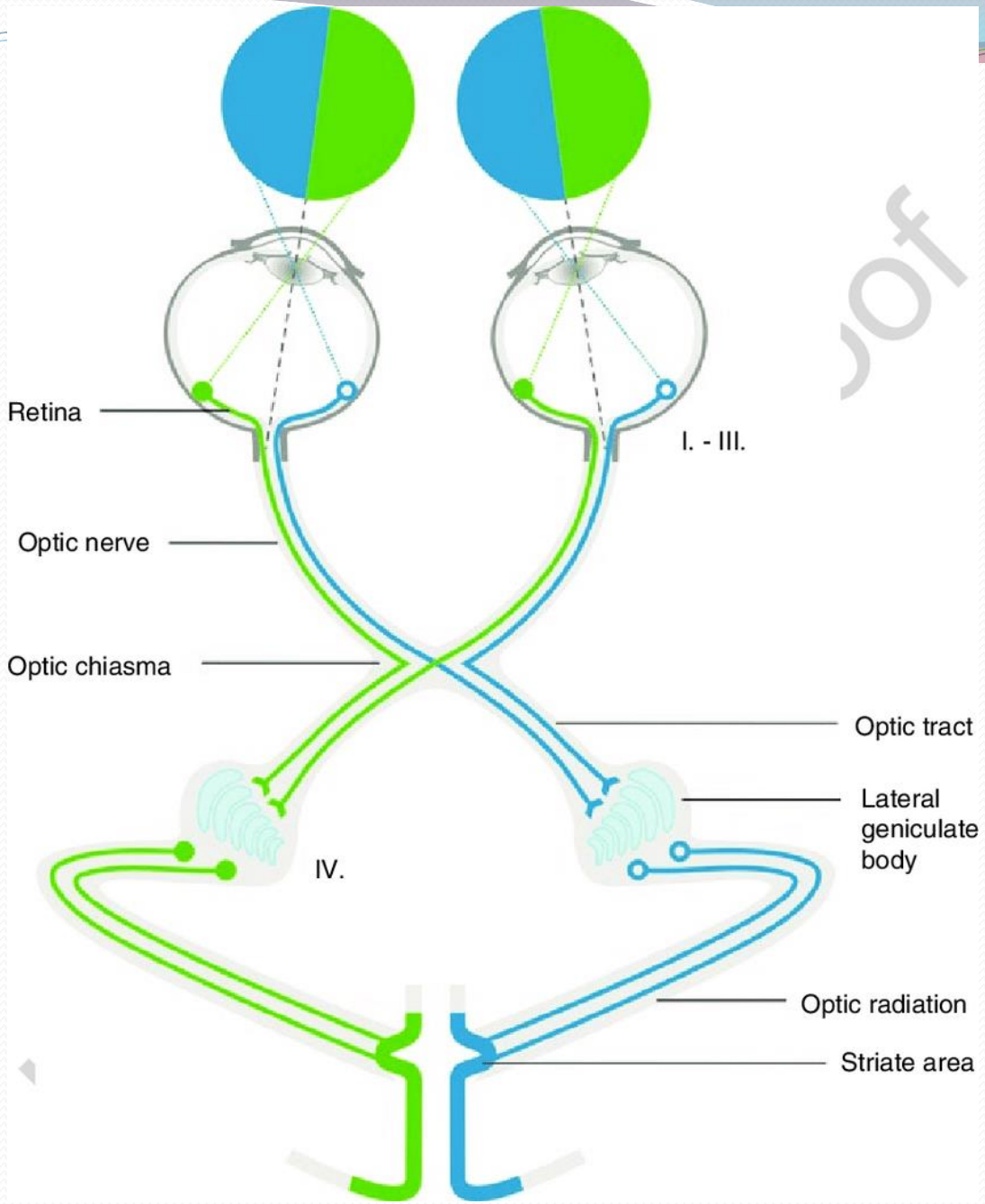
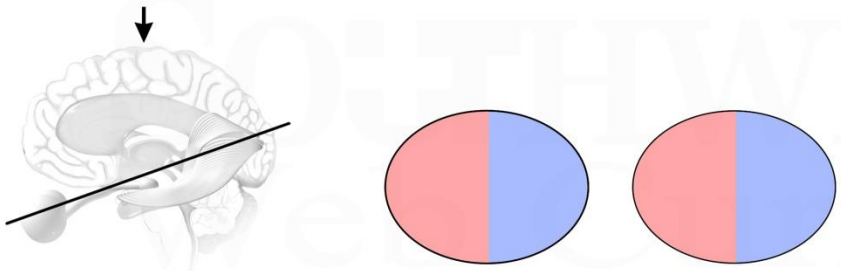
Viusal field defects

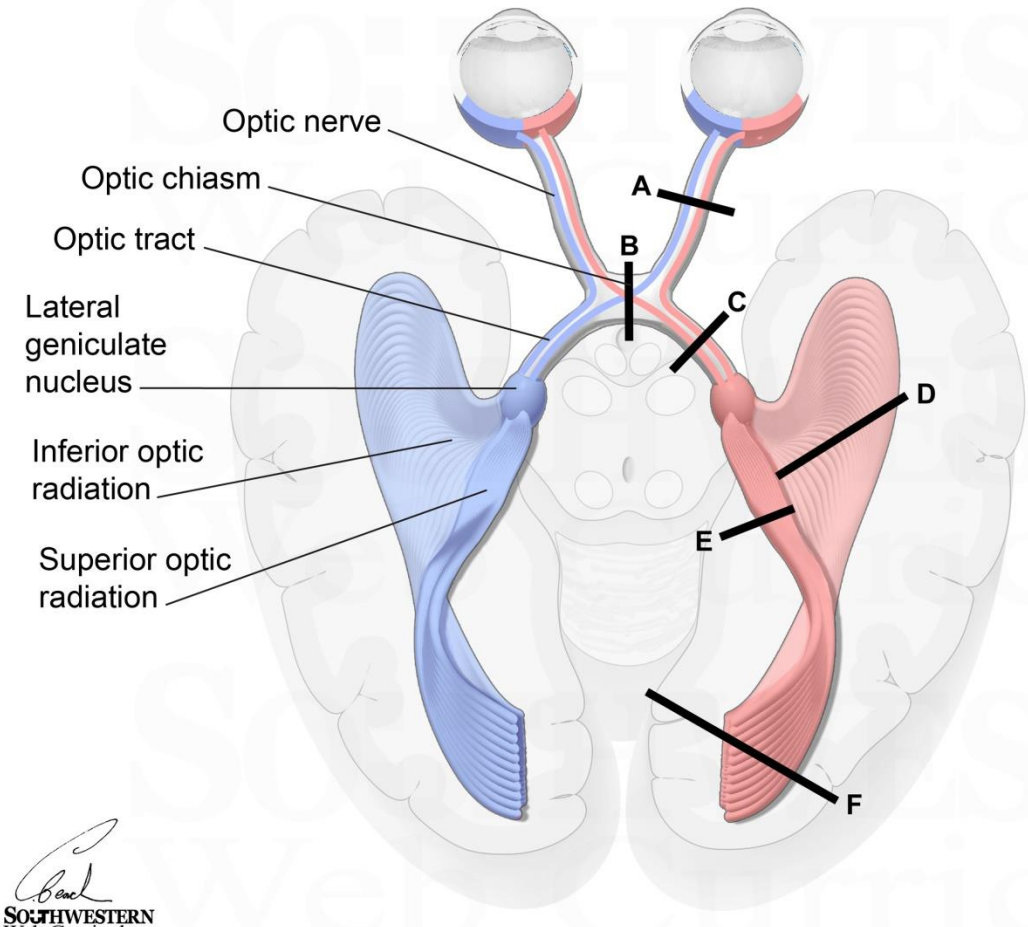
- Definitions:
- Anopia: complete loss of vision in the visual field of one eye.

Hemianopia: loss of vision in one half of the visual field (left or right*); usually applied to bilateral defects caused by a single lesion*

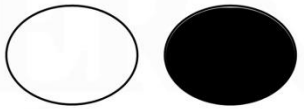
- Homonymous hemianopia: loss of half of the visual field on the same side in both eyes
- Heteronymous hemianopia: loss of half of visual field on different sides in both eyes.


Retina
Optic nerve
Optic chiasma
I. - III.
Optic tract
Lateral geniculate body
IV.
Optic radiation
Striate area

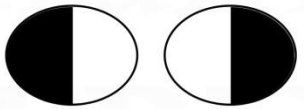




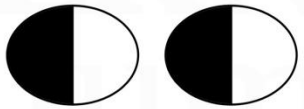
A. Ipsilateral monocular blindness



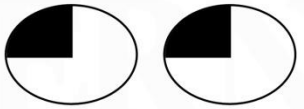
B. Bitemporal (heteronymous) hemianopsia



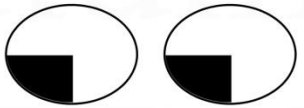
C. Contralateral homonymous hemianopsia



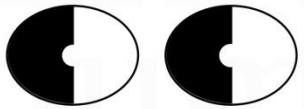
D. Contralateral superior homonymous quadrantanopsia

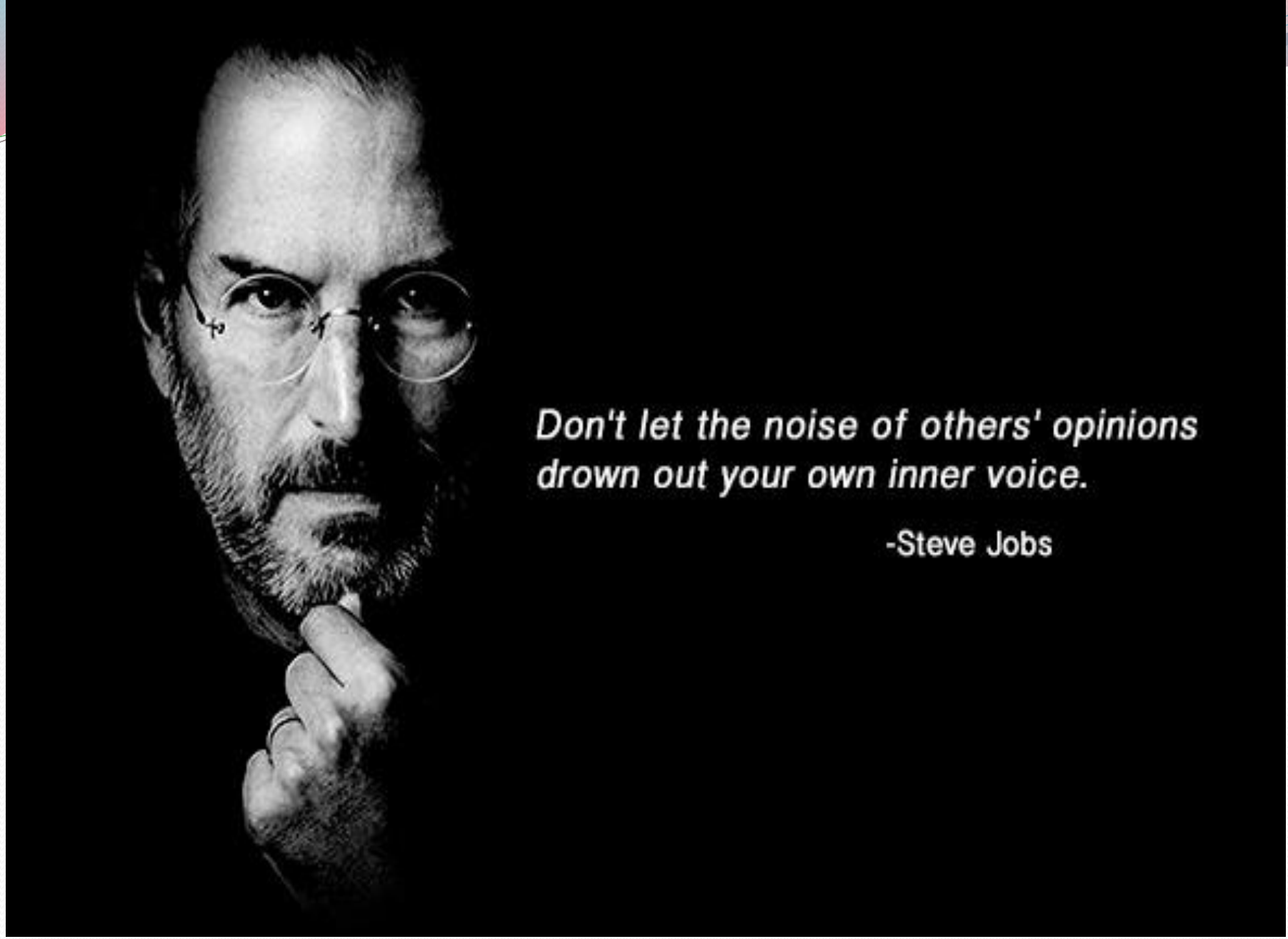


E. Contralateral inferior homonymous quadrantanopsia



F. Contralateral homonymous hemianopsia with macular sparing




Don't let the noise of others' opinions drown out your own inner voice.
-Steve Jobs