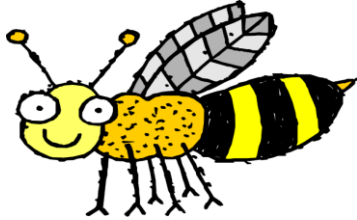


## Buzz Words For Technicians



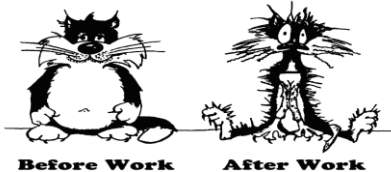
## Words or Phrases That Catch My Attention

- Pupils: What Is PERRLA?
- Why Do We Check Pupils At Near ?
- Cycloplegia versus Mydriasis
- Recurring Iritis: What to Ask and Who Do I Focus What Questions On



... and Don't Forget These 😊

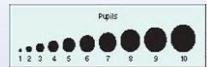
- Blurry Vision, Fluctuating Vision, Vision Comes and Goes
- Eye Bulging Forward
- My Child's Picture Looks Funny



## PERRLA

The acronym PERRLA is often used to record data from pupillary testing

- PE: pupils equal
- R: round
- RL: reactive to light (direct and consensual)
- A: responsive to accommodation (near target)



Optometrytimes.com

## Pupillary Reaction

**Parasympathetic innervation** causes pupillary constriction. The *sphincter* muscle is responsible for this action. It is a circular muscle whose fibers encompass the pupil.

**Sympathetic innervation** causes pupillary dilation. Dilation is controlled by the dilator muscle, a group of muscles in the peripheral 2/3 of the iris.



animatedgif

## Direct Versus Consensual



Figures 3. Observing the pupillary response to light. Direct pupil response OD and consensual pupil response OS.

optometrytimes.modernmedicine.com

## Hippus

**Hippus** is a spasmodic, rhythmic, regular dilating, and contracting, of the pupil between the sphincter and dilator muscles. It is **physiologic** (normal) and very common in many people.

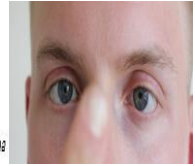
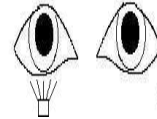
I basically describe it as your pupil is disco dancing!

A normal pupil should constrict when you shine a light into the eye (direct) or when the patient focuses on a near object. While the first action is down it will then go up and down and up and down! BUT....the first action is DOWN!



## Pupil Constriction on Convergence (Accommodation)

1. Ask the patient to focus on a distant target.
2. Then ask them to focus on a closer target (a finger or pencil tip - not penlight!).
3. A normal accommodative reflex of the eyes crossing causes the the pupils to constrict.



Mncophthal.com

## So....Why Do We Have Patients Follow The Pencil To Their Nose (Cross Their Eyes?)

When I've asked this question during class, people will often respond that it is to see if they can cross their eyes. If they can't, they may have problems with reading and strain. While this may be true, - one larger reason is to watch their pupils to ensure that when they converge, their pupils

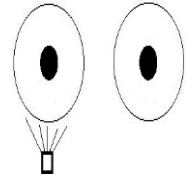
**CONSTRUCT.** (One neurologic problem with no constriction on accommodation is Argyll Robertson pupil in patients with neuro-syphilis)



## What Does An APD Look Like ?

EX: The direct, and consensual, pupillary responses to light are normal (constriction). The **swinging flashlight** test shows abnormal light response of the affected eye (dilation followed by constriction).

For example: if the left eye were abnormal, both pupils constrict when the light is shown into the right eye. When the light is swung to the left eye, both pupils **dilate**. When the light is swung back to the right eye both pupils again constrict.



Mncophthal.com

## Horner's Syndrome

Damage occurs to the sympathetic nerves that causes:

- \* Ptosis
- \* Miosis
- \* Anhidrosis
- \* *Enophthalmos (may or may not be present.. eyeball inset)*



hyperhidrosisindia.com

## Cocaine Test

Cocaine eye drops block the re-uptake of norepinephrine which results in the dilation of a **normal pupil** from retention of norepinephrine in the synapse. But in in Horner's syndrome, the lack of norepinephrine in the synaptic cleft causes **NO MYDRIASIS**.

Due to the difficulties, and concerns, with storing and having cocaine drops in the clinic, most doctors now will use Apraclonidine (IOPIDINE) drops to both eyes and observe the increased mydriatic effect (due to hypersensitivity) on the **affected side of Horner syndrome** (the **opposite** effect to what the cocaine test would produce in the presence of Horner's)



(drugs.com)

## Paredrine Test

This helps to **localize the cause of the miosis.**

### Localization of the Lesion

- First-order neuron (brainstem or cervical cord)
- Second-order neuron (chest or neck)
- Third-order neuron (above the superior cervical ganglion at the carotid bifurcation).

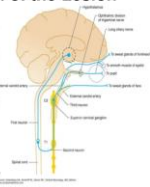


Table 21.1  
Most Common Causes of Horner Syndrome in Adults Based on Lesion Location

Central (1st Order)	Preganglionic (2nd Order)	Postganglionic (3rd Order)
• Stroke	• Central cord disease	• Sympathetic cervical ganglion
• Tumor	• Sympathetic chain lesion	• Tumor
		• Carotid artery aneurysm
		• Idiopathic
		• Trauma

Slideshare.com

Healio.com

## Chemical Testing For Horner



1. Cocaine 4%: both eyes. If the smaller pupil on ptotic side dilates poorly or not at all this indicates Horner, but does not tell which neuron.
2. Hydroxyamphetamine (Paradrine) 1%: both eyes. If pupils dilate - 1st or 2<sup>nd</sup> neuron. Pupil on involved side fails to dilate - 3<sup>rd</sup> neuron. In this case workup is indicated.

Cyber-sight.org

## Cycloplegia Versus Mydriasis and Angles

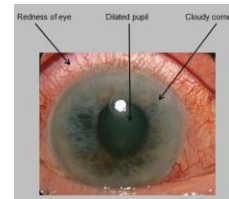
So you are working with your patient...and you are at the point to put in the dilating drops. You check their angles at the slit lamp and notice they are ?? shallow.

They are having flashes and floaters and the doctor wants them dilated. **WHICH** drop should you NOT use ?????



## NEOSYNEPHRINE

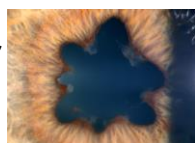
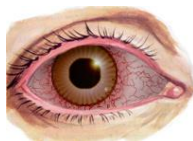
Neosynephrine eyedrops are used to **prolonge** the effect of the dilating mydriatic drops. IF the angle is narrow, and you use neosynephrine and a mydriatic, you will not be able to bring the pupil down quickly. IF you had just used a mydriatic, a drop of Pilocarpine would bring the pupil down. With Neo on board, you would need to use the laser to make another exit for the increased aqueous build up.



autospecinfo.com

## Recurring Iritis

Iritis is usually caused by trauma but can also be caused by non-traumatic causes. Some of these can be associated with certain diseases as well, such as **ankylosing spondylitis**, sarcoid, and **inflammatory bowel disease**. There also can be an infectious cause such as with Lyme disease, tuberculosis, toxoplasmosis, and the herpes viruses.

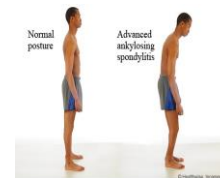


Ophthalphotography.com

## Questions to Ask - And To Who ?!

Ankylosing spondylitis usually effects young men under 30 y.o. and progresses over a 20+ year period before it finally stops progressing. Seventy five percent of men who suffer from ankylosing spondylitis also have intestinal inflammation.

In women 80% are thought to have intestinal disease problems (IBS, Crohn's Disease).



Ankylosing spondylitis is an inflammatory disease that can cause the vertebrae in the spine to fuse. The fusing makes the spine less flexible and can result in a hunched forward posture. If the ribs are involved, it can be difficult to breathe deeply. There is no cure. **Ankylosing spondylitis affects men more often than women**

Normal spine      Ankylosing spondylitis

Mediobank.com/Spine/1-2010/for/med/obank. All rights reserved. www.medbank.com

### Tests Your Doctor Will Ask For

The **HLA-B27** test is primarily ordered to help strengthen, or confirm, a suspected diagnosis of ankylosing spondylitis (AS), reactive arthritis, juvenile rheumatoid arthritis (JRA), or sometimes anterior uveitis.

The HLA-B27 test is **not** a definitive test but is one piece of evidence used along with the signs, symptoms, and other laboratory tests to support or rule out the diagnosis of certain autoimmune disorders.

(Labtestsonline.org)

ArthritisRelieved.com

### Recurring Erosion

Recurrent corneal erosion (RCE) syndrome is characterized by a disturbance of the basement membrane of the corneal epithelial. This causes adhesions and recurrent breakdowns of the epithelium. Frequently happens secondarily to a past corneal injury but can also be spontaneous. The hallmark is **pain**.

peterheyworth.com      eyesurgeryinberkshire.co.uk

Patients typically present with attacks of mild to severe eye pain, redness, tearing, and light sensitivity. **Most patients report severe pain upon awakening FROM sleep.** RES typically occurs in eyes that have suffered from a sharp, abrading injury (fingernail or paper cut). The area heals initially, but is prone to recurrent erosions in the future.

webvision.med.utah.edu      reviewofoptometry.com

### Something Is In My Eye

pinterest.com      medpic.org      reference.medscape.com

Patients with foreign body sensation can be very difficult to triage. The complaint can be caused by numerous reasons: actual foreign body, growths, infections, blepharitis debris falling into the eye and abusing (artificial tear overuse or vasoconstrictor drop overuse) can be a number of the reasons for this complaint.


Medscape.org



Ulcers are another reason patients have foreign body sensation. Corneal ulcers are most commonly caused by an infection with bacteria, viruses, fungi, or a parasite.

For example:


- Acanthamoeba happens in contact lens users- especially if patients make their own cleaning solutions.
- Fungal ulcers can occur after an injury involving plants or "living" materials.
- Herpes simplex keratitis is a viral infection caused by the chicken pox virus. It causes repeated attacks that are often triggered by stress or advanced illnesses.
- Trauma and the introduction of foreign body material to the inner layers of the eye.



theyeyepractice.com

### Blurry Vision, Fluctuating Vision and Vision Comes And Goes


Blurry vision can be defined as a loss of sharp vision. This can be a sudden or a gradual occurrence in one, or both, eyes. Blurry vision can be a symptom of a variety of mild to serious diseases, such as nearsightedness, incorrect refraction, normal aging (presbyopia or cataracts) or it can be caused by infection, inflammation, trauma, malignancy, or a number of other processes (such as diabetes, changes in birth control pills, and other medication side effects).



Pic2fly.com

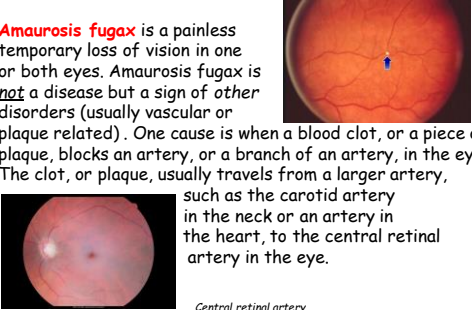
### Fluctuating Vision

Various Disease or condition processes can attribute to fluctuating vision. In particular: diabetes, dry eyes, hormone replacement or birth control pills, and cataracts. Diabetes causes fluctuations in the following manner: when the blood sugars are uncontrolled, such as during blood sugar spikes, the lens will actually swell, causing a change in your refractive status (usually causing you to become more nearsighted). When your levels are normal, the lens returns to its normal shape. This is why it is so important to keep your blood sugars in control.



### Vision Comes And Goes

**Amaurosis fugax** is a painless temporary loss of vision in one or both eyes. Amaurosis fugax is not a disease but a sign of other disorders (usually vascular or plaque related). One cause is when a blood clot, or a piece of plaque, blocks an artery, or a branch of an artery, in the eye. The clot, or plaque, usually travels from a larger artery, such as the carotid artery in the neck or an artery in the heart, to the central retinal artery in the eye.



Learnneurosurgery.com  
Retinagallery.com

### Eye Bulging Forward

**Exophthalmos** is the bulging of the eye anteriorly out of the orbit. Exophthalmos can be either bilateral (Graves disease) or unilateral (orbital tumor). Proptosis is Exophthalmous.

Other reasons:


- Graves disease
- Orbital tumors
- Retinoblastoma
- Cavernous fistula
- Lacrimal gland tumors
- Retrolubar bleeding



Eyeesurgeryinberkshire.com  
Lifeinthefastlane.com

### Optic Nerve Glioma


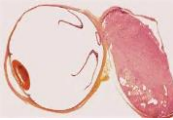
Optic nerve glioma is a type of brain tumor that affects the optic nerve, and is often one of the central nervous system manifestations of **neurofibromatosis**. Optic nerve glioma is a rare kind of cancer that's typically slow growing and found in children. It is rarely found in individuals over the age of 20 y.o.



Centerofbrainandspinesurgery.com  
Alhamediacenter.com

A low grade form of this neoplasm (neoplasia is an abnormal growth or division of cells that causes a lump or tumor. They can be benign, pre-malignant (carcinoma in situ) or malignant (cancer).

Occurs most often in pediatric patients. Another form, **aggressive glioma**, is most common in adults; it is frequently fatal, even with treatment. Many children with optic nerve glioma also have **neurofibromatosis**

Imgarcode.com

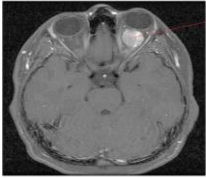
### Neurofibromatosis: von Recklinghausen Disease




Medstudents  
http://www.medstudents.com.br

### Orbital Tumors: Neurotumors

**Optic nerve glioma** is the most common primary neoplasm of the optic nerve. Along with reducing vision in the affected eye, the tumor sometimes produces additional symptoms as it grows. It is often a CNS manifestation of Neurofibromatosis. Optic gliomas are rare. The cause of optic gliomas is unknown. Most optic gliomas are slow-growing and noncancerous (benign) and occur in children, almost always before age 20.



pedsonologyeducation.com

### "My Childs Eye Looks Funny In Their Picture"




Probably the  
Phone call I  
Want to  
Triage the  
Least because  
There is  
Usually one  
Thing I  
Think of:  
Retinoblastoma



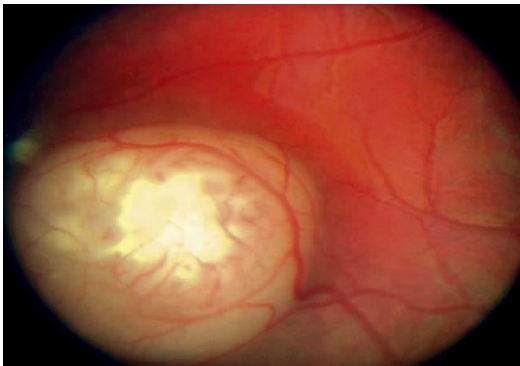
Pinatopin.com Imgarcode.com

### Retinoblastoma

**"Cat's eye reflex" (leukocoria)** can be caused by many conditions, but the most serious is retinoblastoma, a life-threatening intraocular tumor of early childhood.

Source: Cancer Control © 2006 H. Lee Moffitt Cancer Center and Research Institute, Inc.



eyetextbook.com

Rapidly developing cancer which develops in the cells of the retina.



In the developed world, Rb has one of the best cure rates of all childhood cancers (95-98%), with more than nine out of every ten sufferers surviving into adulthood. Retinoblastoma is a very treatable cancer

## Facts

- Most common eye tumor in children, and the third most common cancer overall affecting children
- \* It now occurs in 1 out of every 15,000 births. Two hundred fifty to 350 new cases are diagnosed each year in the US with over 90 percent of cases presenting before the age of 5 years.
- \* Untreated, retinoblastoma is almost always fatal; therefore, early diagnosis and treatment is critical in saving lives and preserving visual function.

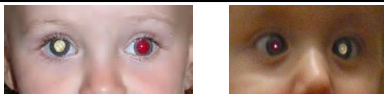


## Symptoms

The most common and obvious symptom is an abnormal **appearance of the pupil**. In a healthy eye, the pupil may appear red when captured on a photograph where a flash has been used (red eye), whereas on an affected eye, the pupil may appear white or yellow (**leukocoria**). The yellowy appearance may also be visible in low artificial light and will resemble a cat's eye



**In about 2/3rds of cases, only one eye is affected;** in the other 1/3, tumors develop in both eyes. The number and size of tumors on each eye may vary. The position, size and quantity of tumors are considered when choosing the type of treatment for the disease.



There are two forms of the disease, a heritable form and non-heritable form (all cancers are considered genetic in that mutations of the genome are required for their development, but this does not imply that they are heritable, or transmitted to offspring). Approximately 55% of children with retinoblastoma have the non-heritable form.

Some children with retinoblastoma can develop a squint or strabismus.



Most patients with unilateral disease present with advanced intraocular disease and therefore usually undergo enucleation, which results in a cure rate of 95%.

Not every child with strabismus has a tumor- but they need a dilated eye exam to ensure they don't!



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