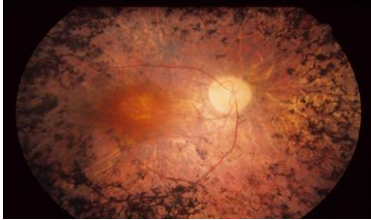


## Technicians and Tough Visual Fields: Are You Missing The Clues?



Eyesoncanbodia.wordpress

## What Processes Can Cause "Tough" Fields?

- RED FILTER FIELDS (Toxic vs MS):
  - Plaquenil
  - Hydroxychloroquine
  - Ethambutol
  - Multiple Sclerosis
- Pituitary Tumor - Junctional Scotoma
- Retinitis Pigmentosa /USHER's Syndrome
- "I cant find anything - go do a field"

## FRIDAY AM 800 AM ADD ON

The front desk person came back to say we had an add on from the ER.  
38 y.o. woman, c/o decreased vision in her right eye and weakness that comes and goes. Wanted to be seen and done by 930 AM as she had an important meeting she was leading. Do CX to see if she has any fundus problems (plaque, hypertension changes???)



At 8:10 I walked out, called her name and this is what greeted me...."You're late".

She didn't want an exam, she didn't feel any questions were pertinent - and she wanted the doctor - not me.



Vision sc: 20/40 OD, 20/20 OS.  
Refraction: -0.50 sph (20/30-2)  
                  -0.50 sph (20/20+)

Pupils: No APD OD, but not as brisk as OS. (MD agreed)

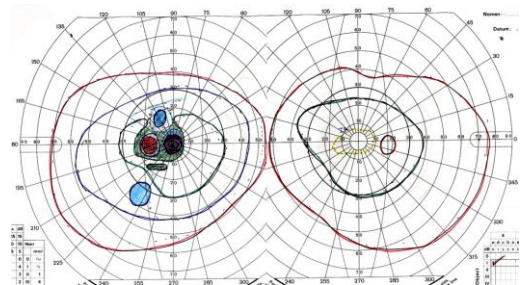
## History

Noticed her vision changes x 1 week. No other remarkable history. But when I pushed her regarding any other changes - she stated that she noticed when she ran she would feel really spent afterwards, and her foot would drag a little. Same thing happened happened after the hot tub - and sex. I checked her color vision - and she did poorly. So..... I did a RED FILTER GVF.



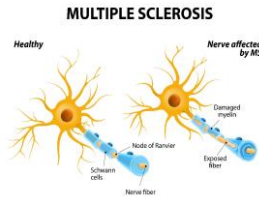
Warnerbrothers.com

## Retrobulbar Neuritis: Red Filter Visual Fields



## Retrobulbar Optic Neuritis – MS?

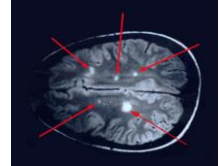
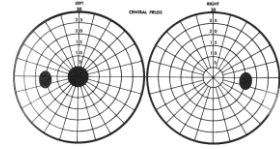
Multiple sclerosis (MS) is an auto immune, demyelinating disease that affects the nerve sheathings in the brain and spinal cord.



contactlenses.co.uk

## 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



Symposium.com

## Optic Neuritis vs. Papilledema

### Optic Neuritis

*"papillitis"*  
loss of vision  
pupils sluggish  
central scotomas  
unilateral  
Less elevation  
of nerve head

### Papilledema

*"choked disc syndrome"*  
normal vision  
normal pupils  
enlarged blind spots  
bilateral  
↑ nerve head elevation

## Toxic/Nutritional Neuropathies

Table 1: Drugs with known adverse effects on the optic nerve

Retrobulbar or optic neuritis	Interferon alpha, beta, or gamma	Sulfamethazine
Acetohexamide	Iodide and iodine solutions and compounds	Sulfamethizole
Acetyldigoxin	Iodochlorohydroxyquin	Sulfamethoxazole
Alcohol	Iodoquinol	Sulfamethoxyypyridazine
Allobarbitol	Isoniazid	Sulfanilamide
Aminopyrine	Isoretinoin	Sulfaphenazole
Amobarbital	Lanatoside C	Sulfapyridine
Agrobarbital	Measles and rubella virus vaccine live	Sulfasalazine
Barbital	Measles, mumps and rubella virus vaccine live	Sulfathiazole
Bromisovalum	Measles, mumps and rubella virus vaccine live	Sulfisoxazole
Bromquinoline	Measles virus vaccine live	Sulindac
Butabarbital	Measles virus vaccine live	Talbutal
Butalbital	Mephobarbital	Tamoxifen
Butallylonal	Metharbital	Tetanus immune globulin
Butethal	Methisural	Tetanus toxoid
Carbamphen	Methohexital	Thiamylal
Carbromal	Methyl alcohol	Thiopental
Carbamustine	Methylengonovine	Tolazamide
Chlorazephenical	Methysengide	Tolbutamide
Chlorpropamide	Metronidazole	Trichloroethylene
Cisplatin	Minoxidil	Trypsinamide
Clindamycin	Mumps virus vaccine live	Vinbarbital
Cyclobarbitol	Nagroxen	Vinblastine
Cyclopentobarbital	Nortriptyline	Viscristine
Deferoxamine		

## When to Do Red Filter Visual Fields

- Plaquenil fields
- Hydroxychloroquine fields
- Ethambutol
- IF patient is suspected of having **MS**
- If patient is suspected of having **optic neuritis** or **retrobulbar neuritis**

## Plaquenil Retinopathy

Plaquenil (hydroxychloroquine) & Chloroquine are anti-inflammatory and antimalarial. They can be used alone or in combination with other medications for rheumatoid arthritis. It helps to reduce pain, stiffness, and swelling in the joints. It can also be used for **Lupus**.



weber.ophth.uiowa.edu

## Chloroquine or Hydroxychloroquine Amblyopia

Antimalarial drugs that are also used in the treatment of **Lupus** and **Rheumatoid Arthritis**.

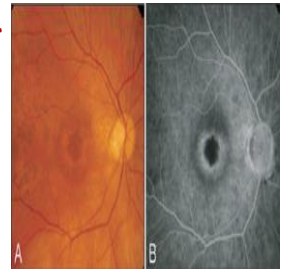


Defects are large, central scotomas. Use **Red Filter Test !**

## Toxic Macular Disorders

### Bull's Eye Maculopathy with Ethambutol (TB med) or Plaquenil

Abnormal ERG with loss of cone function. Your doctor may see a "mottling" of the fovea area. Important to do **COLOR VISION TESTING** as well as VF 10-2. IF do a GVF - do a red filter test to hyper check the cones..



retinalphysician.com

## Ethambutol Amblyopia

- \* Ethambutol is used in the treatment of tuberculosis
- Defects will be *central* or *centrocecal* scotomas of various depths
- Decreased color vision !
- Do **RED VISUAL FIELDS**



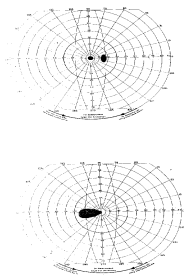
## Lead Amblyopia

- Often associated with children of lower socio-economic means living in cities
- Also seen with painters and gasoline attendants (lead gas)
- Fumes or paint are *absorbed through the skin*
- Can eventually cause papilledema and optic atrophy due to **chronic** exposure



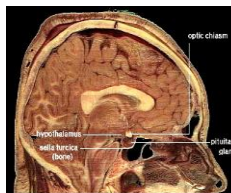
## Classic Field Defect: Tear Shaped Centrocecal Scotoma

Tear shape points at fixation in one eye. IF there is optic nerve damage due to chronic papilledema, the defects will be permanent !



## Pituitary Gland (Hypophysis)

Hangs by a "stalk" from under the hypothalamus. Two parts: Anterior pituitary (glandular tissue) and the posterior pituitary (nervous tissue).



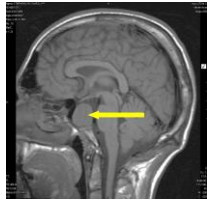
Called the "master gland" because it controls so many other endocrine glands.

vivo.colostate.edu

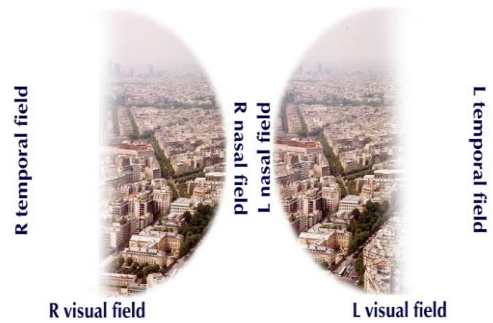
A pituitary adenoma is a benign (not cancerous) tumor found of your pituitary gland.

Patients c/o of headaches and changes in vision among other things.

The "change of vision"? Loss of side vision - listen to their complaints!

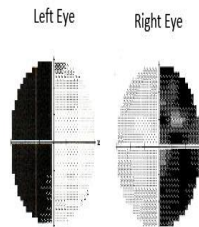


quazoo.com



en.wikipedia.org

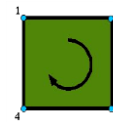
This is a CHIASM visual field defect that occurs in the **temporal** visual field of each eye. The classic visual field defect is a **bitemporal hemianopsia**, but... it can progress clockwise in the right eye and counterclockwise in the left eye.



nec.com

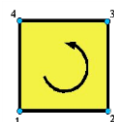
## Progression of the Defects

### Right Eye



Defect progresses in a clockwise fashion. When tumor or bleed resolves, the damage will reverse itself to some degree

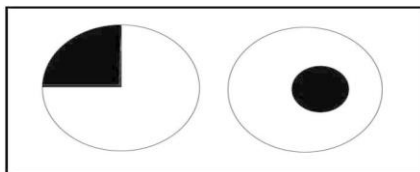
### Left Eye



Defect progresses counterclockwise. When the tumor or bleed resolves, the damage will reverse itself to some degree.

## So.... What is this ?!

- "Blind" one eye
- Temporal defect in the other eye

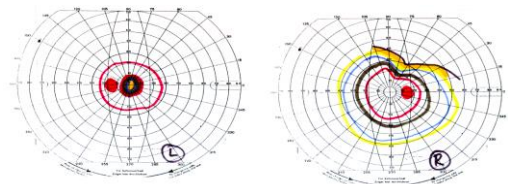


Junctional scotoma

studyblue.com

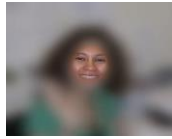
## Junctional Scotoma

Whenever you are doing a field, and the patient has one "blind" eye, always check very carefully **superior temporally in the fellow eye**! I consider "blind" an eye with a dense central scotoma (20/80 VA or worse).



## Retinitis Pigmentosa

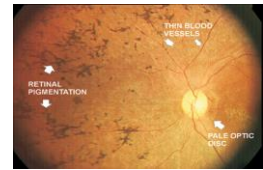
A genetic disorder of the eyes that causes loss of peripheral vision due to **ROD** dystrophy. Usually occurs in young males. Symptoms include: difficulty with night vision and decreased peripheral vision. Onset is generally gradual. As peripheral vision worsens, patients may experience "tunnel vision". Complete blindness is uncommon, but central vision can be affected due to cone "drop out" as well.



rp cure.net

Findings in the retina have been characterized as the "ophthalmic triad". This includes:

- \* a "mottled" appearance of the retinal pigment epithelium (RPE)
- \* bone spicule formation
- a waxy look to the optic nerve
- weakening of blood vessels in the retina

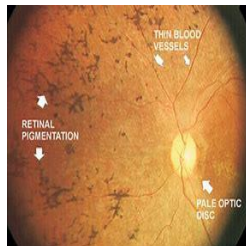


herbal-care-products.com  
Wikipedia.com

## Normal vs. RP Fundus

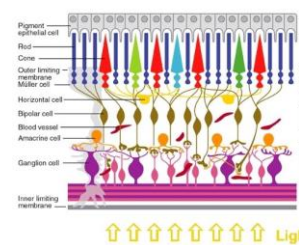


webeye.ophth.uiowa.edu

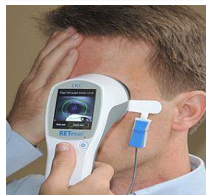


dxline.info

## Layers of the Retina



101proofsforged.blogspot.co  
m



A contact lens electrode to the eye is used - a bright light is flashed. Patients with the RP trait would show decreased /delayed electrical response in the **photoreceptors** (rods & cones).

If a dim flash ERG is performed on a dark-adapted eye, the response is primarily from the rods. Flash ERGs will reflect the activity of the cones. Bright flashes will show ERGs with an a-wave (initial negative deflection) followed by a b-wave (positive deflection). (Wikipedia)

## Basic ERG in a normal patient

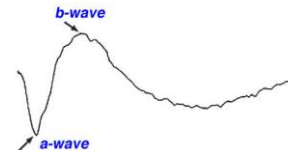


Fig 1 The biphasic waveform of the ERG of a normal patient.

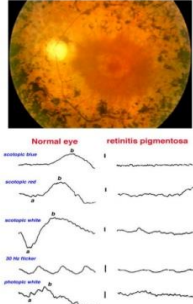
webvision.unh.es



### RETINITIS PIGMENTOSA :

➤ A full field ERG in RP shows marked reduction in both rod & cone signals although *loss of rod signals is predominant*.

➤ There is significant *reduction in amplitude of both a & b waves of ERG*.

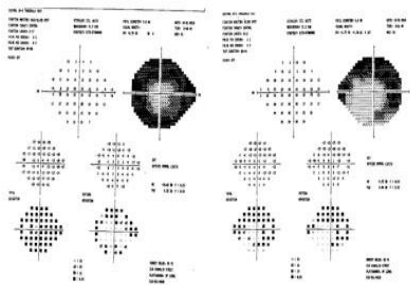


Slideshare.net

When doing a GVF, it is important to NOT start too far "in" or you may miss islands. Very often fields appear "gun barrel" for this very reason - islands were missed because the tech started in too close.

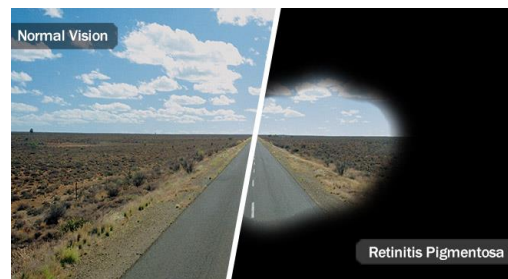


### "Gun Barrel " (Tunnel Vision)



heallo.com

### What The Patient May See



webmd.com

### Non Pigmented RP

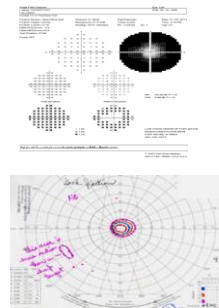
Atypical cases of RP are common and often occur when you do not see the usual pigment changes in the fundus.



retinagallery.com

### Usher's Syndrome

A rare genetic disorder caused by a mutation in the genes resulting in a **combination of hearing loss and visual impairment**. It is a leading cause of deaf/blindness and is incurable at this time. The progressive blindness of Usher syndrome results from the retinitis pigmentosa. Testing is the same.



omnieyesurgery.com Webeye.com

Usher's occurs in roughly 1 deaf person in 23,000 in the United States. People with Usher syndrome represent roughly 1/6<sup>th</sup> of people with retinitis pigmentosa.

People with Usher are born profoundly deaf and begin to lose their vision in the first 1-2 decades. First visual complaints are often night blindness (*nyctalopia*)

(Wikipedia)

## Usher Syndrome Three Types

	Type 1	Type 2	Type 3
<b>Hearing</b>	Profound deafness in both ears from birth	Moderate to severe hearing loss from birth	Normal at birth; progressive loss in childhood or early teens
<b>Vision</b>	Decreased night vision before age 10	Decreased night vision begins in late childhood or teens	Varies in severity; night vision problems often begin in teens
<b>Vestibular function (balance)</b>	Balance problems from birth	Normal	Normal to near-normal; chance of later problems

Slideshare.net

## Nyctalopia



Normal Vision

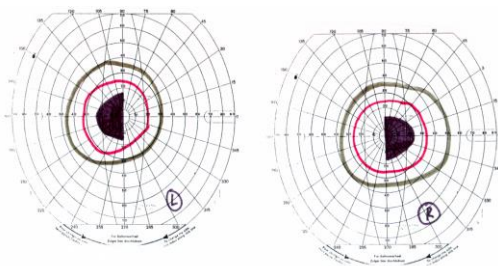
Night Blindness

## Vitamin A

- For people with Usher Syndrome and Retinitis Pigmentosa a daily dose of 15000 International units of Vitamin A Palmitate (only) has been shown to slow the degeneration of the cone ERG. A blood test must be taken to ascertain liver function and Vitamin A levels in the blood BEFORE taking this treatment.

Slideplayer.com

## What Is This ?!



Scotomatous Hemianopsia..... CHIASM.....temporal!



dgraves@stpaulseye.com