




OHSU

Two Is Not Always Better Than One

A Guide to Diplopia

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Learning Objectives

- Differentiate between monocular and binocular diplopia
- Identify common causes of double vision
- Understand basic prism physics

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What is diplopia?



- Double vision, seeing two of the same objects simultaneously



- Binocular diplopia vs monocular - how to differentiate?

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Monocular vs Binocular?

- Take turns covering each eye!

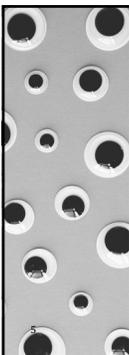


- Binocular diplopia – double vision resolves by covering either eye
- Monocular diplopia - double vision resolves when the affected eye is covered

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Monocular Diplopia

- Diagnostic Clue: double vision persists with one eye closed
- Common causes:
 - Refractive error
 - Cornea (Dry Eyes)
 - Lens (Cataracts)
 - Retina (AMD, ERM)
- Treatment: PFATS, glasses, contact lenses, surgical intervention of affected eye
- I.e. not a neuro-ophthalmology/strabismus problem!

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Binocular Diplopia

- Diagnostic Clue: Double vision only occurs when both eyes open
- Common causes:
 - Supranuclear
 - Parkinson's, Progressive Supranuclear Palsy
 - Nuclear
 - Oculomotor, trochlear, abducens
 - Infranuclear
 - CN lesions in the cavernous sinus, muscular and neuromuscular junction
- Treatment: varies depending on cause

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CC: "I'm seeing double."

- How do you begin to approach this patient?

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CC: "I'm seeing double."

- History is KEY!
 - Monocular vs binocular
 - Direction
 - Duration
 - Location
 - Associated symptoms
 - History of eye turn or abnormal head position

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Exam Tools and Techniques

- Sensory
 - A
 - B
 - C
- Motor
 - EOM
 - Cover testing or Maddox rod




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Maddox Rods

- Series of cylinders in a (usually red) lens
- Takes point source and makes it appear like a line that is perpendicular to the direction of the cylinders (i.e. if cylinders vertical, the line will appear horizontal)
- Remember that images are flipped + upside-down in the retina



Left Hyper



Right Hyper



No Vertical



EXO



ESO



ORTHO



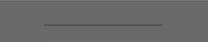
You have to make sure which eye Maddox Rod is placed over. If reversed, the slides does not hold true anymore. The above is for Maddox over OD.
 You have to make sure which eye Maddox Rod is placed over. If reversed, the slides does not hold true anymore. The above is for Maddox over OD

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Double Maddox Rods

- For torsion
- Red and white lens



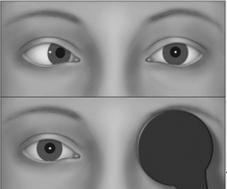





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Cover-Uncover Testing

- Tropia: **manifest** eye misalignment that is present all the time
- Phoria: **latent** eye misalignment that becomes apparent only during certain situations





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Alternate Cover Testing

- Using a prism over one eye can quantify the misalignment

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Prisms

- Prism: object used to deviate direction of light
- One prism diopter: deviation of 1 cm at a distance of 1 m from a prism.

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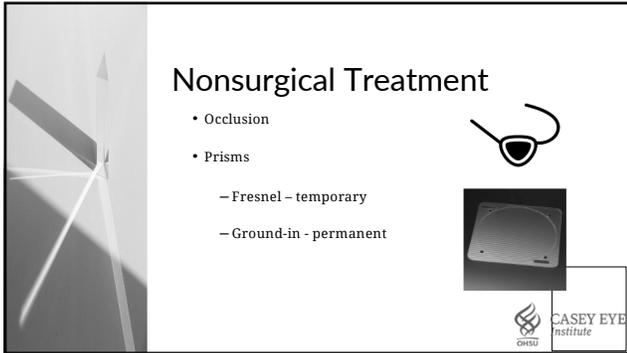
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Prisms

- Goal: binocular vision in primary gaze
- Orientation: Apex (point) in direction where eye is (or base is direction you want eye to go)
 - i.e. For exotropia: base in prism to correct
- Image goes towards apex

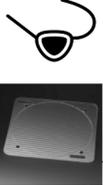
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Nonsurgical Treatment

- Occlusion
- Prisms
 - Fresnel – temporary
 - Ground-in – permanent




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When is diplopia an emergency?

- Anytime you suspect GCA
- Acute 3rd nerve palsy
 - Esp. pupil-involving



Right eye: Downward and outward gaze, dilated pupil, eyelid manually elevated due to ptosis

Left: Normal



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Thank You




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