

 **CASEY EYE**
Institute
OHSU

Neuro-Ophthalmology Basics: From Exam to Diagnosis

OAO 2026 Eye Technician Meeting

DATE: FEBRUARY 27, 2026 PRESENTED BY: FLORIAN GUILLOT, MD (PGY1)

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Disclosures

None.

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Learning Objectives

1. Describe the diagnostic tools and tests used in evaluating neuro-ophthalmic conditions.
2. Understand the neurological basis for routine exam maneuvers.
3. Recognize technician responsibilities and red flags that warrant urgent attention.

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Why Does This Matter?



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The Neuro-Op Toolkit

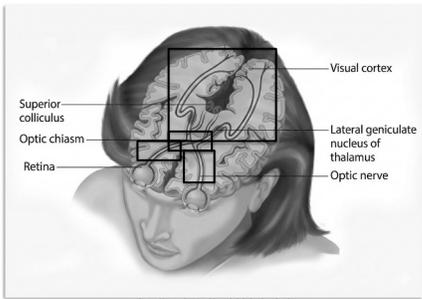
- Pupils
- Extra-ocular movements
- Color vision
- Visual fields

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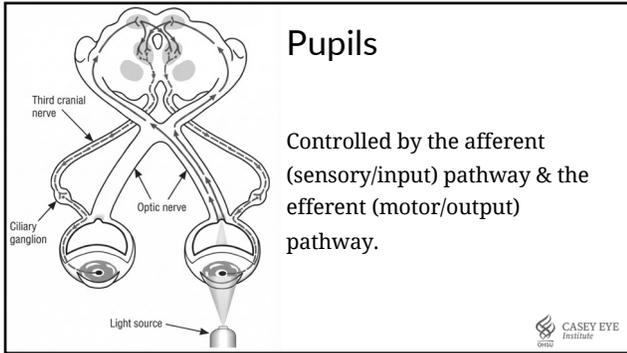
Anatomy



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TARGET
Focus on distant target.

DIM LIGHTS
Dim lights.

SHINE LIGHT FROM BELOW
Shine light from below.
If asymmetric, assess in light & dark.

SYMPATHETIC STIMULATION
E.g., Stimulants, decongestants, antihistamines, dilating drops, midbrain injury/lesion.

PARASYMPATHETIC STIMULATION
E.g., Opioids, pontine injury.

DILATED PUPIL (WORSE IN LIGHT)
E.g., CNIII palsy, Adie's pupil.

CONSTRICTED PUPIL (WORSE IN DARK)
E.g., Horner's syndrome.

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TARGET
Focus on distant target.

DIM LIGHTS
Dim lights.

SHINE LIGHT FROM BELOW
Shine light from below.
If asymmetric, assess in light & dark.

SHINE LIGHT IN EACH EYE
Shine light in each eye to assess individual response.

TEST FOR RAPD
Test for Relative Afferent Pupillary Defect (RAPD) with the swinging flashlight test.

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Test for Relative Afferent Pupillary Defect (RAPD) with the swinging flashlight test.

RAPD CHECK: 1-2 sec

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Extraocular Movements

- Assess primary gaze
 - Hirschberg (corneal light reflex) test

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Alignment Assessment (Hirschberg)

	Normal corneal reflex	
	Esotropia (eye turned inward)	
	Exotropia (eye turned outward)	
	Hypertropia (eye turned upward)	
	Hypotropia (eye turned downward)	

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Extraocular Movements

- Assess primary gaze
- H-pattern

Grading:

- 0 = Full movement
- 1 = 25% deficit
- 2 = 50% deficit
- 3 = 75% deficit
- 4 = No movement past midline

Miriam CURIE Utah

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DO NOT DILATE! Concerns for aneurysm/stroke!

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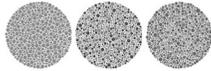
Fluctuating motility/ptosis

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Color Vision

- Test each eye individually
- Color plates:
 - Ishihara



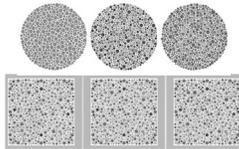
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Color Vision

- Test each eye individually
- Color plates:
 - Ishihara
 - Hardy-Rand-Rittler



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Visual Fields

- Confrontational fields



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Automated Visual Fields

- Humphrey Visual Fields
 - Maintain constantly fixed gaze
 - Refractive + presbyopic correction with test lens
 - Each eye tested separately (3-5 min each)



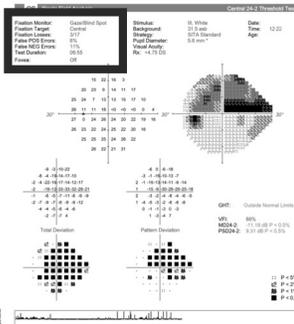
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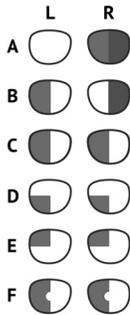
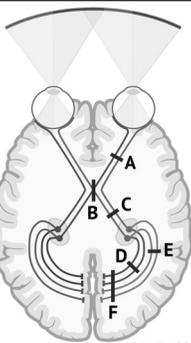
VF Quality

- Reliability indices
 - Fixation losses, <20%
 - False positives, <33%
 - False negatives, <33%
- Also consider:
 - Testing area (24-2 vs 10-2)
 - Test duration, < 10 min
 - Stimulus characteristics: size 3 white stimulus



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The Neuro-Op Toolkit

- Pupils: Optic neuropathy, CN III palsy, Horner syndrome, aneurysm
- Extra-ocular movements: Cranial nerve palsies, myasthenia gravis, stroke
- Color vision: Early optic neuritis, optic neuropathy
- Visual fields: Glaucoma, stroke, chiasmal lesions, functional vision loss

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Conclusion

- Always record pupil shape, reaction, RAPD before dilation.
- Motility deficits, ptosis can indicate intracranial disease. Check with physicians before dilating!
- Color testing can indicate optic nerve disease
- Visual fields help establish and track diseases affecting peripheral vision

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Thank You

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