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**Module 2 – Evidence for Treatment**

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Dizziness as a Complaint in Geriatrics – Option 1

Dizziness and the Geriatric Population

As an individuals age, they become more susceptible to dizziness.1 This susceptibility risk is due to the anatomic and physiologic changes that occur with the normal aging process, such as a reduction in sensory receptions located in the semicircular canals, saccule utricle, proprioceptive end organs and retina.1 Additionally, older adults often experience a decline in function of their vision and visual-vestibular reflexes.1 This is detrimental as adults and older adults rely substantially on vision to compensate for vestibular and postural control deficits. Therefore, a decline in vision often correlates with dizziness and imbalance in geriatric populations.1

Dizziness is understood to be a geriatric syndrome, and argued to be provoked by multiple underlying conditions or factors.2 Ahern et al. note that dizziness is reported in over 30% of individuals above the age of 65, with a high incidence of benign paroxysmal positional vertigo (BPPV) and peripheral vestibular impairment (PVI) in elderly populations.4 In a retrospective study by Kao et al., seven independent factors for dizziness were identified in 262 patients over the age of 65.5 These factors include: depressive symptoms, cataracts, abnormal balance or gait, postural hypotension, diabetes, past myocardial infarction, and the use of three or more medications.5 Of note, the authors of this study found that the incidence of dizziness corresponded strongly to patients with higher numbers of these risk factors.5 These collective findings support the notion that causes for dizziness in geriatric populations are multiple and highly complex. Therefore, several studies have supported that dizziness in older adults be approached as both a symptom and as a syndrome.2,4,6

Postural stability relies on the integration of visual, proprioceptive, somatosensory, and vestibular input.1 Therefore, a disturbance or pathology to one of these systems often contributes to a sense of dizziness, instability and disorientation.1 A structured history intake and clinical examination are extremely important elements in determining the cause of dizziness in geriatric populations. Salles et al. describe four categories of dizziness most commonly encountered in geriatric populations, including: vertigo, pre-syncope, disequilibrium, and unspecified dizziness.6 Differences in manifestation and pathophysiology are observed for these differing categories of dizziness.6

Pathophysiology and Manifestations of Dizziness in Geriatric Populations

Vertigo is manifested as sensitivity to rotary motion which suggests disturbances of the vestibular system.6 Benign paroxysmal positional vertigo (BPPV) has been characterized by nystagmus with a short latency period that can be provoked by the Dix-Hallpike maneuver.3 This form of vertigo is believed to be due to a degenerative process involving the otoconial membrane of the utricle and saccule, resulting is a displacement of the otoconial crystals into the perilymph.3 These patients may complain of dizziness provoked by turning their head in bed, tilting their heads backwards to look up, or bending there head forward.3

Pre-syncope is often described as a feeling that loss of consciousness is imminent and is usually brought on from diffuse temporary cerebral ischemia.6 These patients may describe a “roaring” sensation in their ears. Postural hypotension falls under the presyncope category, as patients may experience postural dizziness and light-headedness after standing.3 Postural hypotension may be brought on in geriatric populations by a pooling of blood in the lower extremities, polypharmacy, or prolonged bedrest.3

A patient with disequilibrium might report a sense of postural instability, which usually results from somatosensory disturbance, such as peripheral neuropathy or a loss of unilateral or bilateral vestibular function.3,6 Loss of vestibular function may be due to side effects of an acoustic neuroma, ototoxic medications, while peripheral neuropathy is common in patients with diabetes, renal failure, or osteoarthritis of the spine.3

Unspecified forms of dizziness are commonly brought on by psychological disorders.6 Patients with psychological causes of dizziness often describe a feeling of “wooziness” with their condition.3 Findings from a study by Sloane et al. demonstrated that 37.5% of patients aged 60 and older with chronic dizziness met DSM-III criteria for psychological disorders, with anxiety disorders, adjustment reactions, and depressive disorders being the most common diagnoses.3 These patients often respond well to management program consisting of vestibular rehabilitation, antidepressants, and psychotherapy.3

Dizziness can negatively impact the quality of life in geriatric populations due to the many adverse manifestations of the condition.2 These manifestations may include anxiety, decline in function, fear of falling, and limitations of activities in everyday life.2 It is important that clinicians understand the manifestations and pathophysiology of dizziness, as dizziness significantly increases the risk of falls in elderly populations.7 Findings from a study by Herdman et al. convey that approximately half of patients with vestibular disease report a fall, and half of that group report more than one fall in the past year.7 Additionally, a large study of older patients demonstrated that dizziness was directly associated with 6.4 to 7.2% of falls.8 Falls are an all too common occurrence in community dwelling elderly individuals, and those who do fall are at a higher risk for various negative outcomes such as fracture, disability, and even death.9

Rehabilitation for the Dizzy, Geriatric Patient

Treatment and rehabilitation efforts should be specific to the underlying cause of dizziness in geriatric populations.2 Vestibular rehabilitation in older adults with dizziness has demonstrated to be effective in increasing stability, reducing the risk of falls, and improving gait, balance, and restoring the ability to participate in activities of daily living. 10 Several clinical studies recommend that vestibular suppressants should only be utilized for acute vertigo episodes, and if they are used, they should be used at the lowest possible dose for the shortest possible time.2,5,6 This is due to the concern that these medications may inhibit the brain’s ability to compensate for vertigo over time.*2* Current recommendations for BPPV include canalith repositioning maneuvers and vestibular rehabilitation.2 The Epley maneuver is a canalith repositioning maneuver aimed to reposition canaliths in the posterior semicircular canal and has a success rate of nearly 90% in BPPV cases, regardless of age.2,3 Additionally, habituation exercises are often utilized as a treatment intervention for patients with vertigo, as provoking the symptoms of dizziness and vertigo will help the central nervous system attenuate the vertigo response.1,3,6 Habituation exercises are generally repeated until they are no longer tolerated by the patient, with the aim of increasing the number of repetitions over a 6- to 8-week period of time.1

Geriatric patients diagnosed with a loss of vestibular function would likely benefit from a vestibular rehabilitation program consisting of gaze stabilization, habituation, balance, and posture exercises.1 Gaze stabilization interventions, such as VOR x 1 and VOR x 2, promote central nervous system adaptation through exercises that stimulate the vestibular ocular reflex.1 Gaze stabilization adaptation exercises are believed to enhance vestibular function by promoting neuroplastic change within the central nervous system.1 Examples include focusing on an object or reading text while performing head movements at varying speeds and durations. Balance training is another method to stimulate central nervous system adaptation and help alleviate symptoms of dizziness and unsteadiness.1 Most balance training interventions challenge’s the individuals balance system by progressively decreasing their base of support or modifying their support surfaces.1 Having a patient standing in single-leg or tandem stance, or walk on foam surfaces are examples of exercises that would likely challenge a geriatric patient’s balance system and promote neuroplastic change.1 Balance adaptation can be further promoted by removing the patient’s visual input during the exercises, such as having the patient perform static and dynamic exercises with their eyes closed as tolerated. Additionally, balance rehabilitation may also include muscle strengthening exercises, proprioceptive neuromuscular facilitation, coordination exercises, and transfer training.6

If a geriatric patient’s dizziness is contributed to presyncope or postural hypotension, the underlying physiologic problem should be addressed.3 This may include providing information to patients on how to avoid the onset of hypotension- such as educating patients to sit on the edge of their bed and perform ankle pumps before standing, or preventing blood pooling into the lower extremities by wearing elastic stockings.3

Clinical Relevance

When interacting with geriatric patients with complaints of dizziness, clinicians must be skilled differential diagnosticians, as many life-threatening diagnoses, such as stroke or myocardial infarction, often present dizziness as a symptom.2 The patient’s specific historical features, including the frequency, tempo, onset, and triggers of their dizziness symptoms are useful factors for physical therapists to consider when determining an appropriate plan of care or a possible need for referral.2

Physical therapists should be aware that many geriatric patients presenting with dizziness often are experiencing compounding effects, such as increased anxiety, fear of falling, and limitations in activities of everyday life.2 Therefore, clinicians should strive to establish trust with these patients, and make relevant modifications to the patient’s plan of care for their individual needs. For example, modifications in diagnostic positioning may be necessary for a elderly patient who is unable to lie prone. The Side-Lying maneuver has demonstrated to a reliable alternative maneuver for patients unable to complete the Dix-Hallpike positioning.2 Additionally, some patients may be averse to habituation exercises due to the inducement of dizziness. In these cases, patient education and compensation strategies should be promoted by the therapist. To determine if the rehabilitation program is effective in diminishing symptoms of dizziness, clinicians may choose to utilize subjective measures, such as the Dizziness Inventory Handicap Questionnaire, to track patient progress.6

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