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**2021 ANNUAL CONFERENCE**

# Clinical Practice Guidelines Related to Vestibular Impairment

# Clinical Practice Guidelines for BPPV

Published in 2017 as an update of previous guidelines from the American Academy of Otolaryngology-Head and Neck Surgery

Target Age= 18 years and older

Provided evidence-based recommendations for BPPV

\*Guidelines are never intended to supercede professional judgement

# PURPOSE

1. Improve quality of care and outcomes for BPPV by improving accurate and efficient diagnosis of BPPV
2. Reduce the inappropriate use of vestibular suppressant medications
3. Decrease inappropriate use of ancillary testing
4. Increase appropriate use of therapeutic assessment and treatment

# Financial Impact

- ▶ Estimated cost approx. \$2000.00 to arrive at diagnosis of BPPV and > 65% of pts. with this condition will undergo potentially unnecessary diagnostic testing or therapeutic interventions
- ▶ Health care costs associated with BPPV dx. alone approaches \$2 billion per year
  1. 70% will undergo MRI
  2. 45% will have CT scan
  3. 41% will have electrocardiogram
  4. 53% will be treated with medications
- ▶ Almost 86% of people with BPPV will suffer some interrupted daily activities and lost days at work
- ▶ 68% will reduce their workload
- ▶ 4% will change jobs
- ▶ 6% will quit their jobs as a result of the condition
- ▶ With the increasing age of the US population, the incidence and prevalence of BPPV is projected to increase over the next 20 years

Wang, H., et al. *Eur Arch Otorhinolaryngol* (2014) 271: 261  
vonBrevorn, M. et al. *J Neurol Neurosurg Psychiatry* (2007) 78:710-715  
Li, J C, et al. *Otolaryngol Head Neck Surg* (2000) 122:334-339  
Grill, E., et al. *J Neurol* (2014) 261:1492-1498

# Intended Audience

All clinicians likely to diagnose and manage patients with BPPV and applies to ANY setting in which BPPV would be identified, monitored, or managed.

Accounts for 5.6 million clinic visits in the U.S. annually

# Strength of Guideline Statements

## STRONG RECOMMENDATION

- Benefits clearly outweigh harm
- Quality of supportive evidence is high (Grade A or B)
- Implied Obligation to Clinician: should follow unless clear and compelling rationale for an alternate approach

# Strength of Guideline Statements

## RECOMMENDATION

- Benefits outweigh harm
- Quality of evidence not as high (Grade B or C)
- Implied Obligation to Clinician: should generally follow recommendation but should remain alert to new information and sensitive to patient preferences



# Strength of Guideline Statements

## OPTION

- Quality of evidence is suspect (Grade D) OR well-done studies (Grade A, B, C) show little clear advantage of 1 approach vs. another
- Implied Obligation to Clinician: Clinicians should be flexible in their decision making regarding appropriate practice

# GUIDELINE STATEMENTS

## STATEMENT 1a- DIAGNOSIS OF POSTERIOR SEMICIRCULAR CANAL BPPV

Statement Strength: STRONG RECOMMENDATION

\*Key points regarding recommendation

- Diagnosis based on history and physical exam with Dix-Hallpike
- “Subjective BPPV”
- Dix-Hallpike considered “Gold Standard”
- Diagnostic Characteristics
  - Latency
  - Duration
  - Fatigability

# GUIDELINE STATEMENTS

## STATEMENT 1b- DIAGNOSIS OF LATERAL (HORIZONTAL) SEMICIRCULAR CANAL BPPV

Statement Strength: RECOMMENDATION

\*Key points regarding recommendation

- Distinguishing Features

- Often hard to symptomatically distinguish from posterior canal BPPV
- Self-resolution more quickly than posterior canal BPPV
- Nystagmus findings
  - Geotropic
  - Apogeotropic
  - Identifying affected side

# GUIDELINE STATEMENTS

## STATEMENT 2a- DIFFERENTIAL DIAGNOSIS

Statement Strength: RECOMMENDATION

\*Key points regarding recommendation

- Differentiate BPPV from otologic, neurologic, and/or other disorders
  - Non-specific dizziness
  - Timing and triggers of dizziness
  - Peripheral vs Central

# GUIDELINE STATEMENTS

## STATEMENT 2b- MODIFYING FACTORS

Statement Strength: RECOMMENDATION

\*Key points regarding recommendation

- Co-morbidities
  - Migraine
  - Osteoporosis/Osteopenia
  - Head Trauma
- Falls/Fall risk
  - Assessment of risk for falls with all BPPV evaluations

# STATEMENT GUIDELINES

## STATEMENT 3a- RADIOGRAPHIC TESTING

Statement Strength: RECOMMENDATION AGAINST

## STATEMENT 3b- VESTIBULAR TESTING

Statement Strength: RECOMMENDATION AGAINST

# STATEMENT GUIDELINES

## STATEMENT 4a- REPOSITIONING PROCEDURES

Statement Strength: STRONG RECOMMENDATION

\*Key points regarding recommendation

- Posterior Canal BPPV Treatments
  - CRP (Epley)
  - Liberatory (Semont)
  - Self-Administered CRP
- Lateral Canal BPPV Treatments
  - Barbecue Roll (Lempert, 360 roll)
  - Gufani
  - Forced Prolonged Positioning

# STATEMENT GUIDELINES

## STATEMENT 4b- POSTPROCEDURAL RESTRICTION

Statement Strength: STRONG RECOMMENDATION AGAINST

\*Key points regarding recommendation

- Traditional Recommendations
- Current Evidence
- Special Considerations



# STATEMENT GUIDELINES

## STATEMENT 4C: OBSERVATION AS INITIAL THERAPY

Statement Strength: OPTION

\*Key points regarding recommendation

- Symptom resolution in 15% to 85% at 1 month without intervention
- Cost Savings
- Education Needs
- Fall Risk

# STATEMENT GUIDELINES

## STATEMENT 5- VESTIBULAR REHABILITATION

Statement Strength: OPTION

\*Key points regarding recommendation

- Offer additional therapy to patients
  - Fail initial CRP attempts, refuse CRP, not candidates
  - Additional Impairments
- May be better as adjunctive therapy rather than primary treatment
  - Prevention of more chronic disabling dizziness
  - Prevention of falls

# STATEMENT GUIDELINES

## STATEMENT 6- MEDICAL THERAPY

Statement Strength: RECOMMENDATION AGAINST

\*Key points regarding recommendation

- Decrease use of unnecessary medications with potential for harm
  - Benzodiazepines ie:diazepam-significant independent risk factor for falls
  - Antihistamines ie:meclizine-can negatively affect cognitive function, decrease GI motility, increase urinary retention, affect vision and cause dry mouth in the elderly
- Reduced costs
- Prevention of decreased diagnostic sensitivity during Dix-Hallpike
- Interference with central compensation
- Pre-medicate in cases of severe nausea and/or vomiting

# STATEMENT GUIDELINES

## STATEMENT 7a- OUTCOME ASSESSMENT

Statement Strength: RECOMMENDATION

\*Key points regarding recommendation

- Reassess for accuracy of diagnosis
- Reassess for continued vestibular symptoms
- Allows clinical judgement regarding most appropriate follow-up
- Time interval for reassessment

# STATEMENT GUIDELINES

## STATEMENT 7b- EVALUATION OF TREATMENT FAILURE

Statement Strength: RECOMMENDATION

\*Key points regarding recommendation

- Reason for treatment failure reassessment
  - Persistent BPPV may be present and responsive to additional maneuvers
  - Coexisting vestibular conditions may be present
  - Serious CNS disorders may simulate BPPV

# STATEMENT GUIDELINES

## STATEMENT 8- EDUCATION

Statement Strength: RECOMMENDATION

\*Key points regarding recommendation

- Components of Education
  - What BPPV is
  - Recurrence risk
  - Increased fall risk
  - Importance of follow-up if initially treated with observation
  - Atypical symptoms

# CLINICAL PRACTICE GUIDELINES- Peripheral Hypofunction

- Guidelines issued in 2016 based on literature published between 1985 and Feb. 2015 (revision in process)
- Advisory board composed of audiology, neurology, otolaryngology, patient representative, and physical therapy
- Study types included: meta-analyses, systematic reviews, randomized controlled trials, cohort studies, case control studies, and case series/studies

# Levels of Evidence/Grade of Recommendations

- Levels Evidence rated I-V
  - I- evidence obtained from high-quality diagnostic studies, prospective studies, or randomized control trials
  - II- lesser quality diagnostic studies, prospective studies, or randomized control trials
  - III- Case controlled studies or retrospective studies
  - IV- Case study or case series
  - V- Expert Opinion
- Grades of Recommendation A-D
  - A= strong evidence
  - B= moderate evidence
  - C= weak evidence
  - D= expert opinion



# BACKGROUND

- 35.4% of adults in U.S. have vestibular dysfunction requiring medical attention
  - Nearly 85% of people aged 80+ have vestibular dysfunction
  - People with vestibular disorders reported to have 8-fold increase in risk for falling
  - People with bilateral vestibular hypofunction had a 31-fold increase in odds of falling
- 2015 Cochrane Database Systematic Review
  - Moderate to strong evidence to support vestibular rehab in the management of unilateral vestibular hypofunction
  - Moderate evidence to support the effectiveness of vestibular exercises in individuals with bilateral vestibular hypofunction for improving gaze and postural stability

# DIAGNOSTIC CRITERIA

- Confirmation by either caloric or rotary chair testing for an article to be included (Caloric response reduced at 25% or greater)
- Excluded studies
  - Primarily central involvement
  - BPPV
- Timeline definition
  - acute= first 2 weeks post onset of symptoms
  - subacute= 2weeks to 3 months post onset of symptoms
  - chronic= presence of symptoms longer than 3 months

# Vestibular Rehabilitation

- Exercise based approach
  - Gaze stabilization
  - Habituation
  - Balance and gait
  - Walking for endurance

# Action Statements

Action Statements 1, 2, and 3: (Effectiveness of Vestibular Rehabilitation in Persons with ACUTE and SUBACUTE Unilateral Vestibular Hypofunction, CHRONIC Unilateral Vestibular Hypofunction, and BILATERAL Vestibular Hypofunction)

Evidence Quality- Level I

Recommendation Strength- STRONG

Studies related to action statement #1 included schwannoma, Meniere's , neuritis, all of which demonstrated improvement in balance, dizziness, and oscillopsia with vestibular rehabilitation

# Action Statements

- Studies addressing chronic unilateral vestibular hypofunction
  - Decreased dizziness/motion sensitivity
  - Improved Gaze Stability
  - Improved postural stability
  - Increased strength and endurance
- Studies addressing bilateral vestibular hypofunction
  - Studies as a whole demonstrated improvement in gaze stability, static postural stability, gait, and symptoms of dizziness
  - Not all individuals improved, individuals did not improve on all measures, great variability
  - Included the only experimental study in children in which vestibular dysfunction was confirmed by laboratory testing
    - Results suggest children respond similarly to adults, although more research needed
- Research Recommendations
  - Research regarding outcomes related to damage to different vestibular components (semicircular canals vs. otolith components of the vestibular apparatus)
  - Further research regarding children with vestibular dysfunction including critical periods of balance development especially due to potential vestibular dysfunction following cochlear implantation

# Action Statements

Action Statement 4: Effectiveness of saccadic or smooth-pursuit exercises in persons with peripheral vestibular hypofunction (unilateral OR bilateral)

Evidence Quality- Level I

Recommendation Strength- Strong (to NOT offer in isolation)

- Studies included, demonstrated no improvement of dynamic visual acuity with use of saccadic and smooth pursuit exercises

# Action Statement

Action Statement 5: Effectiveness of different types of exercises in persons with acute or chronic unilateral vestibular hypofunction

Evidence Quality- Level II

Recommendation Strength- Moderate

- Few studies have examined whether any one vestibular exercise is more beneficial than another
- Exercise specificity supported in treatment of patients with vestibular hypofunction
  - Balance exercises (Tai Chi) improved whole body stability
  - Vestibular Exercises (adaptation and eye-head exercises) improved gaze stability
- Dynamic virtual reality environments should be considered as a useful adjunct to vestibular exercises (chronic vestibular disorders and visual vertigo)

# Action Statement

## Action Statement 6: Effectiveness of Supervised Vestibular Rehabilitation

Evidence Quality- II

Recommendation Strength- Moderate

- Possibly better adherence with a supervised exercise program
  - Supervision helps clinician modify program as needed (ie: nausea, fatigue)
  - Supervision can promote improved psychological state (ie: anxiety control)
- Several studies (Levels I and II) demonstrate that patients may respond better to customized, supervised rehabilitation than to generic exercises or solely a home program



# Action Statement

## Action Statement 7: Optimal Exercise Dose of Treatment in People with Peripheral Vestibular Hypofunction (Unilateral and Bilateral)

Evidence Quality- V

Recommendation Strength- Expert Opinion

- Two level I and One level II studies suggest 3 times daily for a total of 12 min of gaze stabilization may be sufficient to induce recovery in patients during the acute and subacute stages of vestibular hypofunction
- Four studies (Two level I and Two Level II) suggest 3 times daily for a total of 20 min may be sufficient to induce recovery with chronic unilateral vestibular hypofunction

# Action Statement

## Action Statement 8: Decision Rules for Stopping Vestibular Rehabilitation in Persons with Unilateral and Bilateral Vestibular Hypofunction

Evidence Quality- Level V

Recommendation Strength- Expert Opinion

- Reasons for stopping therapy
  - Goals met
  - Plateau reached
  - Non-adherence
  - Prolonged increase in symptoms
  - Fluctuation or unstable vestibular symptoms
- Worsening symptoms in first 1-2 weeks should not be a reason for stopping
- On basis of expert opinion, advisory panel recommends before stopping therapy for patients who remain symptomatic or have not met goals, consult with another vestibular therapist

# Action Statement

## Action Statement 8 (continued)

- Unilateral Hypofunction - 1x/wk for 2-6 weeks
- Bilateral Hypofunction- 1x/wk for 8-12 weeks

# Action Statement

## Action Statement 9: Factors that Modify Rehabilitation Outcomes

Evidence Quality/Recommendation Strength: Age-Level I(Strong), Gender- Level III (Weak), Time from Onset- Level II (Moderate), Comorbidities- level III (Weak), Use of Vestibular Suppressant Medication-Level II-III (Moderate)

- Age does not affect potential for improvement
- Gender may not impact rehabilitation outcomes; expectation of similar outcomes
- Time from onset (Acute)- earlier intervention improves rehabilitation outcomes
- Time from onset (Chronic)- improved outcomes regardless from time of onset, however, the potential for harm related to decreased quality of life or falls suggests that clinicians may initiate rehabilitation as soon as possible
- Comorbidities- Anxiety, migraine and peripheral neuropathy may negatively impact rehabilitation outcomes
- Vestibular suppressant medications - long term use of valium or meclizine may negatively impact patient recovery

# Action Statement

Action Statement 10: The Harm/Benefit Ratio for Vestibular Rehabilitation in Terms of Quality of Life/Psychological Stress

Evidence Quality: Level I-III

Recommendation Strength: Strong

- Quality of life reported to improve post-vestibular rehabilitation for persons with unilateral vestibular hypofunction
- Anxiety and depression were associated with lower balance confidence scores
- Emerging evidence that psychological distress and anxiety are decreased with vestibular rehabilitation
- Research should examine the concept of return to work

# Guideline Implementation Recommendations

- Keep a copy of the CPG in a convenient clinic location
- Seek training in use of the recommended intervention approaches
- Build relationships with referral sources to encourage early referral
- Measure outcomes of care using recommended outcome measures
- Utilize educational materials from article

# Clinical Practice Guidelines: Concussion

- Published in Journal of Orthopedic and Sports Physical Therapy April of 2020
  - Utilized studies available through Dec. 31, 2018
- Recommendations for ages 8 and older with no more than mild cognitive impairment
- Guidelines divided into 3 areas
  - Screening and Diagnosis
  - Examination
  - Interventions

# Strength of Evidence/Grades of Recommendation

- Strength of Evidence Levels I-V
- Grades of Recommendation A-F
  - A= strong evidence
  - B= moderate evidence
  - C= weak evidence
  - D= conflicting evidence
  - E= theoretical/foundational
  - F= expert opinion



# Screening and Diagnosis

- Screening should occur for all individuals who have experienced a potential concussive event
  - Brain injury
  - C-spine injury
  - Other medical conditions
- Comprehensive intake interview
  - Past medical history
  - Review of mental health history
  - Injury related mechanism
  - Injury related symptoms
  - Early management strategies
- Differential Diagnosis
  - PT should evaluate considering medical history and potential differential diagnosis for patients with undiagnosed concussion (A), diagnosed concussion (A), and concussive event without symptoms (F)

# Examination

- Systems to be examined (multisystem physical therapy exam)
  - Cervical/Musculoskeletal
  - Vestibulo-oculomotor
  - Autonomic/Exertional Tolerance
  - Motor Function
  - Need for additional referrals
  - Factors that may influence recovery process

# Intervention

- Evidence indicates that physical therapy early after concussion is safe and may facilitate a faster recovery
- Education
  - Self-management of symptoms
  - Importance of relative rest instead of strict rest
  - Progressive re-engagement in activities
  - Importance of sleep
  - Safe return to activity pacing strategies
  - Potential signs and symptoms of need for follow-up care

# Intervention

- **Cervical**
  - Few studies dedicated specifically to this treatment area following concussion
  - Several studies indicate C-spine intervention with concussion respond well with PT
    - Neck strength/Endurance/ROM
    - Muscle strength imbalances
    - Pain assessment
    - Joint position error or cervical proprioception
  - Recommendation to use best practice standards including neck pain CPG
- **Vestibulo-oculomotor**
  - Screen for BPPV
  - Screen for Vestibular Hypofunction
  - In the absence of BPPV or evidence of vestibular hypofunction
    - Implementation of individualized vestibular and oculomotor rehabilitation plan
      - Habituation (visual and body motion)
- **Exertional Tolerance and Aerobic Exercise**
  - Linked to faster symptom resolution and rate of return to sport and enhanced neurologic recovery (studies 4-6 weeks post-injury)
  - Reduce risk for deconditioning
  - Promote functional brain healing
  - Non-pharmacological option to improve mental health

# Intervention

- Motor Function

- Should implement motor function interventions to address identified or suspected motor function impairments
- Might include
  - Static balance
  - Dynamic balance
  - Motor coordination and control
  - Dual/multi-tasking

# Intervention

- Monitoring and Progressing Patients
  - Document patient symptoms
    - May change as they reintegrate and introduce new activities into their daily routines
    - Utilize self-report outcome scales/measures
  - Reassess movement-related impairments
  - Administer outcome measures