**Session Title:** Vestibular Rehabilitation for Peripheral Vestibular Hypofunction: Clinical Practice Guideline and Beyond!

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I. **Background and Need for a Clinical Practice Guideline on Vestibular Rehabilitation in Persons with Peripheral Vestibular Hypofunction**

Dizziness is one of the most common reasons patients seek medical care from primary care providers, and the cause of dizziness is often related to the vestibular system (Kroenke & Mangelsdorff, 1989). Uncompensated vestibular hypofunction results in postural instability, visual blurring with head movement, and subjective complaints of dizziness and/or imbalance. The precise incidence and prevalence of peripheral vestibular hypofunction is difficult to ascertain. The reported incidence of vestibular neuritis, a common etiology underlying vestibular hypofunction, is approximately 15 per 100,000 people (Adamec et al., 2015; Neuhauser et al., 2005). Based on a meta-analysis of published studies, Kroenke et al. (2000) estimated that 9% of the approximately 7 million clinic visits (or 630,000 clinic visits) each year for dizziness are due to vestibular neuritis or labyrinthitis.

At the time of submission, there are no clinical practice guidelines (CPG) for the treatment of peripheral vestibular hypofunction; thus, it was determined that a CPG to address appropriate vestibular exercise options for use with patients with unilateral and bilateral peripheral vestibular hypofunction was appropriate. This CPG is a summary of practice recommendations that are supported with current published literature that has been reviewed by expert practitioners and other stakeholders. These parameters of practice should be considered guidelines only, not mandates.

II. **Overview of the Clinical Practice Guideline Process**

The vestibular guideline workgroup (Courtney Hall, Susan Herdman, Susan Whitney) proposed the topic to the APTA and Neurology Section and attended the APTA Workshop on Developing Clinical Practice Guidelines in July, 2012. An expert multidisciplinary Advisory Board was formed and met periodically via conference call to provide critical input and feedback in the development of the Vestibular Rehabilitation CPG. Board members included: Stephen Cass, MD (otolaryngology); Richard Clendaniel, PT, PhD (physical therapy/researcher); John Engberg, PhD (patient); Joseph Furman, MD, PhD (neurology); Terry Fife, MD (neurology); Tom Getchius, (Director of Clinical Practice, American Academy of Neurology); Joel Goebel, MD (otolaryngology); Neil Shepard, PhD (audiology); Sheelah Woodhouse, PT (Vestibular Education Disorders Association Board).
CPG Steps:

1. Refinement of clinical questions
2. Comprehensive, systematic literature search
3. Identification of relevant studies to be included
4. All relevant studies were critically appraised (Table 1) and study characteristics extracted by trained, reliable and valid volunteer reviewers
5. Grades of recommendation were assigned to each action statement (Table 2) based on the overall strength of the evidence to support the action statement.
6. Reviews/comments of 1st draft of CPG document by APTA/Neurology Section/Public (via email blasts to professional organizations including Audiology, Neurology, Otolaryngology, and Physical Therapy)
7. Revised CPG is reviewed by APTA/Neurology Section
8. Manuscript is submitted to JNPT for peer review
9. Accepted manuscript submitted to Neurology Section for approval
10. Dissemination

Table 1. Level of evidence

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>I</td>
<td>Evidence obtained from high-quality (≥ 50% critical appraisal score) diagnostic studies, prospective studies, or randomized controlled trials</td>
</tr>
<tr>
<td>II</td>
<td>Evidence obtained from lesser quality (&lt; 50% critical appraisal score) diagnostic studies, prospective studies, or randomized controlled trials</td>
</tr>
<tr>
<td>III</td>
<td>Case-controlled studies or retrospective studies</td>
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<tr>
<td>IV</td>
<td>Case study or case series</td>
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<tr>
<td>V</td>
<td>Expert opinion</td>
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Table 2. Grades of Recommendations

<table>
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<tr>
<th>Grade</th>
<th>Recommendation</th>
<th>Strength of Recommendation</th>
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<tbody>
<tr>
<td>A</td>
<td>Strong evidence</td>
<td>A preponderance of Level I and/or Level II studies supports the recommendation. This must include at least one Level I study.</td>
</tr>
<tr>
<td>B</td>
<td>Moderate evidence</td>
<td>A single high quality RCT or a preponderance of Level II evidence supports the recommendation.</td>
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<tr>
<td>C</td>
<td>Weak evidence</td>
<td>A single Level II Study or a preponderance of Level III and IV studies supports the recommendation.</td>
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<tr>
<td>D</td>
<td>Expert opinion</td>
<td>Best practice based on the clinical experience of the guideline development team and guided by the evidence, which may be conflicting. Where higher quality studies disagree with respect to their conclusions, it may be possible to come to agreement on certain aspects of intervention (e.g., variations in treatment/diagnostic test, population or setting that may account for conflict).</td>
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III. SUMMARY OF ACTION STATEMENTS

Action Statement 1: EFFECTIVENESS OF VESTIBULAR REHABILITATION IN PERSONS WITH ACUTE AND SUBACUTE UNILATERAL VESTIBULAR HYPOFUNCTION. Clinicians should offer vestibular rehabilitation to patients with acute or subacute unilateral vestibular hypofunction. (Evidence quality: I; Recommendation Strength: Strong)

Action Statement 2: EFFECTIVENESS OF VESTIBULAR REHABILITATION IN PERSONS WITH CHRONIC UNILATERAL VESTIBULAR HYPOFUNCTION. Clinicians should offer vestibular rehabilitation to patients with chronic unilateral vestibular hypofunction. (Evidence quality: I; Recommendation Strength: Strong)

Action Statement 3: EFFECTIVENESS OF VESTIBULAR REHABILITATION IN PERSONS WITH BILATERAL VESTIBULAR HYPOFUNCTION. Clinicians should offer vestibular rehabilitation to patients with bilateral vestibular hypofunction. (Evidence quality: I; Recommendation Strength: Strong)

Action Statement 4: EFFECTIVENESS OF SACCADIC OR SMOOTH-PURSUIT EXERCISES IN PERSONS WITH PERIPHERAL VESTIBULAR HYPOFUNCTION (UNILATERAL OR BILATERAL). Clinicians should not offer saccadic or smooth-pursuit exercises in isolation (i.e., without head movement) as specific exercises for gaze stability to patients with unilateral or bilateral vestibular hypofunction. (Evidence quality: I; Recommendation Strength: Strong)

Action Statement 5: EFFECTIVENESS OF DIFFERENT TYPES OF EXERCISES IN PERSONS WITH ACUTE OR CHRONIC UNILATERAL VESTIBULAR HYPOFUNCTION. Clinicians may provide targeted exercise techniques to accomplish specific goals appropriate to address identified impairments and functional limitations. (Evidence quality: II; Recommendation Strength: Moderate)

Action Statement 6: EFFECTIVENESS OF SUPERVISED VESTIBULAR REHABILITATION. Clinicians may offer supervised vestibular rehabilitation to patients with unilateral or bilateral peripheral vestibular hypofunction. (Evidence quality: I - III; Recommendation Strength: Moderate)

Action Statement 7: OPTIMAL EXERCISE DOSE OF TREATMENT IN PEOPLE WITH PERIPHERAL VESTIBULAR HYPOFUNCTION (UNILATERAL AND BILATERAL). Clinicians may prescribe a home exercise program of gaze stability exercises consisting of a minimum of 3 times per day for a total of at least 12 minutes per day for patients with acute/subacute vestibular hypofunction and at least 20 minutes per day for patients with chronic vestibular hypofunction. (Evidence Quality: V; Recommendation Strength: Expert opinion)

Action Statement 8: DECISION RULES FOR STOPPING VESTIBULAR REHABILITATION IN PERSONS WITH PERIPHERAL VESTIBULAR HYPOFUNCTION (UNILATERAL AND BILATERAL). Clinicians may use achievement of primary goals, resolution of symptoms, or plateau in progress as reasons for stopping rehabilitation. (Evidence Quality: V; Recommendation Strength: Expert opinion)
**Action Statement 9**: FACTORS THAT MODIFY REHABILITATION OUTCOMES. Clinicians may evaluate factors that could modify rehabilitation outcomes. (Evidence quality: I-III; Recommendation Strength: Weak to Strong)

**Action Statement 10**: THE HARM/BENEFIT RATIO FOR VESTIBULAR REHABILITATION IN TERMS OF QUALITY OF LIFE/PSYCHOLOGICAL STRESS. Clinicians should offer vestibular rehabilitation for persons with peripheral vestibular hypofunction. (Evidence quality: Level I-III; Recommendation Strength: Strong)

**IV. SUMMARY OF RESEARCH RECOMMENDATIONS**

**Research Recommendation 1.** Researchers should examine the concept of a critical period for optimal vestibular compensation through studies that examine early versus delayed intervention. Researchers should identify factors that predict which patients will recover without the benefit of vestibular rehabilitation and which patients will need vestibular rehabilitation to optimize outcomes.

**Research Recommendation 2.** With the advent of new diagnostic tools, it is possible to assess the functioning of each component of the vestibular apparatus. Researchers should examine rehabilitation outcomes in persons with damage to semicircular canal versus otolith components of the vestibular apparatus. Furthermore, researchers should examine the impact of the magnitude and range of hypofunction relative to functional recovery.

**Research Recommendation 3.** There is a paucity of research on the effectiveness of vestibular rehabilitation in children. Researchers should examine rehabilitation outcomes in children with confirmed vestibular dysfunction based on vestibular laboratory tests. Additionally, researchers should examine the concept of a critical period of balance development in children in the context of providing vestibular rehabilitation. This is especially important in light of the number of children who are receiving cochlear implants at a very young age and the surgical procedure may affect vestibular function.

**Research Recommendation 4.** There is sufficient evidence that vestibular exercises compared to no or placebo exercises is effective; thus, future research efforts should be directed to comparative effectiveness research. Researchers should directly compare different types of vestibular exercise in large clinical trials to determine optimal exercise approaches.

**Research Recommendation 5.** Researchers should include measures of compliance in order to understand the impact of supervision. Researchers need to incorporate intent-to-treat research designs in order to understand dropout rates related to supervision.

**Research Recommendation 6.** Researchers should examine the impact of frequency, intensity, time and type of exercises on rehabilitation outcomes. Researchers should determine the difficulty of exercises and how to progress patients in a systematic manner.
Research Recommendation 7. Researchers should determine optimal duration of vestibular rehabilitation for favorable outcomes and the factors that impact functional recovery.

Research Recommendation 8. Researchers should perform longitudinal studies. Researchers should examine time from onset and see if it affects short- and long-term outcomes.

Research Recommendation 9. Researchers should examine the concept of return to work. Areas for study include job requirements that may be difficult for patients with vestibular hypofunction, job modification or assistive technology to allow return to work, criteria for return to work or disability assignment, indicators for return to safe driving.
Bibliographic References of the CPG:

1. Fetters L, Tilson J. Evidence based physical therapy. FA Davis; 2012.


Compiled 12/7/15