CERVICOGENIC DIZZINESS
SOMETHING TO CONSIDER.

Jennifer Burton, DPT
Jra.burton@gmail.com
Vestibular/Balance Program Manager
Salt Lake City Veteran Affairs Medical Center
OBJECTIVES

- Understand the signs and symptoms of Cervicogenic Dizziness (CGD).
- Understand how CGD is diagnosed.
- Become familiar with Joint Position Error (JPE) Testing and be able to demonstrate assessment used to assist in a diagnosis CGD.
- Become familiar with using JPE Target training as a treatment tool for CGD.
Have you had a patient that plateaus in his recovery after going through vestibular rehab following mTBI?

Does he complain his neck is tired or his head is heavy?

Does he complain of a “wobbling head, spacey, floating, or lightheadedness (that is not pre-syncope)?” ...but not TRUE vertigo.

Does he have neck pain and stiffness/lack of AROM?

Does he continue to exhibit problems with postural sway? Decreased BESS score from baseline?
DIFFERENTIAL DIAGNOSIS: POSSIBLE CAUSES OF DIZZINESS/IMBALANCE

- CNS disease or tumors
- Vestibular neuritis
- Medications
- Cardiovascular, Metabolic diseases
- TBI
- Cranial n VIII neuroma
- Meniere’s disease
- Postural Hypotension
- Ototoxicity
- Cervicogenic dysfunction
- Vertebrobasilar insufficiency (VBI)
- Migraines
- BPPV
- Psychiatric Disorder
- TMJ dysfunction
- AND MANY MORE!!!!
WHAT IS DIZZINESS?

- **Character of Dizziness:**
  - Vertigo or “Spinning”
  - Lightheadedness
  - Imbalance
  - Pre-syncope “Fainting or black out”
  - Confusion

- **Timing associated with Dizziness**
  - Seconds, Minutes, Hours?

- **Key Findings associated with Dizziness**
  - Headaches, nausea/vomitting, position or movement provoked, neck pain
WHAT ARE DIFFERENT ORIGINS OF DIZZINESS/IMBALANCE THAT WE OFTEN SEE IN REHAB?

- Central
- Peripheral
- Cervicogenic...on occasion. This is NOT a common diagnosis, but one to be considered.

YELLOW FLAG! Mental disorders (i.e. anxiety) are highly correlated with complaints of dizziness.
## Overview of a Physical Therapy Balance Exam:

<table>
<thead>
<tr>
<th>Central Screening and Oculomotor Testing</th>
<th>Neurologic/Coordination Screening</th>
<th>Musculoskeletal Tests</th>
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</thead>
<tbody>
<tr>
<td>• Observation for spontaneous nystagmus</td>
<td>• Rapid Alternating Movements</td>
<td>• A/PROM</td>
</tr>
<tr>
<td>• Smooth pursuit</td>
<td>• Heel Taps</td>
<td>• Strength (i.e MMT, Repeated Sit to Stands/30 secs)</td>
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<tr>
<td>• Saccades</td>
<td>• Nose to Finger</td>
<td>• Joint mobility as needed</td>
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<tr>
<td>• VOR Cancellation</td>
<td>• Vibration/Sensation</td>
<td></td>
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<tr>
<td>• Vergence</td>
<td>• Proprioception</td>
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<td></td>
<td>• Reflexes</td>
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</table>
# Overview of a Physical Therapy Exam:

<table>
<thead>
<tr>
<th>BPPV Testing</th>
<th>Peripheral VOR Testing</th>
<th>Standardized Functional Tests</th>
<th>Cervicogenic Testing (when indicated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• VBI Clearance</td>
<td>• Head shake</td>
<td>• DGI/FGA</td>
<td>• Smooth Pursuit Neck Torsion Test</td>
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<tr>
<td>• Dix- Hallpike</td>
<td>• Head Thrust</td>
<td>• Gait Velocity</td>
<td>• Head/Neck Differentiation Test</td>
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<td>• Head Roll</td>
<td>• Dynamic Visual Acuity Test (DVAT)</td>
<td>• Berg</td>
<td>• <strong>Joint Position Error Testing</strong></td>
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<tr>
<td></td>
<td></td>
<td>• TUG</td>
<td>(JPE)</td>
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<tr>
<td></td>
<td></td>
<td>• ABC</td>
<td></td>
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<tr>
<td></td>
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<td>• DHI</td>
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<td></td>
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<td>• MSQ</td>
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<tr>
<td></td>
<td></td>
<td>• Balance Master (SOT/ADT) or CTSIB</td>
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</tr>
</tbody>
</table>
CONSIDERING A DIAGNOSIS OF CERVICOGENIC DIZZINESS (CGD)...

- **What Is it?**
  - A sensory mismatch between cervical somatosensation and vestibular and visual inputs about head position.
  - Traumatic, degenerative, inflammatory, or mechanical problems in the c-spine can cause CGD.

- **What type of injury is most associated with CGD?**
  - Cervical Flexion/Extension injuries ("Whiplash")
  - Severe cervical arthritis
  - Herniated cervical discs
  - Head trauma
HOW IS CERVICOGENIC DIZZINESS DIAGNOSED?

- It is a Diagnosis of EXCLUSION!
- Central? Peripheral?.....Cervicogenic!
- It is NOT a common diagnosis.
  - Most people DO NOT meet ALL the requirements for cervicogenic dizziness.
- However, including cervical proprioception training as part of complete program with neck pain rehabilitation may possibly improve overall outcome.
HOW IS CERVICOGENIC DIZZINESS DIAGNOSED?

- Required signs and symptoms:
  - MUST have history of neck trauma or pathology with a current complaint of neck pain to even consider a diagnosis.
  - MUST have current complaint of dizziness usually characterized by “lightheadedness (but not presyncope), spacey, off, head is not attached to my body, etc.” Rarely do patients complain of true vertigo.
  - Impairments (AROM, decreased strength/endurance, abnormal postural sway) with a variety of examination procedures.
  - May also have occipital region headache, jaw pain, or radicular symptoms.
HOW IS CERVICOGENIC DIZZINESS DIAGNOSED?

- **Examination Tools***
  - Cervical active/passive ROM
  - Cervical joint mobility assessment - especially upper cervical.
  - Cervical deep neck flexors/extensors strength/endurance testing.
  - Postural Sway Testing (CTSIB, SOT)
  - Neck Torsion Smooth Pursuit
  - Head-Neck Differentiation Test
  - **JOINT-POSITION ERROR TESTING (JPE Testing)**
    - Testing for Neck Proprioception.

*(Testing only to be considered once central and peripheral causes of dizziness have been addressed. In addition, before further examination and treatment, if pt underwent trauma, neck stability needs to be cleared with at minimal clinical testing, such as Alar lig and transverse lig integrity testing or with imaging especially if pt exhibits any red flag symptoms.)*
The cervical joint position error test (JPE) is used to assess cervicocephalic proprioception and neck reposition sense.

The cervical JPE tests one’s ability to relocate the head back to center after maximal or submaximal rotation in the transverse (R/L neck rotation) and sagittal planes (neck flexion/extension).
JPE TESTING

- Acknowledge Rob Landel, PT, DPT, OCS, CSCS, FAPTA, USC PT - provided calibrated target.

- Tools Needed:
  - Target at 90 cm distance from crown of patient’s head to wall
  - Chair for patient to sit in
  - Laser light/pen secured to patient’s head.

- www.skillworks.biz
INSTRUCTIONS:

- Patient should be seated in a chair that has a backrest with vision occluded with a blindfold or eyes closed.
- The target should be placed 90 cm in front of the patient and able to be adjusted to the patient’s neutral head position (NHP). This is the zero point or center of the target.
- The patient is fitted with a laser pointer or similar targeting device to measure magnitude of head displacement from the starting position.
- The patient is instructed to perform an active head rotation to one side, after which he or she should return back to the “neutral” or starting head position.
Once patient feels they have reached neutral position, have them open their eyes and observe where laser beam is located...inside or outside of the 4.5 degree allowance?

This must be repeated until patient has three consistent performances...good or bad.

Test in all directions: R/L rotation, flexion/extension.
Normal Test
- Patient able to consistently return laser beam within 4.5 degrees or white area of target.

Abnormal Test
- Patient consistently return laser beam > 4.5 degrees.
- Provocation of dizziness.
JPE Evaluation

- Be familiar with the Joint Position Error (JPE) TESTING related to cervicogenic dizziness.
- Learn how to correctly set-up testing environment.
- Be familiar with normal and abnormal performance using the Joint Position Error Test
Possible Treatment Recommendations:

- **Joint Mobilization:**
  - upper cervical, mid cervical, thoracic

- **Cervical strengthening/stabilization:**
  - flexors and extensors

- **Cervical Proprioception**
  - Use Joint Position Error Target for Training!

- **Postural Sway**
  - Consider putting patient in static and dynamic challenges associated with different sensory environments they find challenging.
Use Joint Position Error Target as a tool for training!
DESIRED OUTCOMES WITH JPE TRAINING

- Restore cervical proprioception, especially in difficult or complex environmental situations
- Reduce or eliminate complaints of dizziness
- Reduce overall postural sway (Improve CTSIB, SOT)
- Indirectly improve cervical ROM
**JPE TREATMENT**

- Use a laser on the head to provide feedback while the patient practices returning the head to a starting position,
  - eyes open (knowledge of performance)
  - eyes closed (knowledge of results).

Use in combination with joint and soft tissue mobilizations strengthening/endurance training, and postural training.
What are some progression variables to consider?

- Target
- Speed of Movement
- Range of Movement
- Static to Dynamic
- Changes in sensory conditions
- Repetitions
- Cognitive Tasking
- Biomechanical
WORKSHOP GOALS

Begin Target Practice!

**JPE Treatment**
- Design and implement TREATMENT ideas using JPE Target.
- Think of a variety ways of how to progress treatment using the JPE target and rehab accessories.
- Discuss with other group members potential low level and high level progression ideas.
RESOURCES & REFERENCES

- Rob Landel, PT, DPT, OCS, CSCS, FAPTA, USC PT
- www.Skillworks.biz
- www.rehabmeasures.org