

# WHY WE DO THE THINGS WE DO

Primary Care Principles for the Technician

Ashley S. Reddell, OD, FCOVD


1


## DISCLAIMER


I have no financial interest in any company or product I may mention during this presentation.


2


## About Me

 Born & Raised in Kansas

 Graduated from KU -- Rock Chalk!


 Graduated from Southern College of Optometry


 Completed Residency in Pediatrics & Vision Rehab


 Own private practices with my husband in Leavenworth and KC metro


3

## Course Objectives

 Understand how the technician's data shapes the exam

 Understand how the visual system relates to systemic health

 Understand what info the doctor gains from each preliminary test & how it influences diagnosis

 Learn the systemic diseases that manifest in the eye (especially those that can show up in the eye first!)

4

## The Trickle-Down Effect

- Each data point affects the doctor's differential diagnosis process
- Examples:
  - Red Eye
  - Rx Check

5

## Color Vision Testing

- Why monocularly?
- Issues that affect the optic nerve's conduction to the brain can result in color vision deficits
  - Multiple Sclerosis (MS)
  - Toxic or Nutritional Optic Neuropathy
  - Advanced glaucoma

6

## Visual Acuity

- Accuracy is critical
- When and how the pinhole occluder is used
- Systemic issues with reduced acuities:
  - Diabetes Mellitus
  - Hypertension (HTN)
  - Brain lesion/Ischemia
  - Grave's Ophthalmopathy
  - Albinism
  - Sickle Cell



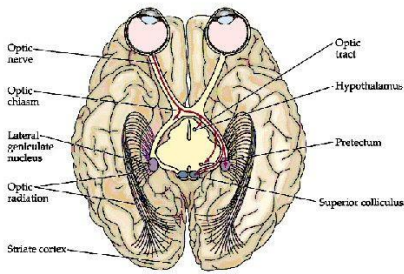
7

## Visual Field Screener

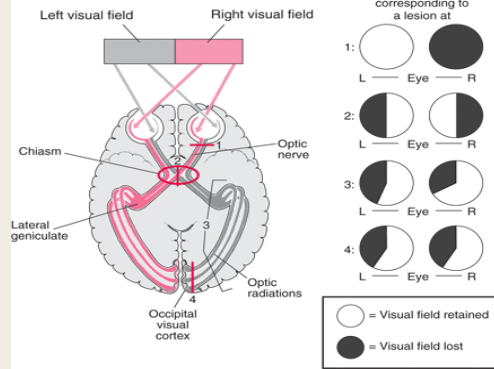
- Window to Neurology
- Systemic issues with visual field defects:
  - Brain Lesions (i.e. pituitary adenomas)
  - Multiple Sclerosis
  - Temporal Arteritis
  - Cerebral Vascular Accident
  - Grave's Ophthalmopathy
  - Pseudotumor Cerebri

8

## Central Visual Pathways



9



10

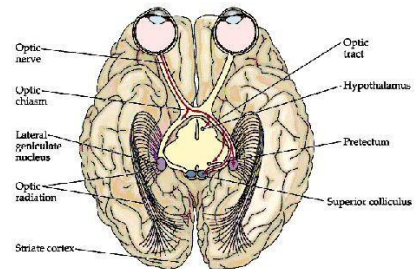
## Pupil Testing

- Window to Neurology
- Systemic issues with pupil abnormalities
  - Multiple Sclerosis
  - Brain Lesion
  - Cerebral Vascular Accident
  - Temporal Arteritis
  - Trauma



11

## Central Visual Pathways



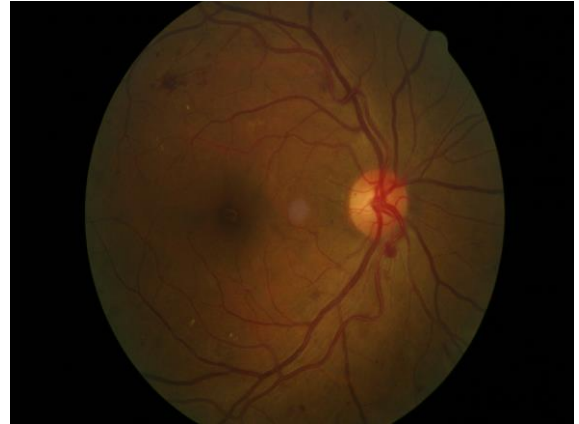
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## Overview of Systemic Issues

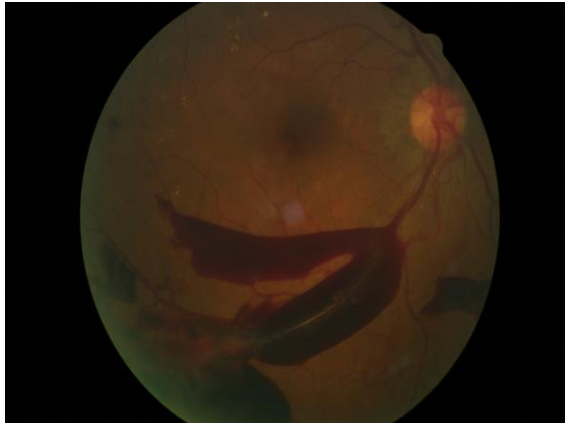
### ■ Diabetes Mellitus

- Metabolic disorder characterized by elevated blood glucose.
- Individuals with DM are **25 times** more likely to become legally blind than those without DM.
- Vision reduced related to deficiencies in the blood-retinal barrier.
  - Hemorrhages, microaneurysms, cotton wool spots, neovascularization, macular edema

13

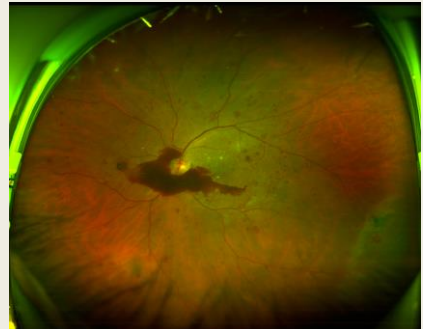


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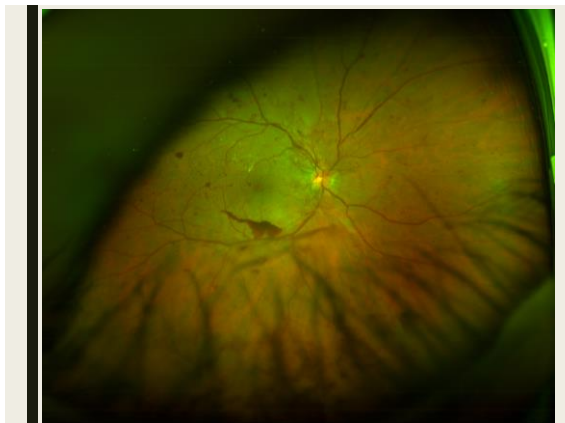


15

## Failed Driver's License Test...



16



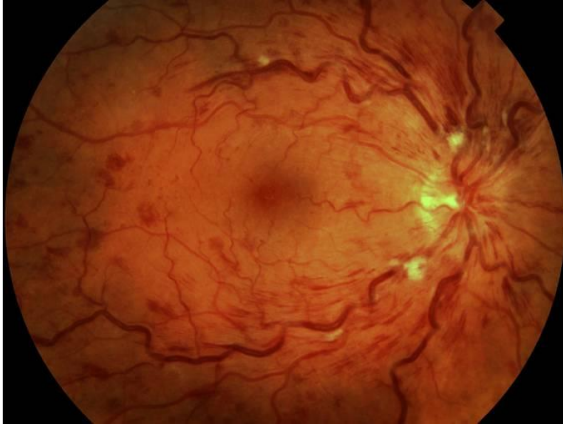
17

## Overview of Systemic Issues

### ■ Hypertension

- 1/3 of all cases go undetected because of asymptomatic nature (MU)
- Blood pressure is the force of blood that is pushing up against the walls of the blood vessels.
  - If the pressure is too high, the heart has to work harder to pump, this could lead to organ damage
- Effects on the Retina
  - Vessel narrowing, microaneurysms, hemorrhages, cotton wool spots, papilledema

18



19

## Overview of Systemic Issues

- Multiple Sclerosis
  - Affects the ability of the nervous systems to send signals causing numbness, tingling, limb weakness, diplopia, and blurred vision
  - 20% of cases have optic neuritis as initial presentation
  - Effects on the Visual System
    - Abnormal color vision, blurred vision, visual field defect, pupil abnormalities, pain w/ eye movement, diplopia

20



21



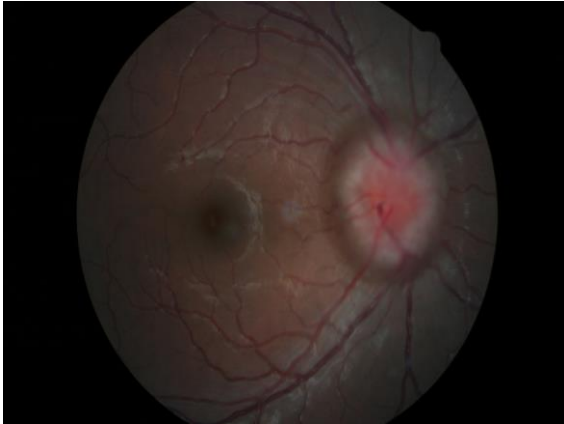
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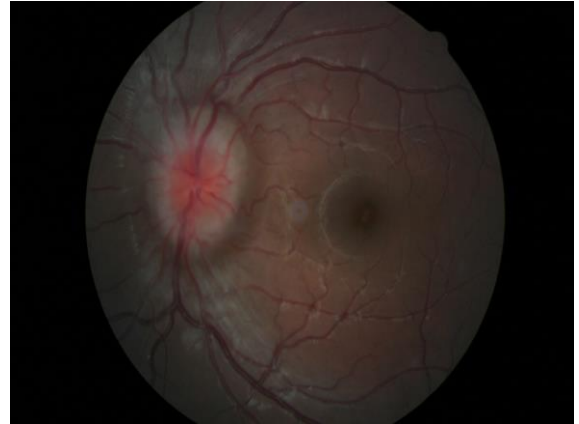
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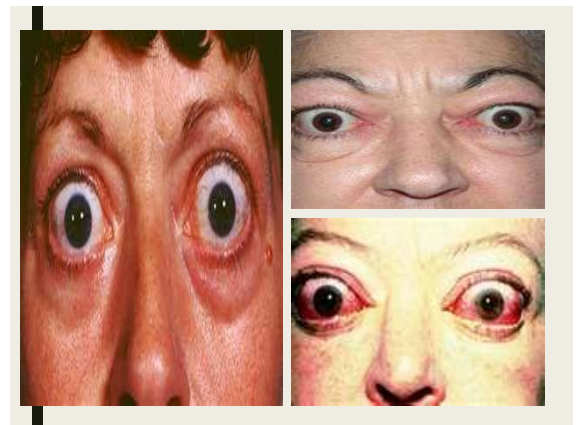


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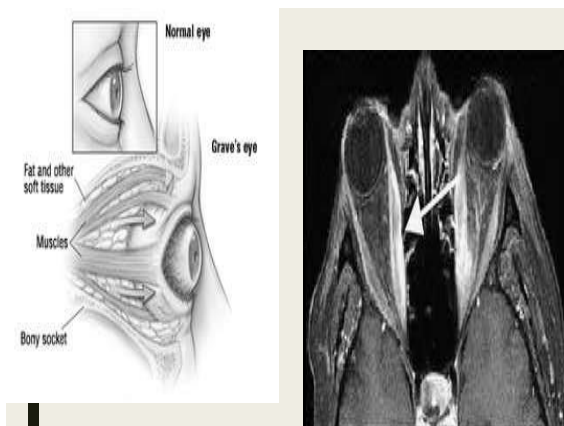
## Overview of Systemic Issues

- **Grave's Disease**
  - Triad of hyperthyroidism, toxic diffuse goiter, and ophthalmopathy
  - Thyroid is overproducing causing insomnia, hyperactivity, hair loss, sweating, heat intolerance, weight loss, palpitations, and muscle weakness.
  - Effects on the visual system related to "bulging eyes"
    - Exposure keratoconjunctivitis, double vision, muscle restriction, lid retraction, color vision, visual field loss

27



28



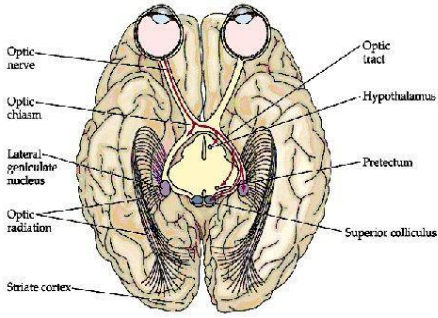
29

## Overview of Systemic Issues

- **Cerebral Vascular Accident**
  - Due to reduction in cerebral circulation causing neurological deficits persisting at least 24 hours.
  - Transient Ischemic Attack (TIA) is a predisposing factor for stroke (1/3 untreated experience stroke within 1 year).
    - Causes transient loss of vision (seconds to minutes)
    - Retinal exam to evaluate presence of Hollenhorst plaque
    - CVA can cause diplopia, field loss, pupil abnormalities, color vision deficits

30

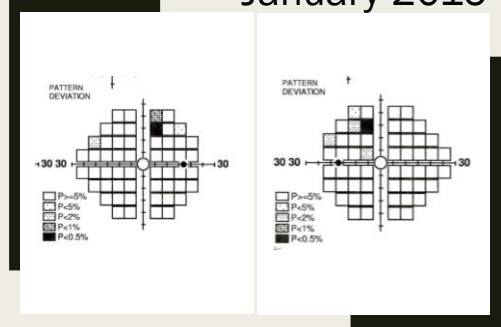
# Central Visual Pathways



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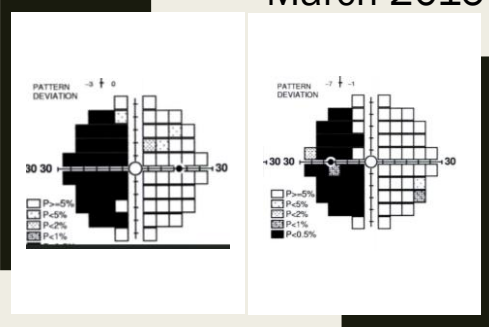
31

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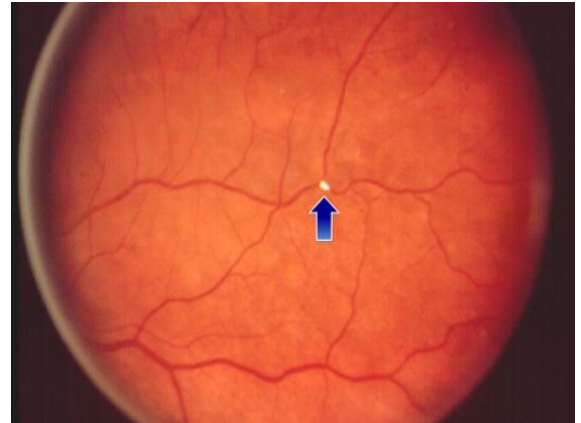


32

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33



34



## QUESTIONS?

[areddell@FEClv.com](mailto:areddell@FEClv.com)

35