

VESTIBULAR REHABILITATION

ROBIN HARRINGTON, PT, DPT, OCS

KORT PHYSICAL THERAPY

2018



ROBIN HARRINGTON, PT, DPT, OCS

- KORT (Kentucky Orthopedic Rehab Team) Springhurst Physical Therapy
 - 3584 Springhurst Blvd Louisville, KY 40241
 - 502-339-4700
 - rsharrington@kort.com
- The majority of 57 locations within KORT provide vestibular rehabilitation



KORT AND AIB

- KORT worked closely for several years with Dr. Richard Gans from the American Institute of Balance:
 - AIB's website is www.dizzy.com
 - KORT's website is www.kort.com
 - Vestibular and Advanced Vestibular Certifications

DISCLOSURES

- Not applicable

OBJECTIVES:

- 1) Participants will understand and recognize the role of physical therapy/vestibular rehabilitation with the treatment of the dizzy or imbalanced patient population.
- 2) Provide an understanding on what a patient may expect in a vestibular rehabilitation evaluation and treatment plan.
- 3) Discuss the importance of a multidisciplinary approach with assessment, treatment and communication of all disciplines with the vestibular population.

WHAT IS VESTIBULAR REHABILITATION?

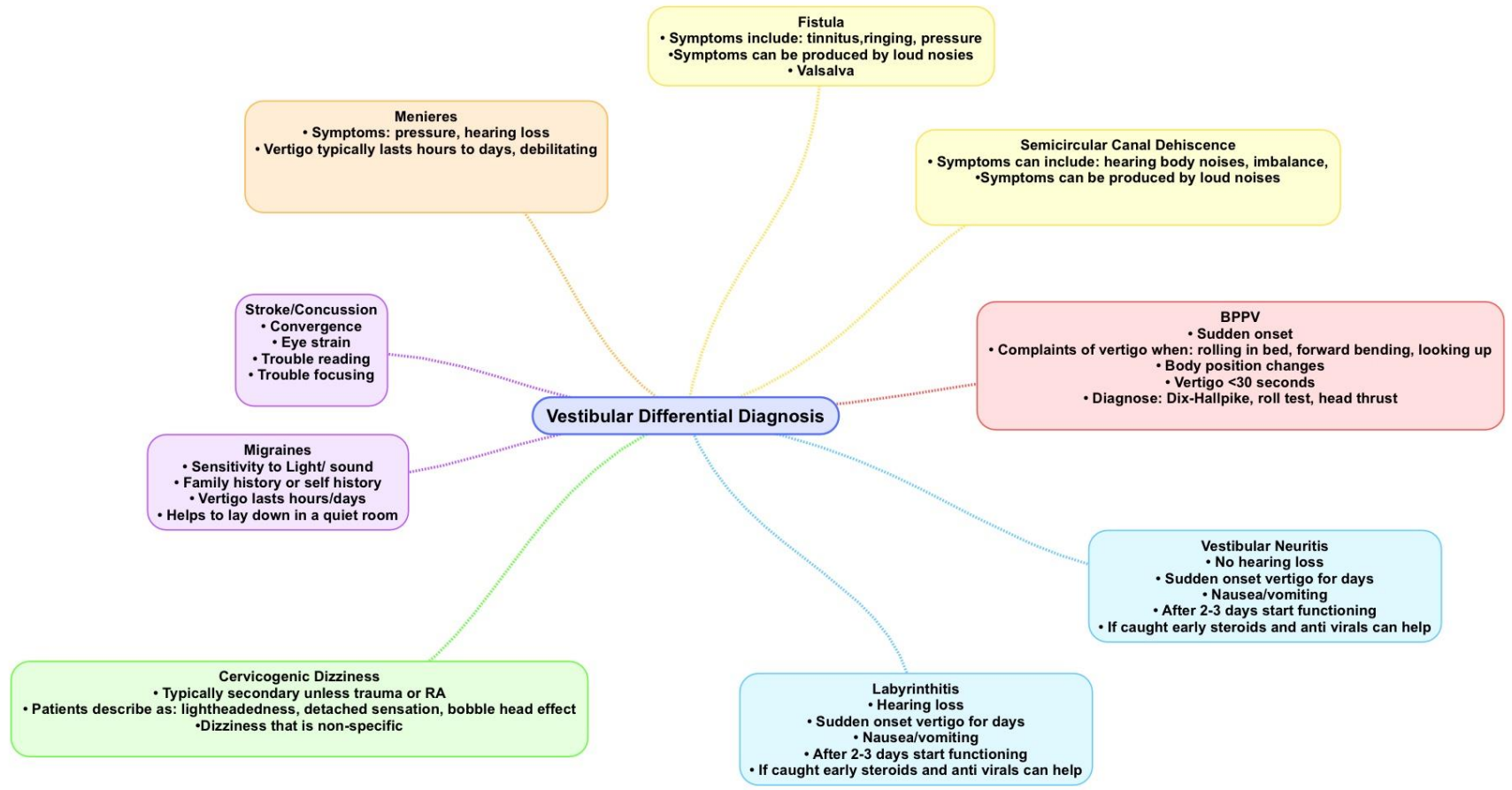
- It is an exercise approach to retrain the brain to recognize and process signals from the vestibular system in coordination with information from vision and proprioception. (VEDA)
- The exercise program is designed to promote central nervous system compensation for inner ear deficits. (VEDA)

HOW CAN PHYSICAL THERAPY BE UTILIZED?

- Neck stiffness that is limiting the ability to perform canalith repositioning maneuvers
- Musculoskeletal limitations:
 - Peripheral neuropathy
 - Limited range of motion in hip/knee/ankle regions
 - Weakness
- Fear of falling

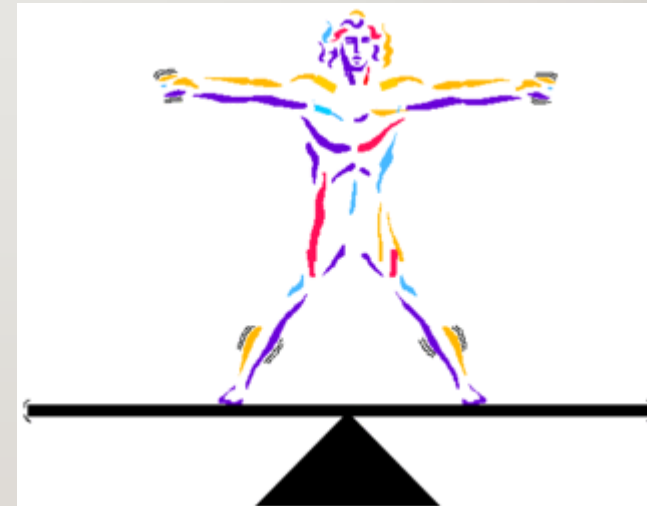
HOW THE PATIENT PRESENTS IN PHYSICAL THERAPY

- Many times patients come to PT without a specific diagnosis and we need to determine if they are appropriate for our care or if they need a referral.
- Our evaluation is trying to categorize them into a diagnosis group to help us determine the plan.
 - Neuro/central- concussion, migraine, stroke
 - Ortho- cervical and musculoskeletal restrictions
 - Vestibular- peripheral
 - Combination of the above



WHAT SHOULD BE EXPECTED IN PHYSICAL THERAPY?

- Evaluation:
 - Hx
 - Neuro Screen
 - Eye tracking- smooth pursuit, saccades, convergence
 - Cervical range of motion
 - Hip/knee/ankle range of motion
 - Posture
 - Strength
 - Functional testing
 - Head thrust
 - Dynamic Visual Acuity
 - Balance
 - Positional testing (Dix-Hallpike and Roll test)



[This Photo](#) by Unknown Author is licensed under [CC BY-SA](#)

FALL RISK ASSESSMENT

- Dynamic Gait Index- at risk if <19
 - Standardized functional gait assessment:
 - Gait assessment and ability to change speed
 - Head turns while walking
 - Body turn and stop
 - Stepping over and around objects
 - Stair climbing function



FALL RISK ASSESSMENT

- Timed up and go- >14 seconds increased risk for falls
 - Time it takes an individual to stand up from a chair, walk 10 ft and then return to sitting in chair
 - Important to assure gait speed is adequate for community activities (such as crossing street)



FALL RISK ASSESSMENT

- 30 second sit to stand
 - Ability to sit to stand from a chair multiple times, optimally without use of arms
 - Age Men Women
 - 60-64 >14 >12
 - 65-69 >12 >11
 - 70-74 >12 >10
 - 75-79 >11 >10
 - 80-84 >10 >9
 - 85-89 >8 >8
 - 90-94 >7 >4

TREATMENT INTERVENTIONS

- Adaptation- movement of head to improve gaze stabilization through VOR re-training
- Habituation- repetitive movement, which provokes symptoms to allow for compensation in the brain (desensitization)
- Substitution- enhancement of somatosensory and visual systems to assist postural control

ADAPTATION

- Adaptation - movement of head to improve gaze stabilization through VOR re-training
 - Position, speed (metronome), ROM, keeping in focus



HABITUATION

- Habituation- repetitive movement, which provokes symptoms to allow for compensation in the brain (desensitization)



SUBSTITUTION

- Substitution- enhancement of somatosensory and visual systems to assist postural control
 - COG, ROM, strength, reflex training



EXERCISE PROGRESSION

- Things to consider:
 - Position- supine > sit > stand > walk
 - Surface- solid > foam > rockerboard > exercise ball
 - Background- plain > pattern > moving
 - Environment- quiet > busy



EXERCISE PROGRESSION

- Balance
 - Static: feet apart, feet together, tandem, single leg stance
 - Dynamic: head turns, body turns, reaching, stepping over or onto
 - Cognitive: ask questions, quick recall, memory





CERVICAL

- Mobility
- Deep cervical flexor strengthening
- Cervical extensor strengthening
- Joint position error training

CERVICAL

- What if you turned your head 45 degrees, and your vestibular and visual system said you turned it 45 degrees, but your neck said you turned it 60 degrees?

CERVICAL

- Cervicogenic Dizziness results from a sensory mismatch between somatosensory information from the cervical spine and input from the visual and vestibular systems.

CERVICAL

- Cerviogenic dizziness was first described as “cervical vertigo” by Ryan and Cope in 1955.
- Definition:
 - “A non-specific sensation of altered orientation in space and disequilibrium originating from abnormal afferent activity from the neck.” (Furman and Cass, 1996)

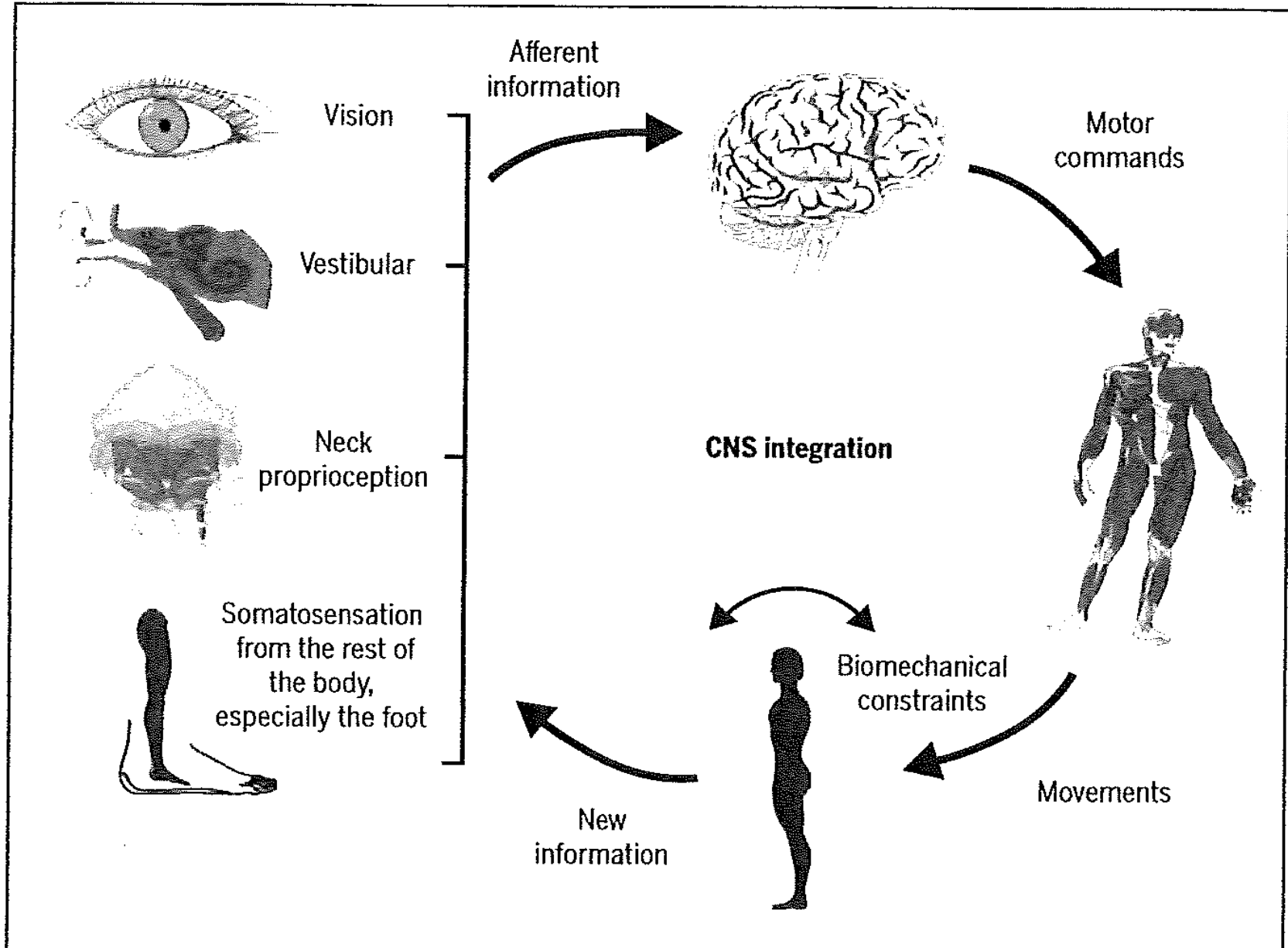


FIGURE 1. Input from the rest of the body is also an important source of information for the postural control system. The feet are peculiar in this respect as they aid in determining body sway relative to the ground. Abbreviation: CNS, central nervous system.

Cervicocollic reflex works with
the vestibulocollic reflex to
activate neck muscles and
protect the cervical spine
against over-rotation.

Kristjansson and Treleaven, 2009

Cervico-ocular reflex works with the vestibulo-ocular and optokinetic reflexes to control the extraocular muscles, creating clear vision with head movement.

Kristjansson and Treleaven, 2009



Vestibulospinal Reflex - postural control

Vestibulo-spinal/Cervico-ocular reflex interacts with the VOR and consists of eye movements driven by neck proprioceptors that can supplement the VOR under certain circumstances.



Vestibulo-ocular reflex
(VOR)-acts to maintain
stable vision during head
motion.

Wrisly (2000)

The tonic neck reflex maintains a stable posture via alteration in limb muscle activity when the body moves with respect to the head and is integrated with the vestibulospinal reflex.

Kristjansson and Treleaven, 2009

CERVICOGENIC DIZZINESS

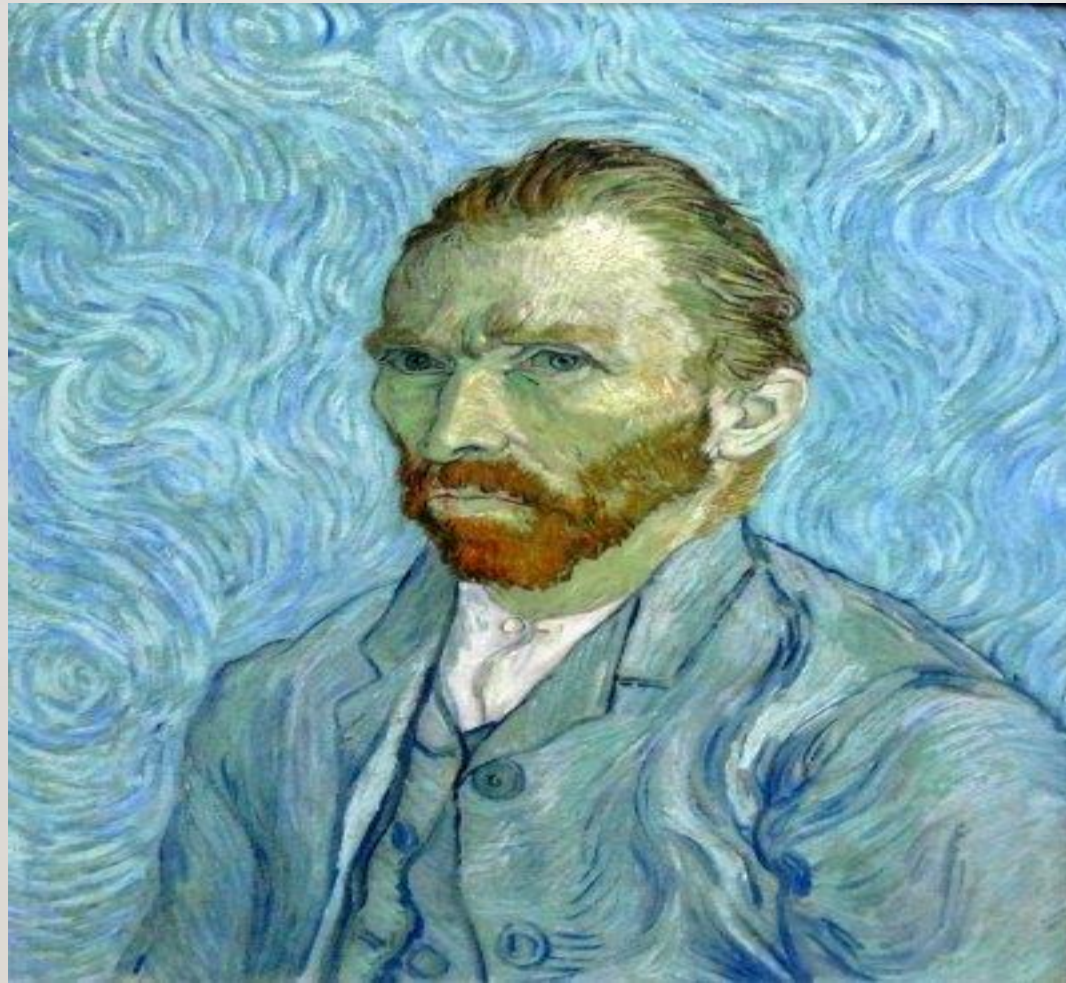
- It is a diagnosis of exclusion:
 - Considerations:
 - Previous neck injury and pathology
 - Forward head posture
 - Rheumatoid Arthritis
 - Relationship between neck pain and dizziness

CERVICOGENIC DIZZINESS

- Signs and symptoms: episodic
 - Dizziness/dysequilibrium/lightheadedness
 - Cervical pain
 - Limited cervical range of motion
 - Postural imbalance
 - Headache
 - Symptoms last minutes to hours with variable latency period
 - Related to head movement/position

OUTCOMES


- Dizziness Handicap Inventory-
 - Disability score
 - Emotional, functional and physical categories
 - Specific questions linked to BPPV
- Activity Balance Confidence Scale-
 - Confidence %
 - Can help you with determining fear of falling



<http://www.entkent.com/Cawthorne-Cooksey.html>

Vincent Van Gogh. Self portrait, 1889 - the year before he died. Although never diagnosed in life, and a controversial theory long after his death, an Gogh may well have suffered vertigo due to Ménière's disease . This depiction of the swirling vortex, the spinning, turning, moving world outside, experienced as taking control of his body, is familiar to many patients suffering from this inner ear disturbance.

KENTUCKY ORTHOPEDIC REHAB TEAM
KORT
The Best In Rehab.



EMPATHY HAS NO SCRIPT. THERE IS NO
RIGHT WAY OR WRONG WAY TO DO IT.
IT'S SIMPLY LISTENING, HOLDING SPACE,
WITHHOLDING JUDGMENT, EMOTIONALLY
CONNECTING, AND COMMUNICATING
THAT INCREDIBLY HEALING MESSAGE
OF "YOU'RE NOT ALONE."

COURAGE *works*
Braver living • loving with Brené Brown, Ph.D.

KENTUCKY ORTHOPEDIC REHAB TEAM
KORT
The Best In Rehab.™

MULTIDISCIPLINARY APPROACH



- The vestibular population needs a multidisciplinary approach to their care.
- Physical therapist can evaluate and address multiple systems that contribute to imbalance/falls.
- Audiology test results are very helpful for physical therapist to confirm clinical findings.
- Communication is key from all healthcare providers for optimal care.



IF WE WANT TO CULTIVATE HOPEFULNESS,
WE HAVE TO BE WILLING TO BE FLEXIBLE
AND DEMONSTRATE PERSEVERANCE.
NOT EVERY GOAL WILL LOOK AND FEEL THE
SAME. TOLERANCE FOR DISAPPOINTMENT,
DETERMINATION, AND A BELIEF IN SELF
ARE THE HEART OF HOPE.

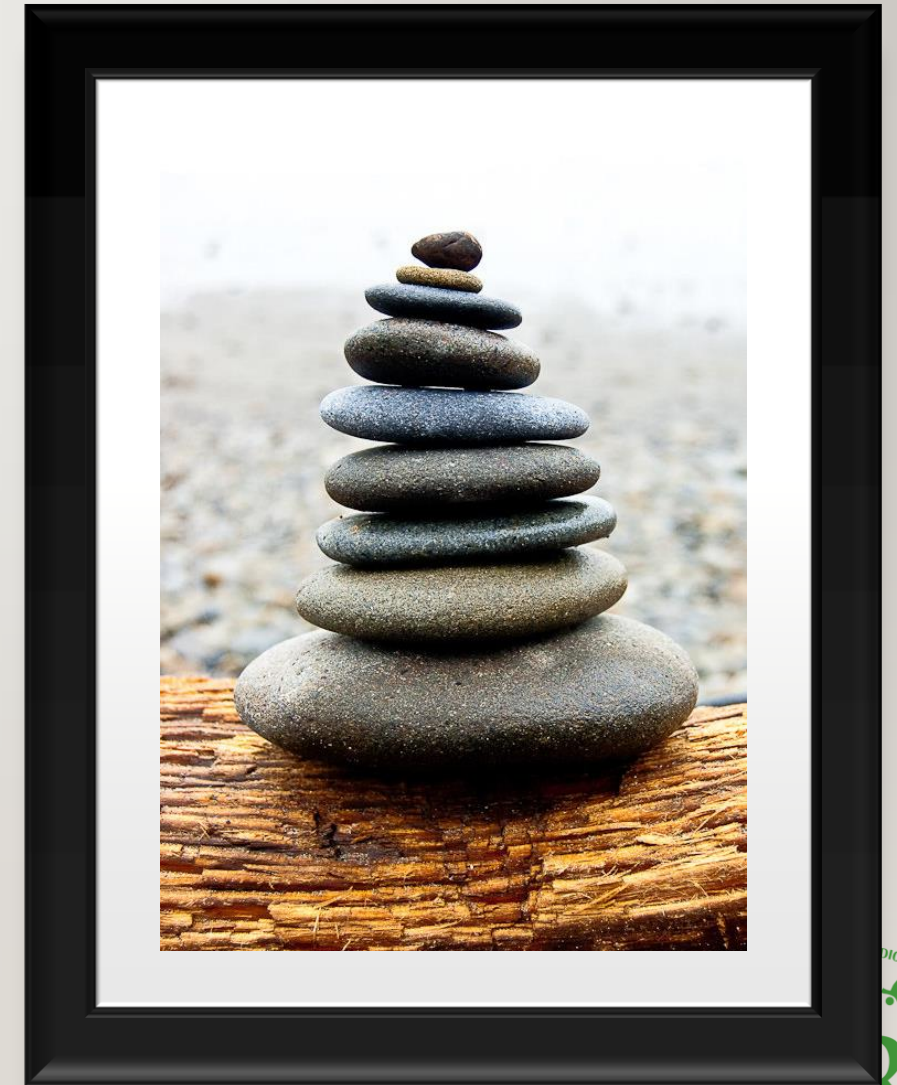
COURAGE *works*
Braver living · loving with Brené Brown, Ph.D.

KENTUCKY ORTHOPEDIC REHAB TEAM
KORT
The Best In Rehab.™

THANK YOU!

ROBIN HARRINGTON
DOCTOR OF PHYSICAL THERAPY
RSHARRINGTON@KORT.COM

Questions?



REFERENCES:

- Whitney S, Sparto P. Principles of vestibular physical therapy rehabilitation. *NeuroRehabilitation*. 2011;29:157-166.
- Hansson E. Vestibular rehabilitation-For whom and how? A systematic review. *Advances in Physiotherapy*. 2007;9:106-116.
- Kristjansson E. Sensorimotor function and dizziness in neck pain: implications for assessment and management. *Journal of Othropaedic and Sports Physical Therapy*. 2009;39: 364-377.
- Wrisley DM, Sparto PJ, Whitney SL, Furman JM (2000) Cervicogenic Dizziness:A Review of Diagnosis and Treatment. *J Ortho & Sports Med* 30 (12):755-766.
- Pictures- www.medbridgeeducation.com

REFERENCES:

- Peterson CM, Zimmerman CL, Tang R (2013) Proprioception interventions to improve cervical position sense in cervical pathology. *Inter J Ther and Rehab* 20 (3):154-163.
- Revel M, Minguel M, Gergoy P, Vaillant J, Manuel JL (1994) Changes in Cervicocephalic Kinesthesia After a Proprioceptive Rehabilitation Program in Patients with Neck Pain: A Randomized Controlled Study. *Arch Phys Med Rehabil* 75: 895-899.
- Lystad RP, Bell G, Martin BS, Carter CV (2011) Manual therapy with and without vestibular rehabilitation for cervicogenic dizziness: a systematic review. *Chiro and Man Ther* 19 (21):1-11.
- Childs JD, Flynn TW, Fritz JM, Piva SR, Whitman JM, Wainner RS, Greenman PE (2005) Screening for Vertebrobasilar insufficiency in patients with neck pain: manual therapy decision-making in presence of uncertainty. *J Ortho Sports Phys* 35: 300-306.
- Karlberg M, Manusson M, Maimstrom EM, Melander A, Ulrich M (1996) Postural and symptomatic improvement after physiotherapy in patients with dizziness of suspected cervical origin. *Arch Phys Med Rehabil* Sept 77:874-882.
- Landel, Rob. www.skillworks.bizx

REFERENCES

- Alsalaheen BA, Mucha A et al. Vestibular Rehabilitation for Dizziness and Balance Disorders after Concussion. *JNPT* 2010; 34: 87-93.
- Treleaven, J (2011) Dizziness, Unsteadiness, Visual Disturbances, and Postural Control. *Spine* 36: S211-S217.
- Pavlou M, Kanegaonkar RG, Swapp D, Bamiou DE, Slater M, Luxon LM (2012) The effect of virtual reality on visual vertigo symptoms in patients with peripheral vestibular dysfunction: A pilot study. *Journal of Vestibular Research* 22: 273-281.
- Naber C, Water-Schmeder O, Bohrer P, Matonak K, Bernstein A, Merchant M, (2011) Interdisciplinary Treatment for Vestibular Dysfunction: The Effectiveness of Mindfulness, Cognitive-Behavioral Techniques, and Vestibular Rehabilitation. *Otology and Neurotology* 145: 117-124.
- Treleaven J, Jull G, LowChoy N, (2005) Smooth Pursuit Neck Torsion Test in Whiplash-Associated Disorders: Relationship to Self-Reports of Neck Pain and Disability, Dizziness and Anxiety. *J Rehabil Med* 37: 219-223.