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The Evaluation and Treatment of Dizziness in Mild TBI

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Objectives

Review incidence and Anatomy of Dizziness in mTBI

Differential diagnosis of Dizziness in mTBI

Evaluation

Treatment

No Financial Disclosures

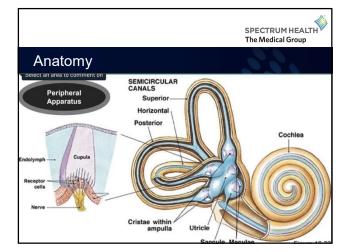
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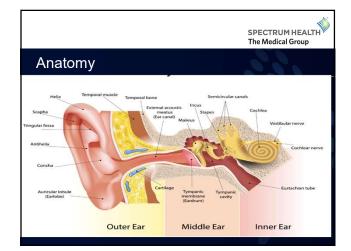
Incidence of Dizziness and mTBI

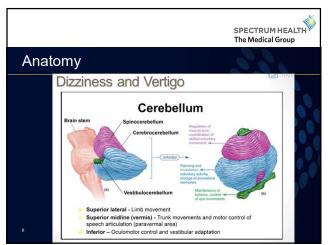
mTBI

- 5% of the US population per yr (16 million), likely higher number as many not reported
- mTBI is loss of consciousness 30 mins-1 hour
- 25-39% of mTBI pts reported dizziness within the 1st year after injury
- "post-concussive" symptoms
- 20% of patients with mTBI do not return to work, often due to debilitating symptoms including dizziness

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Vestibular system

What does the vestibular system do?
Linear and angular accelerometer
Senses rotational/angular movements of the head via the Semicircular Canals
Senses linear movements of the head via Utricle (horizontal) and Saccule (vertical)
Senses head position in space

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Differential Diagnosis	
CENTRAL Diffuse Axonal Injury (Microstructural Brain Injury) Post-Traumatic Vestibular Migraine	
Psychological/ PTSD/Post concussive syndrome Low CSF Pressure	
Brain Tumor CVA Multiple Selercein	
Multiple Sclerosis	

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Differential Diagnosis	
PERIPHERAL	Posttraumatic
Labyrinth Disorders	Meniere's Disease
BPPV	(excess Endolymph inner ear)
Exertional Dizziness	
Labyrinthine Concussion	
Vestibular Disorders	
Peri lymphatic Fistula	
Superior Semicircular Canal Dehi	scence
Temporal Bone Fracture	
¹¹ Otolith Disorders	



Evaluation – Dizziness Questionnaire

I. When you are "dizzy" do you experience any of the following symptoms

- 1. Light-headedness or swimming sensation in the head?
- 2. Blacking out or loss of consciousness?
- 3. Tendency to fall? to the left? to the right? forward? backward?
- 4. Objects spinning or turning around you? 5. Sensation that you are spinning or turning
- 6. Loss of balance while walking? veering to the left? veering to the right?
- 7. Headache?
- 8. Nausea or vomiting?
- 9. Pressure in the head?
- 10. Tingling in your fingers, toes or around your mouth?

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Evaluation – Dizziness Questionnaire

- My dizziness is: Constant? In attacks or episodes? When did the dizziness first occur?
- If in attacks: How often do attacks occur
- How long do they last? When was the first episode?
- What was the duration of the shortest attack?
- What was the duration of the shortest attach?
 Do you have any warning that it is going to occur?
 Do they occur at any particular time of day or night?
 Are you completely free of dizziness between attacks?
 Does change of position make you dizzy?

- 11. Do you have trouble walking in the dark?
- 12. When you are dizzy, must you support yourself when standing?
- Do you know any possible cause of your dizziness?
 Do you know of anything that will: Stop your dizziness or make it better? Make your dizziness worse? Precipitate an attack? (e.g.: fatigue, exertion, hunger, menstrual period, stress, emotional upset, alcohol) Were you exposed to any irritating fumes, paints, etc. at the onset of dizziness?

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"Million Dollar Clues"

Dizzy after rolling in bed = BPPV

Most common etiology, 9% of pts>65 seeing Doctor for other issues

Very light sensitive during dizzy spells or Difficulty in visually-stimulating surroundings = Migraine associated Dizziness

One ear feels like it's going to explode and/or roaring tinnitus = Meniere's (Endolymph. Hydrops)

Triggered by Salt, caffeine, dehydration and emotional stress

Sounds make my vision jump or blur = Semicircular Canal Dehiscence (SSCD)

	Dizziness Handicap Inve	ntory	The Med		EALTH ^W oup
Instru becau	ctions: The purpose of this scale is to identify difficultie use of your dizziness. Please check "always", <u>or</u> "no" <u>or</u> er each question only as it pertains to your dizziness pr Questions	s that you sometim	may be experier		
P1	Does looking up increase your problem?	Aiways	Sometimes	NO	
E2	Because of your problem, do you feel frustrated?		<u> </u>		
F3	Because of your problem, do you restrict your travel for business or pleasure?				
P4	Does walking down the aisle of a supermarket increase your problem?				
F5	Because of your problem, do you have difficulty getting into or out of bed?				
F6	Does your problem significantly restrict your participation in social activities, such as going out to dinner, going to movies, dancing or to parties?				
F7	Because of your problem, do you have difficulty reading?				
F8	Does performing more ambitious activities like sports, dancing, and household chores, such as sweeping or putting dishes away; increase your problem?				
E9	Because of your problem, are you afraid to leave your home without having someone accompany you?				
E10	Because of your problem, have you been embarrassed in				

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Γ	Dizziness Handicap Inventory						
P11 F12 P13							
F14							
E15	that you are intoxicated?						
F16	Because of your problem, is it difficult for you to go for a walk by yourself?						
P17							
E18	Because of your problem, is it difficult for you to concentrate?						
F19	Because of your problem, is it difficult for you to walk around your house in the dark?						
17			20				

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E20	Because of your problem, are you afraid to stay home alone?			
E21	Because of your problem, do you feel handicapped?			
E22	Has your problem placed stress on your relationship with members of your family or friends?			
E23	Because of your problem, are you depressed?			
F24	Does your problem interfere with your job or household responsibilities?			
P25	Does bending over increase your problem?			
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Can use subscale scores to track change as well





Office Evaluation Tests

abnorm mvmts

Dix-Hallpike – Nystagmus in BPPV, sustained Central

Spontaneous Nystagmus - Central more with fixation, peripheral jerky, more with Frenzel goggles for no fixation

Gaze Nystagmus – Central Jerky, to direction of gaze, downbeat

Smooth Pursuit (60 degrees to each side)- Central not smooth, saccadic, marching

Saccades (alt gaze between fingers) - Over/undershoot, slow or late

Vestibulo-Ocul Motor Test (Focus on written material while

moving head) – Sxs of any type = dysfunction

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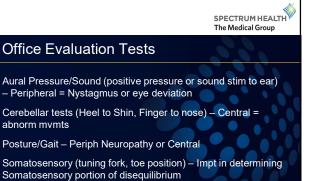
Office Evaluation Tests

Vergence – Central with a break, slow recovery

Head Shake (shake head 2HZ horizontal and vertical 20 secs eyes closed, then open with Frenzel) - Peripheral with nystagmus usually towards intact side

Dynamic Visual Acuity (read eye chart head still and then with Head Shake 0.2Hz) – Peripheral = >3 line drop in acuity

Fixation Suppression (Pt fixates on thumb while rotate body in chair) – Central = Nystagmus towards rotation



and

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Vestibular/Ocular Motor Screening (VOMS)						
	NT	Headache 0-10	Dizziness 0-10	Nausea 0-10	Fogginess 0-10	Comments
Baseline Symptoms	N/A					0 0 0
Smooth Pursuit						•
Saccades Horizontal						
Saccades Vertical						
Convergence (Near Point)					O	(Near Point in cm) 1. 2. 3.
VOR Horizontal						
VOR Vertical						
Visual Motion Sensitivity Test						

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Diagnostic Testing			
MRI/HCT			
Blood Tests			
Ultrasound			
Electronystagmogram or Videonystagmogram			
Warm or cool air into ears, observe ey	es		
Vest Evoked Potentials			
Electrocochleography			
Hearing testing			

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Ocular Treatment

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Vest Therapy, vision therapy, refer to NeuroOptometry

Vestibular Rehabilitation

Gaze Stability and Adaptation exercises, postural Control training(Yoga, Tai Chi)



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