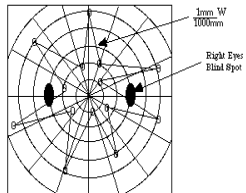


Why Do My Fields Look Like That?

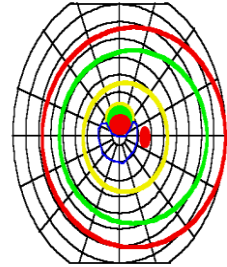


1

Whether you are doing HVF or GVF, finding the defect for the problem can be a confusing and often scary endeavor.

How do you find the problem? Better yet - **what** is the problem you are looking for?? Do you need to know what you will find **before** you find it?!

You need a plan before you begin !



2

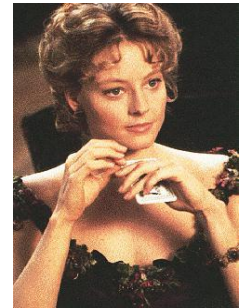
IF you know a few "tricks"..you will not get lost doing either HVF's or GVF's.

It's not crystal ball time... it's knowing the cheats ☺



3

In the movie "Maverick", Jodie Foster plays Annabelle Bransford... a card shark that had a very distinct "tell". A "tell" is a bad habit poker players do that inadvertently tips off other players to the type of hand **she** has. It is a "cheat" for her **fellow** card players.



community.flixster.com

4

Her "tell" was she would play with her ear lobe when she had a good hand. And Maverick would use that against her ! We can do the same thing with visual fields. With a little info (cheats) we can "predict" the field before we even start!



cinencuentro.com

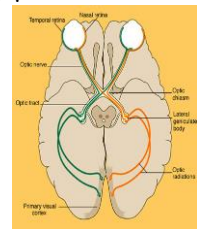
5

How ?

The visual pathway has (3) parts:

- * Prechiasm
- * Chiasm
- * Postchiasm

Each part of the pathway "does something" consistently...so...



aaa.org

6

Cheat # 1: Where is the Problem ?

For example:

Dry Macular Degeneration.

There will be a Macula scar. The macula is part of the retina. The retina is in the eye. When the problem is in the eye... we will in most cases have a **scotoma** in the place where the problem is (the Macula).

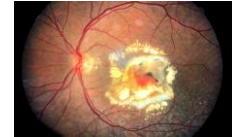
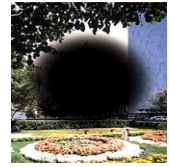
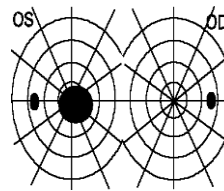
Macula = Fixation



7

Answer:

Central Scotoma



8

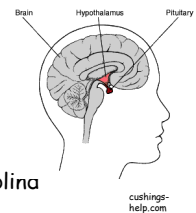
Cheat # 2:

**Certain Words Almost Always
Lead You To Where the
Problem is Located In The
Pathway and Therefore What
The Field Defect Should Be !**

9

Words ?

Pituitary: a. think temporal
b. think bitemporal hemianopsia



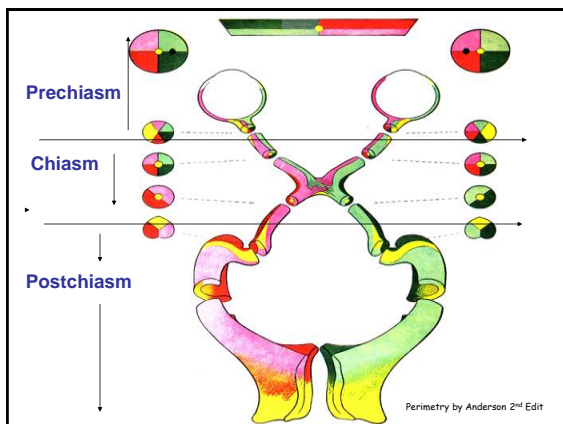
Papilledema:

a. think enlarged blina spot
b. think increased **intra**cranial pressure



eyepathologist.com

10

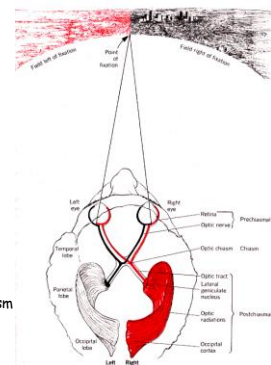


11

Visual Pathway:

- * Prechiasm
- * Chiasm
- * Postchiasm

Nerve fibers from each eye cross at the optic chiasm to the opposite side of the brain. So... light in the right (temporal) visual field of the right eye is seen by the nasal retina of the right eye and nerves carrying these impulses cross at the chiasm to the left side of the brain!



12

But... objects to the left of fixation seen by the right eye in its nasal visual field are picked up by the temporal retina of the right eye and nerves carrying these impulses from the temporal retina (see **red**) do not cross the chiasm but remain on the right side of the brain.

The point that divides the nasal and temporal halves of the retina is the fovea **not** the optic nerve.

13

Prechiasm: "Optic Nerve to Air"

Everything in the eye all the way back to and including the nerve.

- * cornea
- * lens
- * vitreous
- * retina
- * optic nerve

webvision.med.utah.edu

14

Problems with the System

1. Abnormal vision
2. Abnormal color vision
3. Abnormal pupils

Damaged Optic Nerve

15

Characteristics

- A. Monocular
UNLESS both eyes involved independently
- B. Respects the horizontal (only with nasal steps)
- C. Scotomas and Depressions
- D. Decreased vision
- E. Abnormal pupils
- F. Abnormal color vision

16

Visual Field Defects That Occur

- A. **Scotomas**
 - * central
 - * paracentral (within **20** degrees of fixation)
 - * Bjerrum or arcuate: **respects the horizontal**
 - * centrocecal

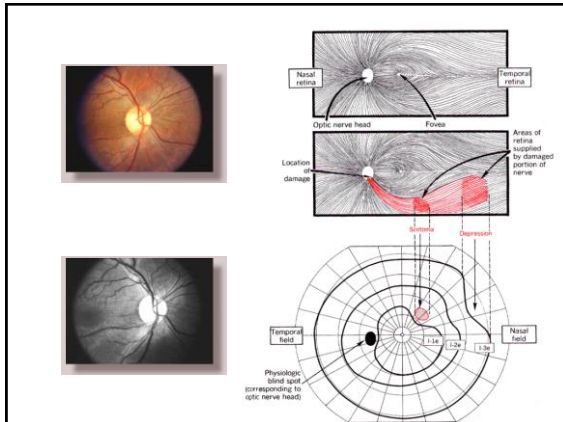
Perimetry by Anderson: 2nd Ed

17

- B. **Nasal Steps**
When a bundle of nerve fibers that enter the bottom of the optic disc is damaged in glaucoma, an **arcuate scotoma** occurs in the upper nasal visual field. Occurs sharply at the horizontal raphe.

Perimetry by Anderson: 2nd Ed

18

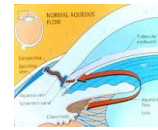
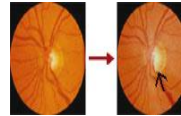


19

Glaucoma

Glaucoma is a triad disease processes:

- * **optic nerve** changes
- * visual field changes
- * higher than normal pressures (10 - 20 Hg mm)



berwickeye.com.au

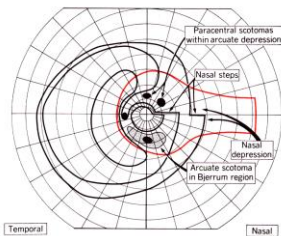
20

What Are We Looking For ?

Central & Paracentral Scotomas

Enlarged Blind Spot

Nasal Steps



Perimetry by Anderson: 2nd Ed.

21

Red Filter Tests

1. Optic Neuritis

Inflammatory neuropathy due to a number of reasons but most commonly from **demyelinating disease** - including MS.



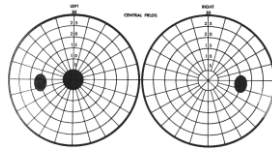
Retrobulbar neuritis occurs **behind the disk** so that the disk remains "normal" in appearance.

"The patient sees nothing and the doctor sees nothing"

22

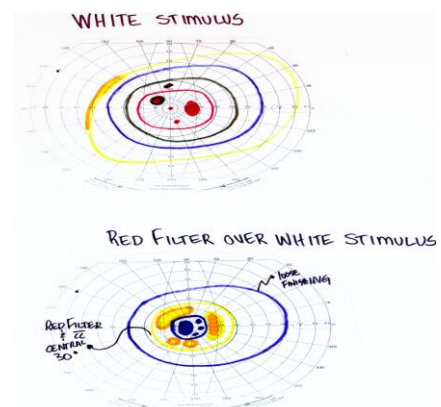
Signs and Symptoms

- * Mainly women (3:1)
- * Onset 3rd or 4th decade
- * Associated with MS in 85% of cases
- * Vision loss is usually at the 20/40 level for first attack
- * Decreased color vision
- * 90% have pain near eye with 50% having pain on movement
- * Vision will improve - but will eventually relapse due to CNS demyelinating disorder



Testing the Field Of Vision: Anderson

23



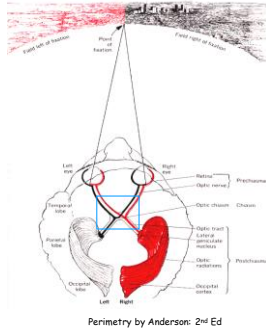
24

Chiasm

That place in the brain where **binocular vision first occurs**.

Most common defect:
bitemporal hemianopsia

Most common problem:
pituitary tumor



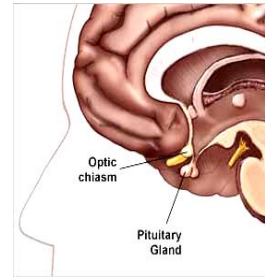
Perimetry by Anderson: 2nd Ed

25

Characteristics

In most cases:

- * vision is normal
- * pupils are normal
- * color vision is normal
- * respects the vertical
- * defects in the temporal area



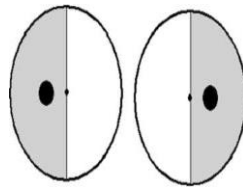
gwc.maricopa.edu

26

Bitemporal Hemianopsia

"Classic Field Defect"

Pituitary tumor is pushing **DOWN** and **UP** on the chiasm.



visual-field.com

27

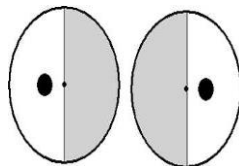
What The Patient Sees



28

Binasal Hemianopsia

Tumor is **pushing on the chiasm from the sides**. This can be caused by sclerotic internal coronary arteries.



visual-field.com

29

What The Patient Sees



en.wikipedia.org

30



Junctional Scotoma

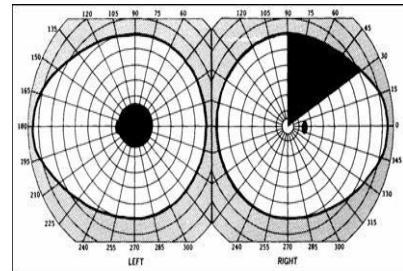
Whenever you have a "blind" eye (dense central scotoma), check the superior temporal side of the fellow eye!



I classify "blind" as anything worse than 20/80 due to a central scotoma.

31

Junctional Scotoma



Testing the Field Of Vision: Anderson

32

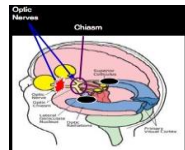
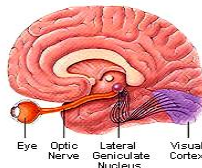
Postchiasm

Postchiasm is 2/3rds of the visual system.

Consists of the following:

- * Optic Tract
- * Lateral Geniculate Bodies
- * Optic Radiations
- * Occipital Lobe

"Occipital is identical"

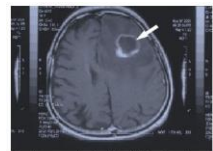


ssc.education.ed.ac.uk

33

Problems with the System

- A. Stroke
Cerebrovascular Infarct
- B. Tumor
- C. Trauma
Subarachnoid hemorrhage



Magnetic resonance imaging showing brain tumor (arrow)



drafthouse.com

34

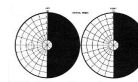
Characteristics of Postchiasm

- A. Defects OU
- B. Respect the vertical
- C. Further back into the system, the more alike (congruous)
- D. Vision is normal
- E. Pupils are normal
- F. Fundus normal .. Brain tumor may cause papilledema or pale disc

35

Phrases We Can Use

Congruous = symmetrical
look like carbon copies



Incongruous = asymmetrical



36

Homonymous = same side affected in each field



Heteronymous = opposite side affected in each field



37

The more **anterior** you are in the postchiasm system (i.e. closer to the chiasm side) the **less congruous** the fields are. The more **posterior** you are in the postchiasm the **more alike** the fields are to a point that when you are at the **occipitals** - they are **identical**!

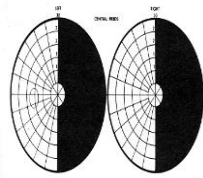


Warnerbrothers.com

38

Macula Sparing

- The hemianopia will **avoid** fixation
- Indicates the lesion or injury is more **posterior** in the postchiasm system

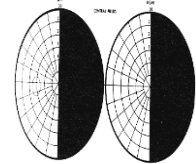


Testing the field of vision: Anderson

39

Macular Splitting

- Hemianopia is rigidly adherent to the vertical meridian
- Indicates lesion or tumor is located more **anteriorly** in the postchiasm



Testing the field of vision: Anderson

40

Occipital Tract:

- *incomplete
- *incongruous
- *homonymous hemianopia
- *starts as quadrants that spare and progresses to macular splitting.
- *usually pituitary tumor

Lateral Geniculates

- *incongruous
- *homonymous hemianopia
- *tumor usually not found until autopsy

41

Optic Radiations:

- *most commonly caused by stroke
- *defects usually permanent
- *tumors/injuries rare
- *Homonymous Hemianopia

Occipital Lobe:

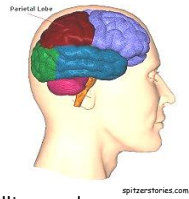
- *stroke or trauma
- *identical defects

42

Parietal Lobe Tumors

Hallucinations:

- * **formed**
people, trees, boats
- * **unformed**
lightning or colored streaks



LISTEN to what the patient is telling you !

" Just because someone is "off the beam" *doesn't* mean they can't have a brain tumor as well ! "

43

The story of Bert.....

or..... when not to jump
to conclusions...



+



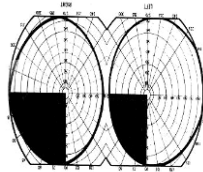
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44

" Pie on the Floor"

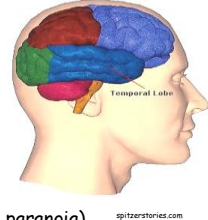
- Can be congruous or incongruous
- IF a defect does not take up the majority of the quadrant it is a **sector defect**. IF it takes the **full quadrant**, it is a **quadrantopia**.
- IF **right parietal lobe injured**, will have **left inferior quadrantopia**



45

Temporal Lobe Tumors

- Symptoms of temporal lobe damage:
 - * disturbance of auditory perception
 - * visual disturbances
 - * altered personality and affective behavior (increased aggression and paranoia)
 - * altered sexual behavior
 - * altered language comprehension
 - * disturbance of memory

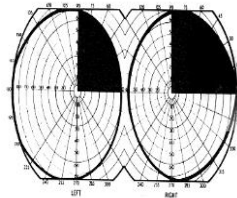


46

" Pie in the Sky "

Same principal as
Pie on the Floor

Where is this
defect in this
example ??



47

Gain versus Hysterical

Gain

By feigning blindness the patient is trying to "gain" something. Usually a **financial** gain. Blatantly tries to "prove" they cannot see by tripping over objects, missing chairs when they sit. **5 degree fields**



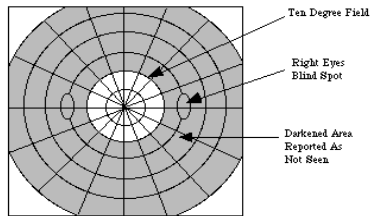
Hysterical

Truly believe they are blind. Usually they have been traumatized. Very cooperative during exam. In most cases, need psychological help to fix the issue - hopefully regaining vision. No fields.. "blind".



48

5° Fields: "Tubular Fields"

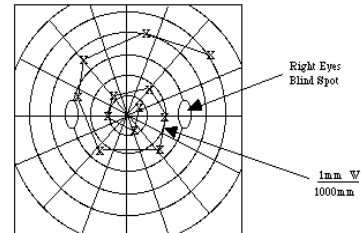


Tubular Field: The field size remains the same regardless of testing distance or target size

opt.indiana.edu

49

Fatigue Fields: Spiral



Spiral Field: Patient Responses Keep Collapsing In Toward The Central Field

opt.indiana.edu

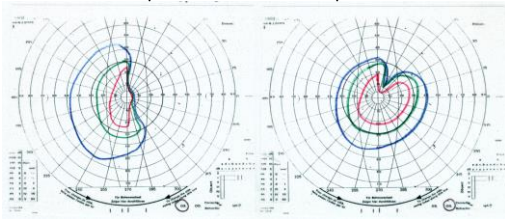
50

Ready, Set.....GO !

Congruous or Incongruous? Can we use these phrases?

Chiasm Postchiasm Prechiasm

Anterior Pathway or Posterior Pathway?



51

And.....

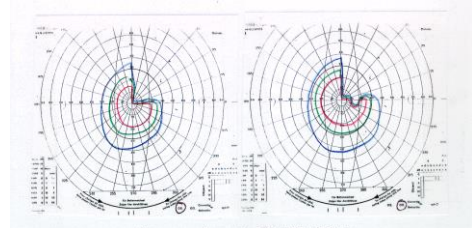
What is the defect?

What has caused it?

Chiasm

Prechiasm

Postchiasm



52

How about a little HVF Action !

Which eye ?

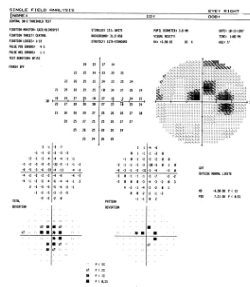
What is defect seen?

Prechiasmal

Postchiasm

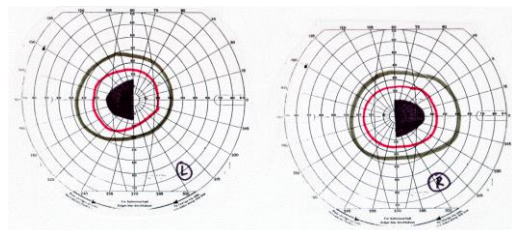
Chiasm

What's the problem?



53

Be Very Careful Stepping Off That Cliff... The First Step's A Doozy ☺



54