



Vestibulo-ocular Reflex Eye Movements

Vision Clinical Pearls Series No. 3

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Types of Eye Movements

- There are four basic types of eye movements:
- **Smooth pursuit movements** are much slower tracking movements of the eyes designed to keep a moving stimulus on the **fovea**
- **Saccades** rapid, ballistic movements of the eyes that abruptly change the point of fixation.
- **Vergence movements** align the fovea of each eye with targets located at different distances from the observer.
- **Vestibulo-ocular movements** stabilize the eyes relative to the external world, thus compensating for head movements.

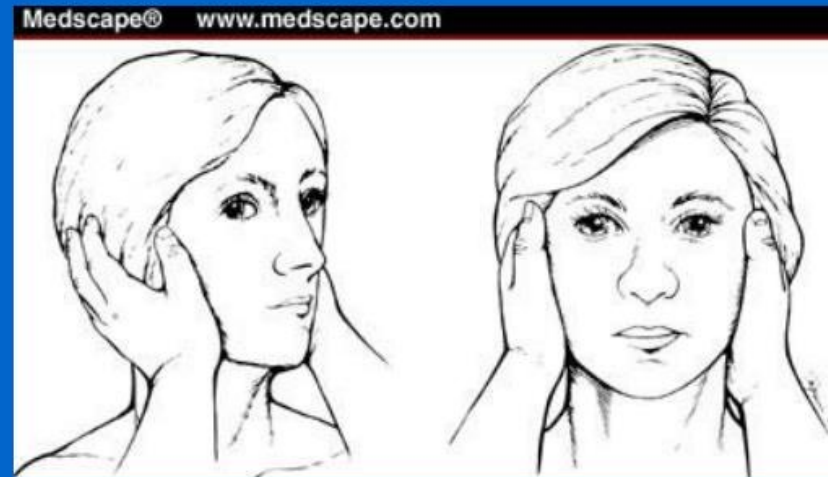


What is
Vestibulo-ocular
reflex?

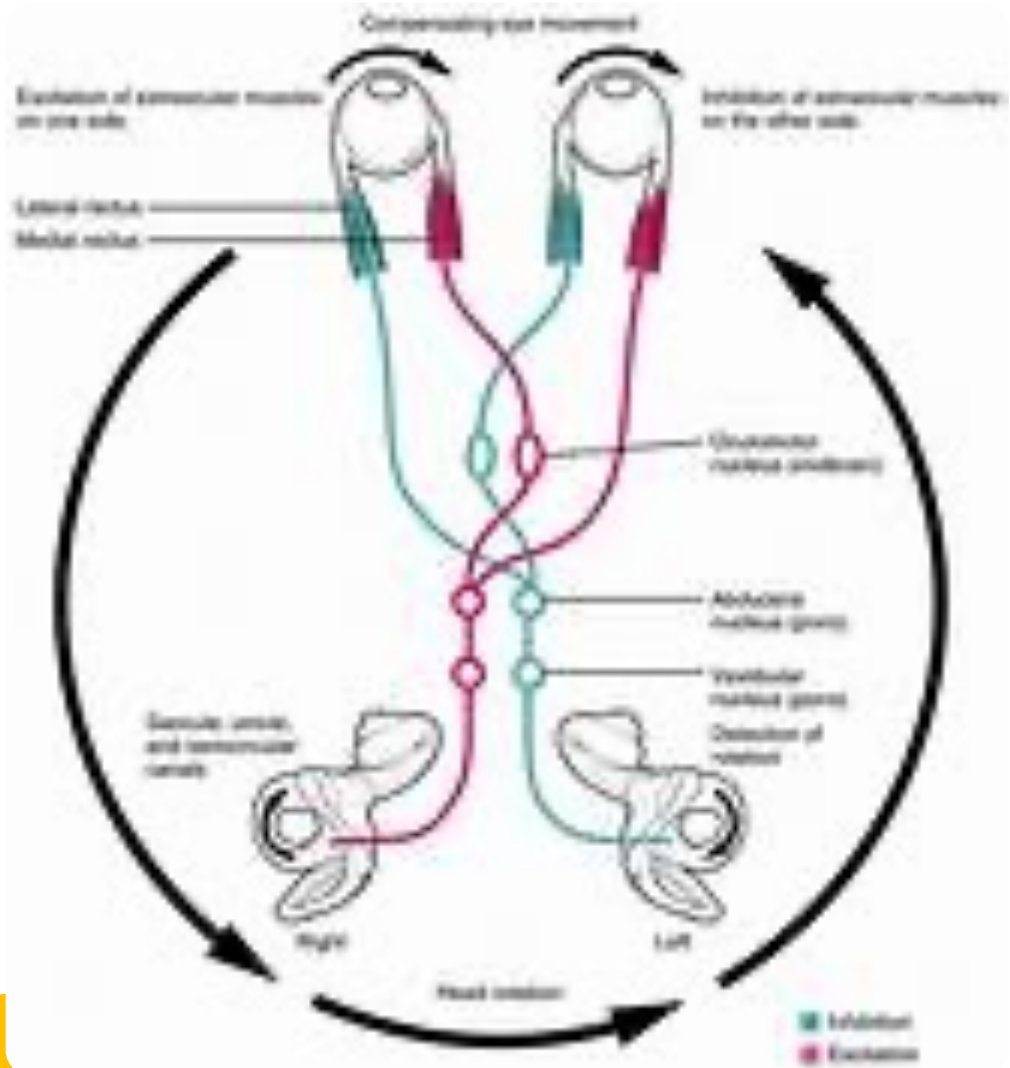
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Test of vestibulo-ocular reflex

- Nystagmus
- Head Shake
- Head thrust



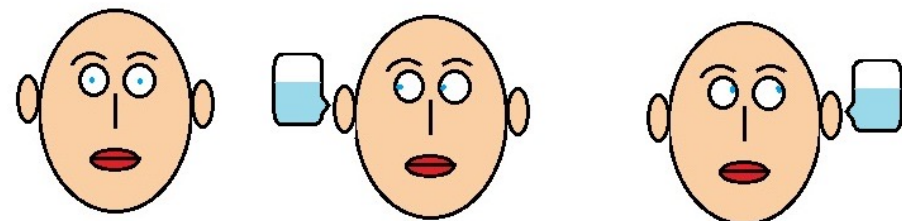
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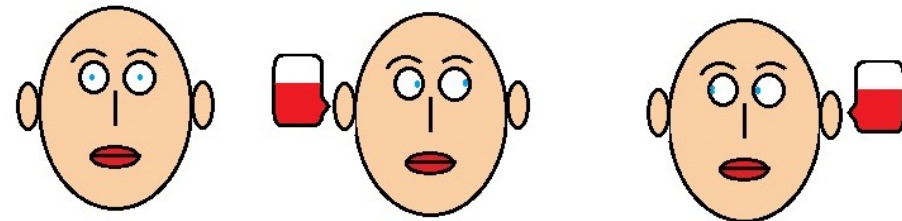
Vestibulo-ocular Reflex

Vestibulo-ocular Reflex

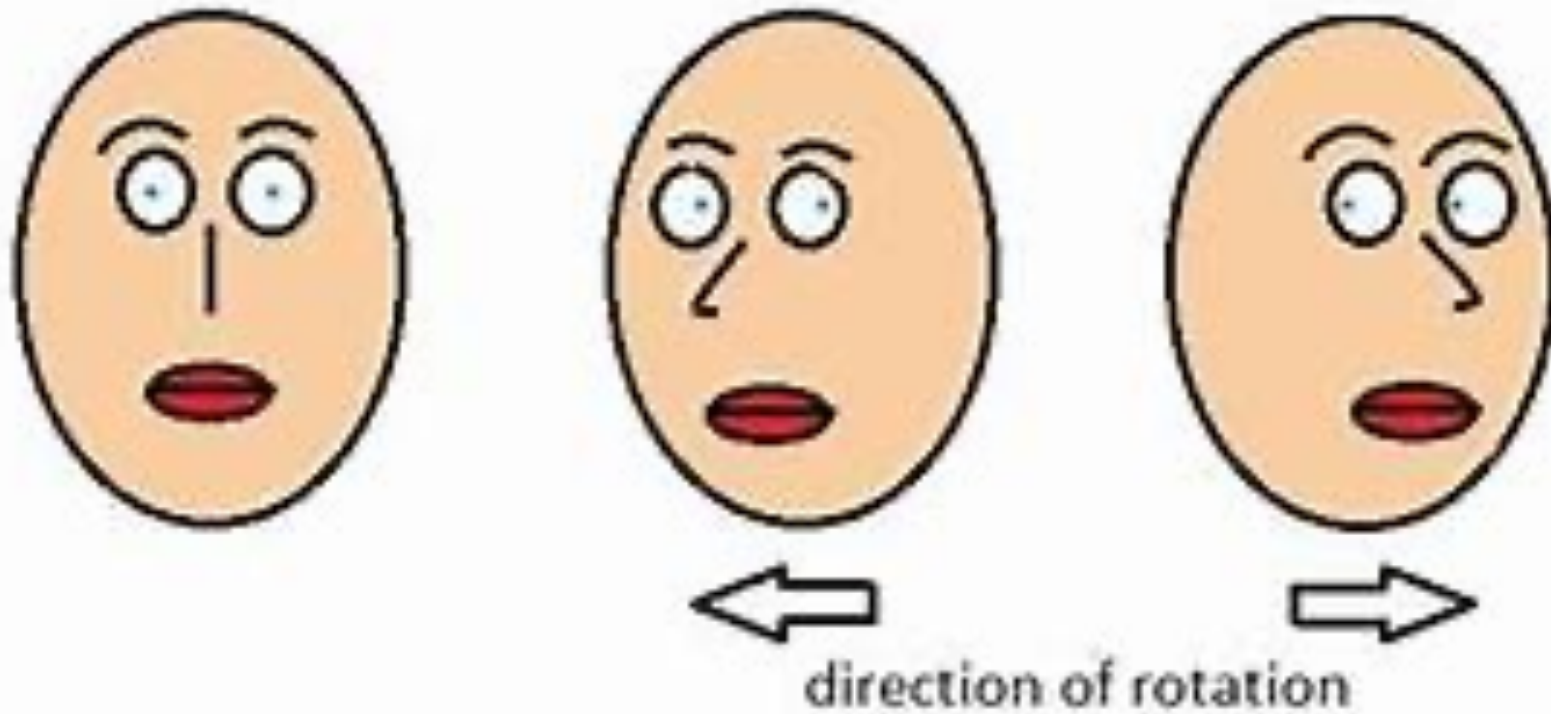
Cold water:



Warm water:



Positive Oculo-cephalic Reflex



Vestibulo-Ocular Reflex





Type of eye movement	Function	Stimulus	Clinical tests
Vestibular	Maintain steady fixation during head rotation	Head rotation	Fixate on object while moving head; calorics
Saccades	Rapid refixation to eccentric stimuli	Eccentric retinal image	Voluntary movement between two objects; fast phases of OKN or of vestibular nystagmus
Smooth pursuit	Keep moving object on fovea	Retinal image slip	Voluntarily follow a moving target; OKN slow phases
Vergence	Disconjugate, slow movement to maintain binocular vision	Binasal or bitemporal disparity; retinal blur motion	Fusional amplitudes; near point of convergence

OKN = optokinetic nystagmus.

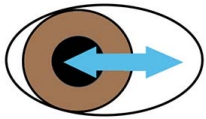
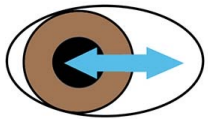
Introduction:

Nystagmus is a vision related issue in which one or both the eyes start moving rapidly either in up to down, side to side or circular position. Some other names given to this eye condition are dancing eyes and uncontrolled eye movements.



Supranuclear Eye Movement and Nystagmus

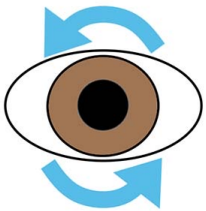
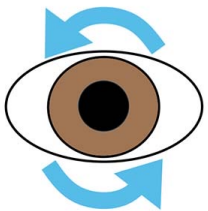
Types of nystagmus



Horizontal
(side to side)



Vertical
(up and down)



Pendular
(round in circles)

Nystagmus COMMON WARNING SIGNS



Uncontrollable
eye
movement



Nighttime
vision
problems



Shaky or
blurry vision



Balance
problems



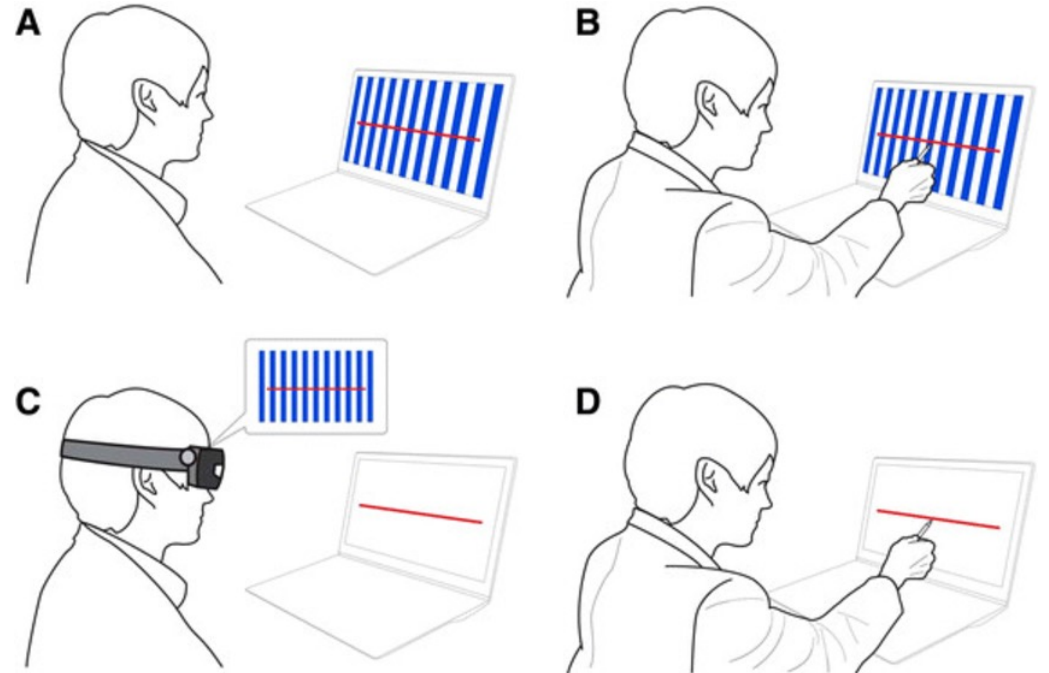
Light
sensitivity



Dizziness

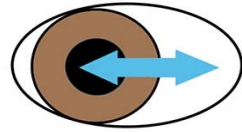
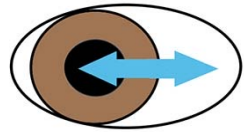
Vestibular
Testing - Optokinetic Nystagmus

Striped Drum Method

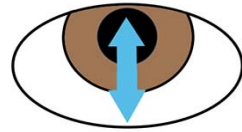
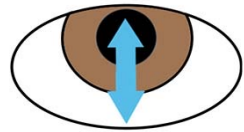


Vestibular Testing

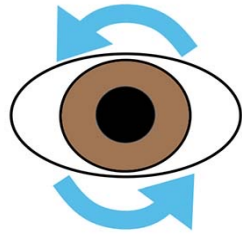
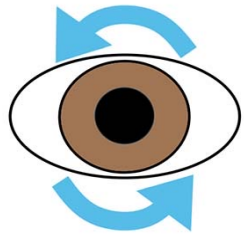
Types of nystagmus



**Horizontal
(side to side)**

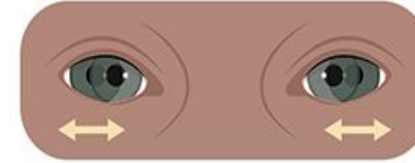


**Vertical
(up and down)**

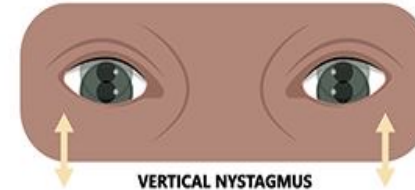


**Pendular
(round in circles)**

NYSTAGMUS



HORIZONTAL NYSTAGMUS



VERTICAL NYSTAGMUS

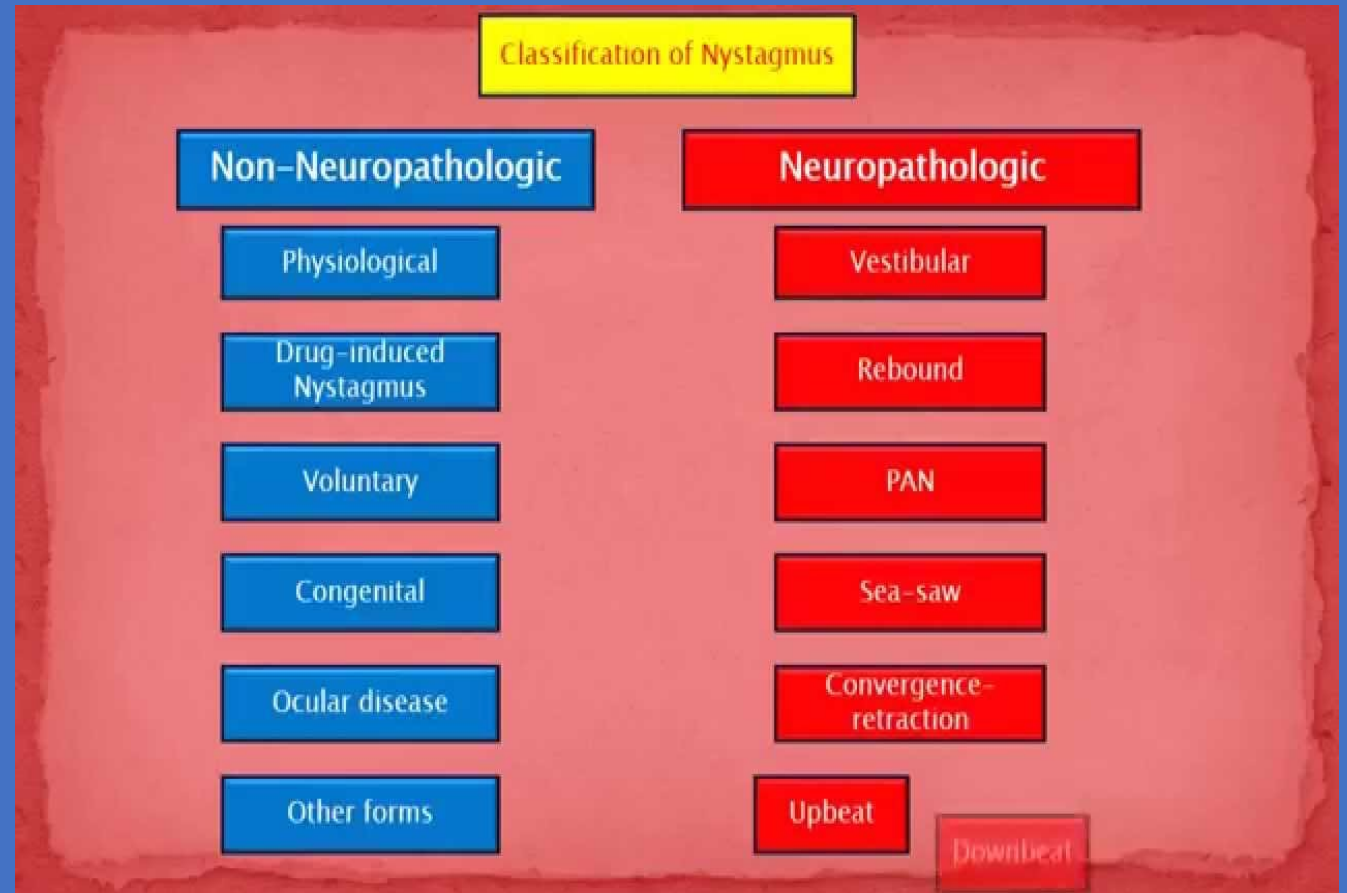


TORSIONAL (ROTARY) NYSTAGMUS

Types of Nystagmus

Optokinetic test

- Repeated tracking of moving target, producing nystagmatic motion.
- Disorders:
 - asymmetry
CNS lesion
difference of 30 degs or more, at more than one stim rate.
 - flat or declining response to faster rates. brainstem lesion, possible MS
 - inverted movement
congenital nystagmus



Clinical Evaluation



Optokinetic Nystagmus (OKN)

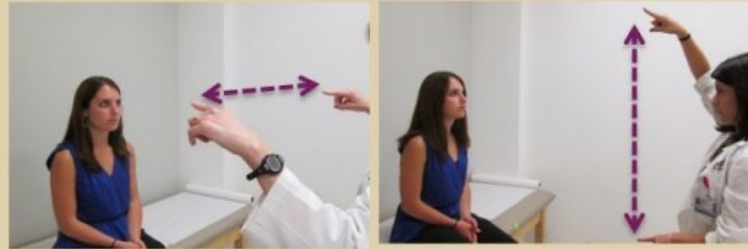
- A physiological involuntary reflex
- Elicited by moving a striped tape or drum in front of the patient
- A slow phase in the direction of movement of tape or drum & a corrective fast phase in the opposite direction



Identifying Vestibular and Ocular Problems after Concussion: UPMC VOMS



Horizontal & Vertical Pursuits



Horizontal & Vertical Saccades



Near Point Convergence



Horizontal & Vertical VOR



Visual Motion Sensitivity

- A brief 5 minute **clinical screening** tool to identify additional vestibular and ocular motor impairment and symptoms following concussion
- Used in conjunction with symptom reporting, neurocognitive assessment, balance testing, cervical and exertion screening in order to provide more complete clinical picture

Case with Alternating Exotropia



Pupil reflex 4 mm nasally = 28-32 degrees of exotropia
deviation estimated to be 56-64 prism base IN

Dr. Teresita Reyes Yambot

OPTOMETRIST IN VISION DEVELOPMENT

VISION CARE RESEARCH AND TRAINING INSTITUTE
Dr. Fe Del Mundo Medical Center Foundation Phils, Inc.
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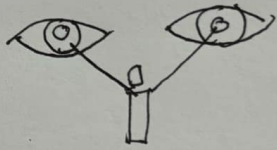
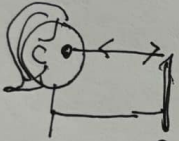
Clinic Hours:
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Tuesday, Thursday and Saturday

Clinic Hours:
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Tuesday, Thursday and Saturday

FOR APPOINTMENT, CALL/TEXT: Tel. (+63 2) 359-2216 • Cel. (Sun) +63943-293-1664

Patient: Baine G Pamahdanah Date: Aug 3, 2024
Address: _____

Rx 1) Pin to Nose Exercise

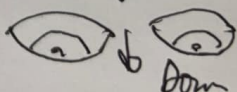
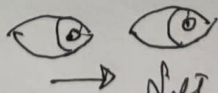
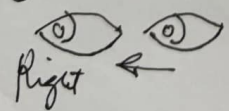
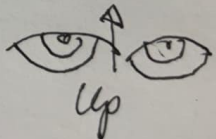


3) Alternate Occlude



Fixate at
object at near

3) Pursuit of movement



Me Subj r

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- HOME THERAPY
- DAILY EYE EXERCISES

Progress on
the
alternating
exotropia
case





Focus at near to read



Case with Alternating Exotropia





Best
Thank You
Messages

