Clinical Practice Guideline and Pathways for the Evaluation and Management of Patients with Dizziness in Family and Community Practice

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Background: Dizziness is a commonly encountered symptom in the primary care which can be caused, most of the time by benign condition and rarely due to serious conditions needing higher level of care.

Objective: To develop a clinical guideline and pathway that will serve as guide in the diagnosis and management of adult patients with dizziness in primary care and outpatient setting.

Methods: A guideline development team was formed which is composed of family and community medicine specialists from different institutions. Searching, selection and assessment of the latest evidence on dizziness diagnosis and management was done using the search terms: "dizziness", "diagnosis", "management", and "primary care". Formulation of the recommendation was done using Grade approach and graded with modified GRADEPro and expert panel consensus. External review was also done by an expert in otorhinolaryngology.

Recommendations

Clinical Assessment

- Recommendation 1. Ask for the patient's description of dizziness and classify the patient into one of the four types: vertigo, presyncope, disequilibrium, and lightheadedness and classify as acute/episodic or chronic/sustained. (Strong Recommendation, Low Quality Evidence)
- Recommendation 2. Obtain a medical history focusing on the timing, triggers, associated symptoms, risk factors for atherosclerotic vascular disease, and functional status or quality of life. (Strong Recommendation, High Quality Evidence)
- Recommendation 3. Perform a physical examination focusing on vital signs, HEENT (including otoscopy), cardiovascular and neurologic examination. (Strong Recommendation, High Quality Evidence)
- Recommendation 4. Perform special physical examinations like Dix-Hallpike maneuver for acute episodic triggered vertigo to check for BPPV (most common cause of peripheral vertigo), HINTS plus test for spontaneous episodic vertigo to check for stroke and hyperventilation provocation test for patients suspected of anxiety (Strong Recommendation, High Quality Evidence)
- Recommendation 5. Elicit red flags that should warrant referral like severe dizziness and associated, altered mental status, loss of consciousness and abnormal vital signs. Other symptoms like chest pain, palpitations, dyspnea, neurologic deficit may warrant referral for evaluation and management. (Strong Recommendation, High Quality Evidence)
- Recommendation 6. For patients consulting via telemedicine, obtain a medical history focusing on the timing, triggers, associated symptoms, risk factors for atherosclerotic vascular disease, and functional status or quality of life, and observe and conduct self-physical examination (vital signs, mental status, ocular and facial nerve) (Strong Recommendation, Low Quality Evidence)

Diagnostic

- Recommendation 7. Laboratory testing is not routinely recommended among patients with dizziness. However, testing may be requested if there is a need to identify a definite etiology to guide treatment and should be guided by the classification of dizziness, possible etiology, and the medical history and physical examination. (Strong Recommendation, High Quality Evidence)

- Recommendation 8. For patients with vertigo and with auditory symptoms (i.e., hearing loss, tinnitus and aural fullness, etc.), pure tone audiometry speech test may be requested if available. (Strong Recommendation, High Quality Evidence)
- Recommendation 9. For patients with presyncope/syncope and a chronic medical condition is being considered, complete blood count may be requested for those with probable blood dyscrasia, serum blood glucose may be requested for those with diabetes, electrocardiogram and lipid profile may be requested for those with cardiovascular disease. (Strong Recommendation, High Quality Evidence)
- Recommendation 10. For patients with disequilibrium and with an abnormal neurologic physical examination finding, CT scan may be requested. (Strong Recommendation, High Quality Evidence)

Pharmacologic

- Recommendation 11. Empiric trial of short course (7 days) pharmacologic treatment for symptom relief should be offered. Referral should be considered if the dizziness become more severe or it did not improve in 7 days. (Strong Recommendation, High Quality Evidence)
- Recommendation 12. For patients with mild to moderate vertigo, offer histamine analogue (betahistine) or antihistamine (meclizine, diphenhydramine, dimenhydrinate or cinnarizine) for symptom relief. (Strong Recommendation, High Quality Evidence)
- Recommendation 13. For patients with mild to moderate vertigo associated with migraine (vestibular migraine), aside from symptom relief, offer any of the triptans as preventive medication. (Strong Recommendation, High Quality Evidence)
- Recommendation 14. For patients whose dizziness is described as disequilibrium (gait imbalance) or presyncope (near faintness) or dizziness with anxiety attack, offer symptomatic treatment and intervention based on the underlying cause or consider referral to appropriate specialist. (Strong Recommendation, High Quality Evidence)

Non-pharmacologic

- Recommendation 15. All patients should be provided with health education on causes, triggers and follow up. (Strong Recommendation, Low Quality Evidence)
- Recommendation 16. All patients should be advised on appropriate diet and lifestyle modification. (Strong Recommendation, Low Quality Evidence)
- Recommendation 17. Depending on the nature of vertigo, educate and train the patient on canal repositioning maneuver and vestibular rehabilitation. Referral to rehabilitation medicine may be considered. (Strong Recommendation, High Quality Evidence)
- Recommendation 18. The patient's family must also be provided with health education and identify a caregiver to assist and promote compliance to management. (Strong Recommendation, Low Quality Evidence)
- Recommendation 19. Encourage community-based vestibular rehabilitation activities such as group balance training exercise. (Strong Recommendation, Low Quality Evidence)

Patient Outcomes

- Recommendation 20. The patient should know the nature of dizziness, causes and potential complications and develop skills in postural exercises. (Strong Recommendation, Moderate Quality Evidence)
- Recommendation 21. Decrease in frequency and severity should expected within 48 hours and resolution is expected within a month. (Strong Recommendation, Moderate Quality Evidence)
- Recommendation 22. Improved quality of life should also be elicited. (Strong Recommendation, Moderate Quality Evidence)
- Recommendation 23. Referral to appropriate specialty should be done if no resolution or progression of symptoms or impaired quality of life for more than a month. (Strong Recommendation, Expert Opinion)

Implementation

The committee shall disseminate the guidelines through presentations and via journal publications. The QA committee shall be in charge of implementation of the guideline and pathway.

Introduction

Dizziness is defined as an illusion of movement of self or of the environment, and it can be described into four major categories: 1) vertigo / rotatory, 2) disequilibrium, 3) lightheadedness and 4) presyncope.[1] It is a commonly encountered symptom among patients seen in the primary care setting with a lifetime prevalence estimate of 17 to 30%.[2] Primary care practitioners are the first contact within the healthcare system, where they see at least half of patients who present with dizziness.[3] A primary complaint of dizziness accounts for 5.6 million clinic visits per year.[4] It is one of the most challenging symptoms encountered in the primary care setting and physicians are often faced with difficult decisions when evaluating and managing patients with dizziness. It is difficult to define, impossible to measure, a challenge to diagnose, and troublesome to treat. Dizziness can be caused by a wide range of benign and serious conditions. The most common etiologies of dizziness are vestibular/peripheral, benign positional vertigo, vestibular neuritis, Meniere's disease, cardiovascular disease, neurological disease, psychogenic, and no clear diagnosis in some patients.[5]

Dizziness can cause considerable morbidity and utilization of health services resulting to increased direct cost. One major driver of direct health care costs may be the overutilization of imaging procedures, which actually would have a well-defined but limited role in differentiating vestibular disease from rare but life-threatening conditions such as stroke. In the absence of clinical pathways, imaging is used as an easy solution; in contrast, low-cost examination techniques such as the head impulse test seem to be underutilized.[6] Indirect costs, specifically with vertigo, can be a reason for sick leave and occupational disability where 50%, their work efficiency dropped, 25% changed their jobs and 21% quit their work.[7] Loss of quality of life from vestibular disease also result to economic burden per patient especially the elderly.[8]

Treatment of dizziness depends on its underlying cause. For patients presenting with serious conditions such as central causes of dizziness like stroke, referral to tertiary hospital should be done. The purpose of this guideline and pathway is to improve quality of care and outcomes for Dizziness by improving the accuracy of diagnosis and reducing inappropriate use of ancillary tests and reducing inappropriate medications.

Scope and Purpose

This clinical practice guideline and clinical pathway is intended for the diagnosis and management of acute dizziness among adults, 18 years and above, encountered in the outpatient or primary care setting. The clinical pathway is intended to be used by family and community medicine practitioners and primary care physicians who are taking care of adult patients with dizziness for patients in the outpatient setting. The recommendations are also intended for policy makers who develop standards of care to improve the quality of care among patients with dizziness.

Objectives

The objective of this guideline was to provide evidence-based recommendations for the diagnosis and management of adult patients with dizziness in the primary care setting or outpatient setting. The general clinical questions that will be addressed with recommendations were generally grouped with into the following:

1. What is the primary care approach in the clinical assessment of adult patients presenting with dizziness?
2. Among adult patients with dizziness, what are the diagnostic procedures to be requested?
3. Among adult patients with dizziness, what are the recommended patient centered pharmacologic interventions?
4. Among adult patients with dizziness, what are the recommended patient centered non pharmacologic interventions?
5. Among adult patients with dizziness, what are the expected outcomes of the patient undergoing evaluation and treatment?

Methods of Development

Development Team

Technical Working Group and Consensus Panel

The pathway and guideline development team are composed of members of the PAFP research committee that are trained family and community medicine specialists who are currently practicing and affiliated with training institutions. They are experts in the field of primary care and are a mix of private and government practitioners. All of the members underwent orientation and training on guideline development which includes searching and appraising published evidence, utilization of tools such AGREE II and GRADEPro, formulating guideline recommendations and clinical pathways and consensus development with a panel of experts. The AGREE II was used as the standard in writing the final guideline.[9]

A consensus panel was formed who are experts in the field of family and community medicine with experience of patients with dizziness in their clinical practice. The panel of experts was representative of doctors from the private and government sector and rural and urban practice settings who will be potential users of the guideline and pathway.

All members of the group have no conflict of interest except for one member who is a consultant of a pharmaceutical company. This conflict of interest was addressed by inhibiting participation in development of pharmacologic recommendation.

Formulating the Scope and Review Questions

In formulating the clinical question, the technical working group considered the previous templates of the PAFP guideline method as the baseline. Then the following were done:

- Consultation/perspective of family physicians
- Consultation/perspective of other care providers
- Consultation/perspective of patients or target population

The scope and review questions were determined by the guideline development team after discussion of the scope and practice of primary care providers. The guideline was designed to be used for adult patients

with dizziness in the primary care setting. The clinical questions were first constructed using the PICO Framework for the different sections (clinical assessment, diagnostics, pharmacologic, etc.) of the guideline. Eventually clinical questions were grouped and stated in general terms to be inclusive of all possible options available in the medical literature. The final review questions agreed to were:

1. What is the primary care approach in the clinical assessment of adult patients presenting with dizziness?
2. Among adult patients with dizziness, what are the diagnostic procedures to be requested?
3. Among adult patients with dizziness, what are the recommended pharmacologic interventions?
4. Among adult patients with dizziness, what are the recommended patient-centered non pharmacologic interventions?
5. Among adult patients with dizziness, what are the recommended family-focused non pharmacologic interventions?
6. Among adult patients with dizziness, what are the recommended community-oriented non pharmacologic interventions?
7. Among adult patients with dizziness, what are the expected outcomes of the patient undergoing evaluation and treatment?

Searching, Selecting and Appraising the Evidence

The technical working group as composed of 10 members and was divided into 5 groups according to major pathway sections: clinical assessment, diagnostics, pharmacologic, non-pharmacologic and patient outcomes. Each group was composed of at least two members who conducted a computer-based search of Medline and HERDIN databases. Studies published in English were included. The search was conducted using the terms ``dizziness" and "primary care" and combined with "AND". Other search terms used in place of "dizziness" were "vertigo" and "lightheadedness". Retrieval of articles was focused on the following type of clinical publications: clinical practice guidelines, meta-analysis, randomized and clinical trials and observational studies. Selection was done by the group after the articles were critically appraised. Assistance from a librarian was also sought to assist in the retrieval of references.

The retrieved guidelines were systematically retrieved, and their quality and validity are appraised using the Appraisal of Guidelines for Research & Evaluation (AGREE) II Instrument, which is a tool developed to assess the methodological quality of practice guidelines.9 The GRADE approach was done for synthesizing and developing recommendations.10 The different studies are then evaluated and given a grade according to study design and how it was constructed.

Formulating the Recommendation

The ADAPTE process was utilized in the development of the initial guideline and pathway recommendations where the following steps were followed: 1) definition of health questions, 2) searching, screening and appraisal of guidelines, 3) decision and selection of evidence and 4) draft guideline report was done.[11]

In the development of recommendations, the TWG prioritized the interventions that address the following outcomes i.e., decrease in severity of symptoms, resolution of symptoms and improved quality of life. Data from the articles were extracted and the evidence was then summarized and appraised based on the type of study. The recommendations were then developed by the pathway team as the initial draft.

Grading of the Recommendations

Quality of Evidence

The GRADE is a system of rating quality of evidence and grading strength of recommendations in systematic reviews, health technology assessments, and clinical practice guidelines.[10] A Modified GRADEPro was used in assessing the quality of evidence and strength of recommendations.[12] Quality of evidence was ranked as high, moderate, low and very low. For decisions on intervention, meta-analysis of RCTs and RCTs were initially graded as high quality while observational studies including metanalysis of observational studies were initially graded as low quality. For decisions on clinical assessment, observational studies were initially graded as high quality. For decisions on diagnostic tests, cross-sectional, cohort studies and meta-analysis of such studies were initially graded as high quality while case-control studies and meta-analysis of case control studies are initially graded as low quality. The quality of the evidence was downgraded if there was significant risk of bias, inconsistency, indirectness, imprecision and publication bias; while grade was upgraded when there was large effect dose, dose response, and methods of addressing confounders.

Consensus Panel

The formulated recommendations with corresponding quality of evidence were presented for consensus panel voting whether the recommendation should be adopted or not. The written recommendations were given 1 week prior to the panel voting. Orientation was given to the consensus on the process. A written vote for each recommendation was also obtained from all panel members and kept for documentation. Based on the panel vote, the recommendation was graded Strong if all the panel members (100%) voted for the adoption, Moderate if at least 80% of the panel voted for the adoption and Weak if majority but less than 80% voted for the adoption of the recommendation.

The Consensus panel voting lasted for 2 sessions of 2-3 hours each. The guideline development team presented the summary of evidence of each of the recommendations. The consensus panel were allowed to give comments, ask questions, and give suggestions on the recommendations.

External Review and Updating

External review of the guideline and pathway was obtained from representative expert from specialty societies that also deal

with patients presenting with dizziness. An external expert from the Philippine Society of Otolaryngology-Head and Neck Surgery reviewed and gave comments and suggestions on the initial draft of the guideline. The guideline will be updated after 3-5 year as this is the appropriate time that the pathway team considers for development of new studies and probably new evidence with regards to dizziness.

Recommendations

Clinical Assessment

Recommendation 1. Ask for the patient's description of dizziness and classify the patient into one of the four types: vertigo, presyncope, disequilibrium, and lightheadedness and classify as acute/episodic or chronic/sustained. (Strong Recommendation, Low Quality Evidence)

Recommendation 2. Obtain a medical history focusing on the timing, triggers, associated symptoms, risk factors for atherosclerotic vascular disease, and functional status or quality of life. (Strong Recommendation, High Quality Evidence)

Recommendation 3. Perform a physical examination focusing on vital signs, HEENT (including otoscopy), cardiovascular and neurologic examination. (Strong Recommendation, High Quality Evidence)

Recommendation 4. Perform special physical examinations like Dix-Hallpike maneuver for acute episodic triggered vertigo to check for BPPV (most common cause of peripheral vertigo), HINTS plus test for spontaneous episodic vertigo to check for stroke and hyperventilation provocation test for patients suspected of anxiety (Strong Recommendation, High Quality Evidence)

Recommendation 5. Elicit red flags that should warrant referral like severe dizziness and associated, altered mental status, loss of consciousness and abnormal vital signs. Other symptoms like chest pain, palpitations, dyspnea, neurologic deficit may warrant referral for evaluation and management. (Strong Recommendation, High Quality Evidence)

Recommendation 6. For patients consulting via telemedicine, obtain a medical history focusing on the timing, triggers, associated symptoms, risk factors for atherosclerotic vascular disease, and functional status or quality of life, and observe and conduct self-physical examination (vital signs, mental status, ocular and facial nerve) (Strong Recommendation, Low Quality Evidence)

Evidence Review

We were able to retrieve and review 12 practice guidelines. One local guideline was published way back in 2011 and was excluded from our review. The guidelines recommended options for clinical assessment, some options for laboratory testing, pharmacologic and non-pharmacologic intervention. We also updated the recommendations from the guideline with updated search for systematic review articles on the clinical assessment of dizziness. For the clinical decision on assessment, we considered options for medical history, physical examination, clinical classification and indications for referral. The outcomes considered were arriving at an accurate clinical impression to guide laboratory testing and initial treatment.

Summary of Evidence for Classification

Dizziness is a non-specific symptom that is described differently by patients and attributed to a wide range of etiologies. Among the 15-36% of adults complaining of dizziness, more than half of which are cared for by family physicians and account for approximately 5% of family medicine visits.[14] Asking open-ended questions that allow the patient to describe his/her symptoms in his/her own words is the first and most important step in the diagnostic evaluation of dizziness, with a sensitivity of 33-87%.[15] A chronic and sustained dizziness may warrant referral for appropriate evaluation and management.

Dizziness can be broadly classified as vertigo, presyncope, disequilibrium, and lightheadedness depending on the patient's predominant description of the dizziness sensation. Vertigo refers to an illusion of motion, usually a spinning sensation. This type of dizziness is thought to originate in the inner ear labyrinth or its neural connections. It is a commonly experienced symptom and can cause significant problems with carrying out normal activities. In contrast, non-vertiginous types of dizziness may refer to disequilibrium ("gait imbalance") that may suggest a neurologic disorder, or lightheadedness ("non-specific dizziness") that may suggest an underlying psychiatric disorder or a multi-sensory dysfunction or presyncope ("near faintness") that may suggest a cardiovascular or metabolic disorder.[16] However, these four classes are not mutually exclusive, and some disease etiologies may be associated with more than one description.[17]

Table 1. Classification of dizziness according to patients descriptions*

Types of dizziness (%)	Definitions and common patient descriptors	Common differential diagnoses
Vertigo (45-54%)	Illusion of motion, either as self-motion or motion of the environment, commonly experienced as a spinning sensation	BPPV, Meniere's disease, vestibular neuritis, labyrinthitis, vestibular migraine, posterior circulation stroke
Disequilibrium (gait imbalance) (~16%)	Sense of imbalance that occurs primarily when walking	Stroke, Parkinson's disease, peripheral neuropathy, cervical spondylosis, musculoskeletal disorder interfering with gait
Presyncope (near faintness) (~14%)	Prodromal symptom of fainting or feeling of impending faint, generally preceded by dimming of vision	Orthostatic hypotension, cardiac arrhythmias, vasovagal attacks, hypoglycemia, anemia
Lightheadedness (non-specific dizziness) (~10%)	Vague symptoms, possibly feeling disconnected with the environment	Hyperventilation syndrome, anxiety, depression, panic disorder, multi-sensory dizziness, systemic diseases

*Adapted from Post RE, & Dickerson LM Dizziness: A diagnostic approach. American Family Physician 2010; 82(4): 361

Summary of Evidence for Medical History

Some patients might have difficulty in adequately and consistently describing the dizziness sensation during the initial consult. Instead of solely relying on symptom description, the family physician should assess the patient's dizziness in relation to Timing, Triggers, Associated symptoms, and Targeted Examinations (TiTrATE). With respect to timing, the family physician should assess the onset, duration, evolution, pattern, and frequency of dizziness. Triggers would include actions, movements, or situations that provoke the onset of dizziness as well as possible exposures to certain medications, recent viral infections, loud noise, head trauma, or whiplash injury.[18] Family physicians should also assess for associated vestibular symptoms including hearing loss, tinnitus, ear fullness, nausea, and vomiting. Non-vestibular symptoms such as cardiovascular, neurologic, and psychiatric symptoms (anxiety and depression) should likewise be assessed in the review of systems.[17] The presence of risk factors for atherosclerotic vascular disease such as age (older than 45 years in men and 55 years in women), hypertension, diabetes, dyslipidemia, overweight or obesity, physical inactivity, smoking, and family history of premature heart disease (younger than 55 years in men and 65 years in women). A more recent meta-analysis computed for the pooled odds ratio of these risk factors i.e., female gender (OR = 1.42; 95% CI 1.17-1.74; p = 0.0004), hypertension (OR = 2.61; 95% CI 1.22-5.59; p = 0.01), diabetes mellitus (OR = 2.62; 95% CI 1.25-5.48; p = 0.01), hyperlipidemia (OR = 1.60; 95% CI 1.23-2.09; p = 0.0006), osteoporosis (OR = 1.72; 95% CI 1.03-2.88; p = 0.04) and vitamin D deficiency (MD = - 3.29; 95% CI - 5.32 to - 1.26; p = 0.001).[19] These factors should prompt the family physician to consider critical cardiovascular and other etiologies of dizziness such as arrhythmias, myocardial infarction, carotid artery stenosis, stroke, and transient ischemic attack.[20]

In addition to diagnosing the etiology of dizziness, family physicians should assess for factors that may negatively affect the patient's safety, activities of daily living, or quality of life such as impaired mobility or balance, risk for fall, and availability of psychosocial support.[4] This is particularly important among the elderly because they are at high risk for falls, functional disability, institutionalization, and even death. The assessment and management of dizziness in older patients are challenging because their dizziness sensation is often vague and attributed to a variety of conditions including multiple sensory defects (e.g. hearing impairment; visual impairment due to cataracts; impaired balance due to osteoarthritis or peripheral neuropathy; physical deconditioning), myocardial infarction, cerebrovascular disease, postural hypotension, polypharmacy (five or more medications), and even anxiety and depression.[15]

Summary of Evidence for Physical Examination

The physical examination may be guided by the pneumonic SNOOP i.e., systemic, neurologic, otologic, ophthalmic and psychiatric examination. The systemic physical examinations should include vital signs, orthostatic blood pressure measurement, cardiac auscultation and pulse palpation. Blood pressure should be measured in supine position and in standing position after one minute to observe for postural changes in measurement. Orthostatic hypotension is present when systolic blood pressure decreases by at least 20mmHg, diastolic blood pressure decreases by at least 10mmHg, or pulse rate increases by at least 30 beats per minute.[3]

Neurologic examination should be performed among patients presenting with disequilibrium or positional dizziness but test negative for orthostatic hypotension or Dix-Hallpike maneuver.[20] The family physician should at least evaluate for level of consciousness, cranial nerve function including visual acuity, sensorimotor function and reflexes, cerebellar function (i.e., rapid alternating movements, finger-to-nose test, heel-to-shin test), gait and posture, and Romberg's test.[14] Swaying toward one side on Romberg's test is suggestive of ipsilateral vestibular dysfunction. Ataxia and wide-based, irregular gait is indicative of cerebellar dysfunction. Slow, shuffling gait and reduced arm swing can be seen in early Parkinson's disease which progresses to freezing and hesitation in later stages.[17] Likewise, patients with unsteady gait, postural instability, or a positive Romberg's test should be further evaluated for peripheral neuropathy. In any case, patients with acute-onset focal neurologic deficits should be urgently referred to the emergency room for stroke evaluation and management.[20]

Routine otoscopy may reveal frank etiologies of dizziness such as impacted cerumen, otitis media, herpes zoster, and cholesteatoma. Tuning fork tests, whisper test, and finger rub test may reveal unilateral hearing loss associated with Meniere's disease or labyrinthitis.20 Nystagmus is quick, jerky, involuntary eye movements that are highly suggestive of vertigo. A few beats of bilateral symmetric

Table 2. Medications that might cause dizziness.

Causal Mechanism	Medications
Cardiac effects: hypotension, postural hypotension, torsades de pointes, other arrhythmias	Alcohol, antiarrhythmics (class 1a), antidementia agents, antiepileptics, antihistamines (sedating), antihypertensives, anti-infectives, antiparkinsonian agents, ADHD agents, digitalis glycosides, dipyridamole, narcotics, nitrates, PDE-5 inhibitors, skeletal muscle relaxants, SGLT-2 inhibitors, urinary anticholinergics
Central anticholinergic effects	Skeletal muscle relaxants, urinary and gastrointestinal antispasmodics
Cerebellar toxicity	Antiepileptics, benzodiazepines, lithium
Hypoglycemia	Antidiabetic agents, beta-adrenergic blockers
Ototoxicity	Aminoglycosides, antirheumatic agents
Bleeding complications	Anticoagulants
Bone marrow suppression	Antithyroid agents

*Adapted from Post RE, & Dickerson L M. Dizziness: A diagnostic approach. American Family Physician 2010; 82(4): 361.

Table 3. Timing, triggers and associated symptoms for common etiologies of dizziness.

TIMING	TRIGGER (OR EXPOSURE)	ASSOCIATED SYMPTOMS (AND RISK PROFILE)	DIAGNOSIS
Episodic, (seconds to minutes)	Postural changes, standing from seated or supine position	Lightheadedness, imbalance, confusion, syncope	Orthostatic hypotension
Episodic, (seconds, fatigable)	Head turning and rolling in bed, possible prior head trauma	Nausea, no associated ear symptoms	Benign positional paroxysmal vertigo (BPPV)
Episodic, (20 minutes to several hours)	Spontaneous	Nausea, vomiting, unilateral tinnitus, aural fullness, or hearing loss	Meniere's disease
Episodic, (minutes to hours)	Migraine triggers: stress, fatigue, weather, and food	Headache, head motion intolerance, photophobia, phonophobia	Vestibular migraine
Episodic, (fluctuating severity)	With ambulation, may worsen on uneven surfaces	Lightheadedness	Multi-sensory dizziness
Episodic, (days, fluctuating severity)	Spontaneous, associated with viral infection (reactivation of HSV-1)	Nausea, vomiting, unilateral hearing loss (only for labyrinthitis)	Vestibular neuronitis (and labyrinthitis)
Continuous, lasting minutes to hours	Spontaneous	Headache, confusion, vomiting, ataxia, diplopia, dysarthria, dysphagia, paresthesia Associated with atherosclerosis	Transient ischemic attack
Continuous, lasting minutes to hours, and may worsen	Spontaneous, severe symptoms at onset	Headache, confusion, vomiting, ataxia, diplopia, dysarthria, dysphagia, paresthesia Associated with atherosclerosis	Stroke

*Adapted from Wu V, Beyea M M, Simpson MTW & Beyea JA. Standardizing your approach to dizziness and vertigo. J Fam Pract 2018; 67(8): 490–8.

horizontal nystagmus on lateral gaze are physiologic but asymmetric or excessive beats are pathologic. Although some forms of nystagmus are spontaneous and readily visible, others can only be seen after a provocative maneuver.[15] The most established of which is the Dix-Hallpike maneuver which should be performed on patients presenting with positional dizziness, especially if the timing and trigger are consistent with BPPV. Before performing the maneuver, the patient should be informed that it may induce vertigo. If the patient consents to proceed, he/she is assisted to sit on the bed and the family physician turns the patient's head 30-45 degrees to the side being tested. The patient is instructed to keep their eyes open and focus on a stable point and then assisted to quickly lie supine and hyperextend the neck so that the head hangs over the edge of the bed. The patient is maintained in this position and observed for nystagmus for 30 seconds. Latent, geotropic, torsional nystagmus confirms the diagnosis of posterior canal BPPV on the side to which the head is turned.[3]

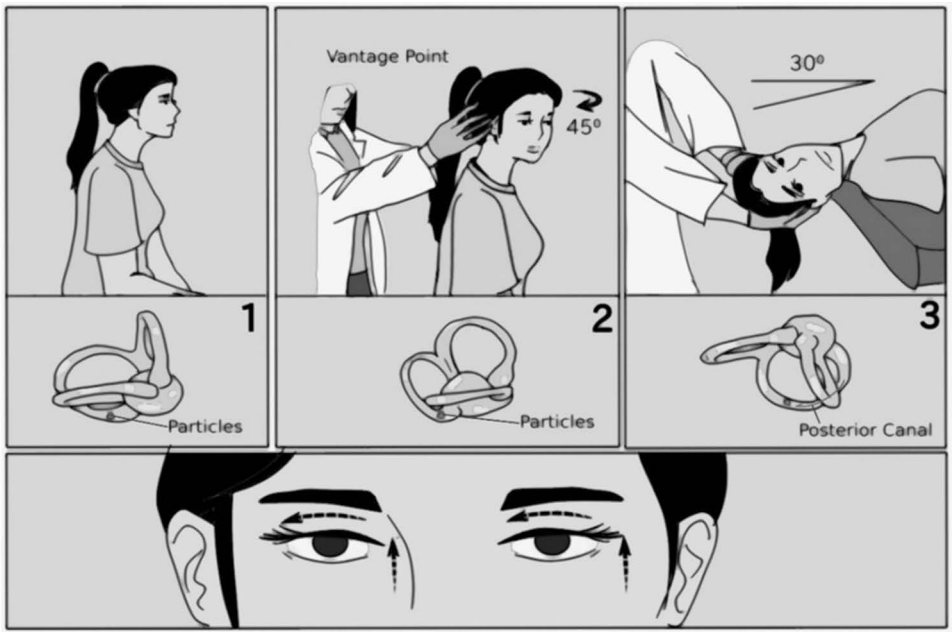


Figure 1. Dix hallpike maneuver
(Source: https://www.123rf.com/photo_152963561_dix-hallpike-maneuver-vector-illustration.html)

The nystagmus assessment, head impulse and test of skew (HINTS) can aid in distinguishing etiologies of peripheral vertigo such as vestibular neuritis from central vertigo such as brainstem or cerebellar ischemia. The HINTS examination is a three-step oculomotor examination that is more accurate than early MRI diffusion-weighted imaging in diagnosing stroke among patients presenting with acute vestibular syndrome (i.e., continuous spontaneous vertigo for at least 24 hours), with a sensitivity of 100% and a specificity of 96%. Head Impulse: While the patient is sitting, the head is thrust 10 degrees to the right and then to the left while the patient's eyes remain fixed on the examiner's nose. If a saccade (rapid movement of both eyes) occurs, the etiology is likely peripheral. No eye movement strongly suggests a central etiology. Nystagmus: The patient should follow the examiner's finger as it moves slowly left to right. Spontaneous unidirectional horizontal nystagmus that worsens when gazing in the direction of the nystagmus suggests a peripheral cause. Spontaneous nystagmus that is dominantly vertical or torsional, or that changes direction with the gaze suggests a central etiology. Central pathology nystagmus changes direction less than half the time and can be suppressed with fixation. Test of Skew: Ask the patient to look straight ahead, then cover and uncover each eye. Vertical deviation of the covered eye after uncovering is an abnormal result. Although this is a less sensitive test for central pathology, an abnormal result is fairly specific for brainstem involvement.[3] Hyperventilation provocation test (i.e., 20 cycles of rapid inhalation and exhalation to trigger dizziness) and further psychiatric evaluation may be warranted among patients presenting with lightheadedness consistent with hyperventilation syndrome and anxiety or depression, respectively.[17]

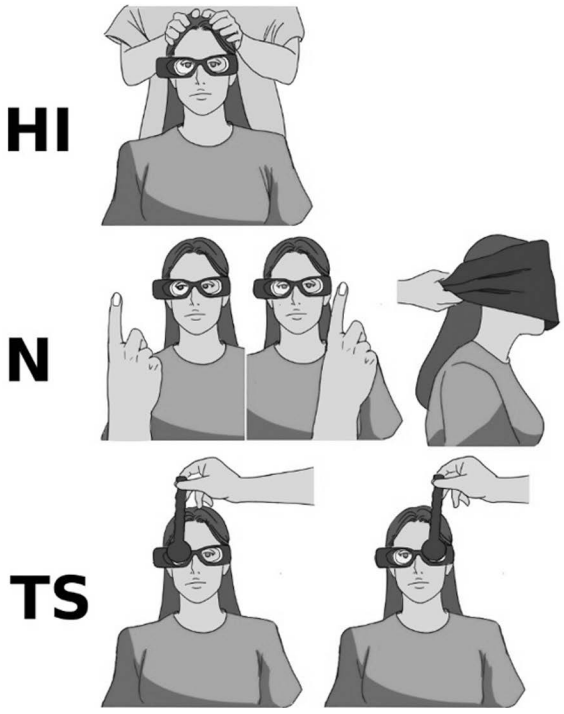


Figure 2. HINTS examination.
(Source: https://www.researchgate.net/figure/Performance-of-the-three-step-HINTS-test-battery-HI-head-impulse-test-N-nystagmus_fig1_358534043)

Summary of Evidence for Red Flags

After conducting a focused history-taking and physical examination, the family physician may be able to identify prominent symptoms or findings that may require specialist referral or triage to the emergency department for further evaluation and management. Patients presenting with chronic and sustained dizziness may warrant referral. Those with new, acute dizziness (i.e., onset within the past few minutes to hours) associated with headache, loss of consciousness, falls, or sensorimotor disturbances of the face or extremities should be referred to the emergency department for in-person evaluation and neuroimaging, to avoid the life-threatening or severe sequelae of stroke.[21] Patients presenting with central vertigo are recommended specialist or emergent referral for further investigation, especially those with associated neurologic deficits and risk factors for atherosclerotic vascular disease.[20]

Summary of Evidence for Telemedicine

Best practices for telemedicine consultations of patients complaining of dizziness are yet to be defined. As much as possible, the

Table 4. Red flags among patients with dizziness[18]

Symptom or finding	Possible differential diagnoses
Altered mental status	Wernicke's encephalopathy; stroke; encephalitis; seizure; intoxication with alcohol, illicit drugs, carbon monoxide; hypertensive encephalopathy
Transient loss of consciousness or unwitnessed fall	Arrhythmia; acute coronary syndrome; aortic dissection; pulmonary embolism; vasovagal syncope; hypovolemia; stroke; subarachnoid hemorrhage; seizure; carotid artery stenosis
Headache	Stroke; craniocervical vascular dissection; meningitis; carbon monoxide exposure; vestibular migraine; high or low intracranial pressure; subarachnoid hemorrhage
Neck pain	Craniocervical vascular dissection (vertebral artery)
Chest or back pain	Acute coronary syndrome; aortic dissection
Abdominal or back pain	Ruptured ectopic pregnancy; aortic dissection
Dyspnea	Pulmonary embolism; pneumonia; anemia
Palpitations	Arrhythmia; vasovagal syncope; panic disorder
Bleeding or fluid losses	Hypovolemia; anemia
New or recent medication use (including illicit drugs)	Medication side effects or toxicity
Fever or chills	Systemic infection; acute bacterial labyrinthitis; encephalitis; mastoiditis; meningitis
Abnormal glucose	Symptomatic hypoglycemia, diabetic ketoacidosis
Focal neurologic deficit	Stroke; transient ischemic attack; cerebellar or brainstem tumor
Ear pain or discharge	Acute otitis media; acute bacterial labyrinthitis
Central vertigo	Vestibular migraine; acute cerebellar infarction, chronic cerebrovascular disease, vestibular Schwannoma, multiple sclerosis, infection
Vomiting	Vestibular neuronitis

family physician should obtain a detailed medical history and perform a thorough physical examination, as previously described. However, the physical examination may be limited to vital signs, mental status, and ocular and facial nerve examinations depending on the capabilities of the telemedicine platform used and the proficiency and resources of the family physician and/or patient in performing a virtual physical examination. Vital signs may be obtained depending on the availability of peripheral devices such as a thermometer, sphygmomanometer, and pulse oximeter. A mini-mental status examination may be conducted to assess the patient's level of consciousness, mood, affect, memory, and speech. Concurrently, the telemedicine family physician may observe for facial asymmetry and voluntary contractions at rest, smooth pursuit, saccadic eye movements, spontaneous nystagmus, diplopia, or oscillopsia during the interview. Balance and gait testing remain controversial due to the risk of falls. Instead, simply asking the patient may suffice for a preliminary assessment.[22]

Diagnostic Tests

Recommendation 7. Laboratory testing is not routinely recommended among patients with dizziness. However, testing may be requested if there is a need to identify a definite etiology to guide treatment and should be guided by the classification of dizziness, possible etiology, and the medical history and physical examination. (Strong Recommendation, High Quality Evidence)

Recommendation 8. For patients with vertigo and with auditory symptoms (i.e., hearing loss, tinnitus and aural fullness, etc.), pure tone audiometry speech test may be requested if available. (Strong Recommendation, High Quality Evidence)

Recommendation 9. For patients with presyncope/syncope and a chronic medical condition is being considered, complete blood count may be requested for those with probable blood dyscrasia, serum blood glucose may be requested for those with diabetes, electrocardiogram and lipid profile may be requested for those with cardiovascular disease. (Strong Recommendation, High Quality Evidence)

Recommendation 10. For patients with disequilibrium and with an abnormal neurologic physical examination finding, CT scan may be requested. (Strong Recommendation, High Quality Evidence)

Evidence Review

The clinical practice guidelines that were reviewed were mostly about dizziness due to vertigo. The guidelines recommended options for clinical assessment, some options for laboratory testing, pharmacologic and non-pharmacologic intervention. We also updated the recommendations from the guideline with updated search for systematic review articles on the diagnostic tests for the assessment of dizziness. For the clinical decision on laboratory tests, we considered options for blood examinations, biochemistry, imaging and other diagnostic tests. The outcomes considered were their accuracy in arriving at definite diagnosis.

Summary of Evidence for Diagnostic Testing

All the guidelines suggested that most patients presenting with dizziness do not require laboratory testing. It must be emphasized that in a summary analysis of multiple studies that included 4,538 patients, only 26 (0.6%) had a laboratory result that explained their dizziness.[3] But there are some conditions depending on the patient's description and classification of dizziness that may require diagnostic testing. This is true when a specific etiology is needed to be identified to guide treatment.

Three guidelines recommended that among patients with vertigo and Meniere's disease is being considered, pure tone audiometry may be requested. Cohort studies show that low tone hearing loss among patients with vertigo may indicate the onset of Meniere's disease. The hearing loss, however, does not correlate with the duration of the disease. Hearing loss in mid frequencies leading to fluctuation across all frequencies occur. Use of a self-hearing test may also facilitate diagnosis.[21]

For patients with dizziness described as presyncope/syncope, the most common etiology is vascular. This can be seen in patients with chronic medical conditions i.e., anemia, diabetes mellitus, hypertension, or other cardiovascular disease. Patients with anemia may require complete blood count, patients with diabetes may require serum glucose level measurement. Patients with symptoms suggestive of cardiac disease should undergo electrocardiography and other biochemistry measurements.[3]

Among patients with disequilibrium type of dizziness where a neurologic problem may be considered, imaging studies may be requested if there is an associated abnormal neurologic finding in the physical examination. Radiologic imaging specifically CT scan may be requested especially when the neurologic examination is not suggestive of peripheral lesions. Imaging may also be considered if there were neurologic signs and symptoms, the patient has significant risk factors for cerebrovascular accident, or when symptoms of vertigo with severe headache is present.[20]

Lightheadedness or chronic subjective dizziness may be caused by psychiatric causes such as anxiety and depression. One study mentioned that approximately 28% of patients with dizziness reported at least one symptom of anxiety disorder. Another mentioned that up to 60% of patients with chronic nonspecific dizziness have been reported to have an anxiety disorder. Depression and alcohol intoxication have also been found to overlap with dizziness. There was no recommendation for laboratory testing specifically mentioned for these cases.[17]

Pharmacologic Treatment

Recommendation 11. Empiric trial of short course (7 days) pharmacologic treatment for symptom relief should be offered. Referral should be considered if the dizziness become more severe or it did not improve in 7 days. (Strong Recommendation, High Quality Evidence)

Recommendation 12. For patients with mild to moderate vertigo, offer histamine analogue (betahistine) or antihistamine (meclizine, diphenhydramine, dimenhydrinate or cinnarizine) for symptom relief. (Strong Recommendation, High Quality Evidence)

Recommendation 13. For patients with mild to moderate vertigo associated with migraine (vestibular migraine), aside from symptom relief, offer any of the triptans as preventive medication. (Strong Recommendation, High Quality Evidence)

Recommendation 14. For patients whose dizziness is described as disequilibrium (gait imbalance) or presyncope (near faintness) or dizziness with anxiety attack, offer symptomatic treatment and intervention based on the underlying cause or consider referral to appropriate specialist. (Strong Recommendation, High Quality Evidence)

Evidence Review

We search PubMed using the terms "dizziness", "vertigo" and "practice guideline" to search for relevant recommendations on pharmacologic treatment for dizziness and vertigo. We were able to retrieve 7 practice guidelines from this. We also searched for local guidelines with assistance from a university library service and pharmaceutical partner. We were able to obtain 3 more guidelines after this search. One local guideline is available but was developed way back in 2011 and published in 2014. The guidelines recommended options for pharmacologic intervention.

Pharmacologic options for the symptomatic treatment of dizziness and vertigo include antihistamines, anticholinergics, benzodiazepines, calcium channel antagonists and dopamine receptor antagonists. These medications may modify the intensity of symptoms, or they may affect the underlying disease process. These are the pharmacologic options we considered in our review for the development of recommendations. The outcomes we expected are resolution of the symptoms, decrease in severity or improved quality of life. Avoidance of adverse events and complications were also considered.

Summary of Evidence for Symptomatic Treatment

An empirical approach to these patients incorporating trials of medications, trials of medication withdrawal, physical therapy and psychiatric consultation is suggested.[23] Our recommendation on the clinical assessment suggested to classify dizziness into 4 types i.e., vertigo, disequilibrium, presyncope and lightheadedness based on the patient's description. The initial drug treatment may be tailored for these for types. Vertigo includes disorders of the inner ear such as Ménière's disease, vestibular neuritis, benign paroxysmal positional vertigo (BPPV) and bilateral vestibular paresis. Histamine antagonists are generally recommended for this type of dizziness. Meta-analysis for this class of drug has shown effectiveness among patients with vertigo over placebo.[24]

The guidelines reviewed recommend betahistine as the initial symptomatic treatment for vertigo in general. The efficacy and safety of betahistine has been demonstrated in numerous clinical trials. It has been in the market for more than 40 years and it has been shown to have an excellent safety profile with the usual dose range from 8-48 mg daily.[25] In our updated search, we found 2 meta-analyses on the use of betahistine for the treatment of vertigo. The more recent was a Cochrane collaboration publication that included randomized controlled trials of betahistine versus placebo in patients of any age with vertigo from any etiologic diagnosis and in any settings. There were 17 studies, with a total of 1025 participants. The pooled data showed that the proportion of patients reporting an overall reduction in their vertigo symptoms was higher in the group treated with betahistine than the placebo group: risk ratio (RR) 1.30, 95% confidence interval (CI) 1.05 to 1.60. There was no difference in the frequency of adverse effects between the betahistine and placebo groups, where the rates were 16% and 15% respectively (weighted values, RR 1.03, 95% CI 0.76 to 1.40. Adverse effects (mostly gastrointestinal symptoms and headache) were common but medically serious events in the study were rare and isolated.26 An earlier meta-analysis included fewer studies and fewer patients. Similarly, betahistine was shown to be better than placebo in terms of improving the symptom of vertigo with an odds ratio of 3.52 (95% confidence interval 2.40-5.18). Sub-group analysis showed maximum efficacy after doses of 32 to 36 mg and with a period of treatment of 3-8 weeks.[27]

Vertigo with hearing problems include vestibular vertigo/neuritis or Ménière's disease. A meta-analysis on the use of betahistine for this condition was done which included 12 studies. The overall odds ratio for favorable outcome was 2.58 (95% confidence interval 1.67-3.99). The subgroup analysis for Ménière's disease, showed odds ratio of 3.37 (95% CI 2.14-5.29) while for vestibular vertigo, the odds ratio was 2.23 (95% CI 1.20-4.14) for a favorable outcome.[28] In addition to betahistine, patients with vestibular neuritis may also benefit with short-course steroid. A systematic review and meta-analysis of 8 studies showed that those given corticosteroid better recovery, however there were more reported side effects with the use of steroid.[29]

Some vertigo with inner ear problems may be more central in origin like vestibular migraine or problems in the vertebrobasilar system. Antihistamines are also effective for the treatment of symptoms in this condition. Prevention is also possible with agents like calcium channel blockers, tricyclic antidepressants and beta-blockers. A recent systematic review and meta-analysis of pharmacologic options for prevention of vestibular migraine associated vertigo included antiepileptic drugs, calcium channel blockers, tricyclic antidepressants, β-blockers, serotonin and norepinephrine reuptake inhibitors, and vestibular rehabilitation. All treatment options that were analyzed demonstrated improvement in all of the outcome parameters for dizziness and vertigo.[30]

Summary of Evidence for Lightheadedness

Psychogenic vertigo occurs in association with disorders such as panic disorder, anxiety disorder and agoraphobia. Benzodiazepines alone or in combination with antihistamines are the most useful agents here. One small randomized-controlled trial, diazepam 5mg (n=20) and meclizine 25mg (n=20) was compared in a convenience sample of adult patients with acute peripheral vertigo consulting in the emergency room. The two groups were similar with respect to patient demographics and presenting signs and symptoms. After one hour of treatment, the difference in mean improvements in the diazepam and meclizine groups were not statistically significant.[31] Another small study of 25 benign positional vertigo patients were given diazepam, lorazepam, or

a placebo over four weeks using a double-blind technique. The result showed a gradual decrease in symptoms in all treatment groups with no additional relief with the drugs.[32]

Summary of Evidence for Disequilibrium and Presyncope

Dizziness described as disequilibrium (gait imbalance) or presyncope (near faintness) are also common in family practice are also common in family practice. They approximately account for 16% and 14% of the dizziness consultation in family practice. However, they often have clearcut secondary cause. Disequilibrium or gait imbalance is often caused by neurologic etiology like stroke, Parkinson's disease or spinal cord problems. Presyncope or near faintness is often caused by chronic medical problems like diabetes, cardiovascular disease, orthostatic hypotension or anemia.[16] Their pharmacologic treatment will depend on the underlying cause.

Non-pharmacologic Treatment

Recommendation 15. All patients should be provided with health education on causes, triggers and follow up. (Strong Recommendation, Low Quality Evidence)

Recommendation 16. All patients should be advised on appropriate diet and lifestyle modification. (Strong Recommendation, Low Quality Evidence)

Recommendation 17. Depending on the nature of vertigo, educate and train the patient on canal repositioning maneuver and vestibular rehabilitation. Referral to rehabilitation medicine may be considered. (Strong Recommendation, High Quality Evidence)

Recommendation 18. The patient's family must also be provided with health education and identify a caregiver to assist and promote compliance to management. (Strong Recommendation, Low Quality Evidence)

Recommendation 19. Encourage community-based vestibular rehabilitation activities such as group balance training exercise. (Strong Recommendation, Low Quality Evidence)

Evidence Review

Non pharmacologic interventions maybe dependent on the type and causes of dizziness. The essential component of non-pharmacologic

Table 5. Pharmacologic options for symptomatic treatment of vertigo[17,21]

Drug	Dose	Expected Effect	Precaution and Side Effects
Betahistine dihydrochloride	24 mg BID or 16 mg TID (2-3 months for episodic vertigo)	Improve the microcirculation in the labyrinth, thus reducing endolymphatic pressure. Treat symptoms of vertigo, tinnitus, loss of hearing and nausea.	Drowsiness, dry mouth and blurred vision
Prochlorperazine	5 mg orally every 8 hours	Vestibular suppressant	Use with caution in patients with decreased gastrointestinal motility, paralytic ileus, urinary retention, Parkinson's disease, hypothyroidism, cardiac failure, phaeochromocytoma, myasthenia gravis, prostate hyperthrophy, hypovolaemia, epilepsy or history risk of seizures.
Diazepam	2 to 10 mg orally or IV every 4 to 8 hours for severe cases (use only for 3 days)	Vestibular suppressant. It can reduce the subjective sensation of spinning but can also interfere with central compensation in peripheral vestibular conditions	Use with caution in patients with history of alcoholism and/or drug abuse, open-angle glaucoma, cardiorespiratory insufficiency, chronic respiratory insufficiency. Side effects includes impaired motor ability, tremor, headache
Dimenhydrinate	50 to 100 mg orally every 6 hours	vestibular suppressant with central anticholinergic activity	Use with caution in patients with history of asthma or lower respiratory tract symptoms, angle-closure glaucoma, prostatic hypertrophy. Side effects includes drowsiness dryness
Diphenhydramine	5 to 10 mg orally every 6 hours 5 to 10 mg by slow IV every 6 hours	suppressive effect on the central emetic center	Potential harm on cognitive functioning and gastrointestinal motility. May cause urinary retention, blurry vision, and dry mouth in the elderly
Meclizine	12.5 to 50 mg orally every 4 to 8 hours	suppressive effect on the central emetic center	May cause blurring of vision, dry mouth, constipation, dizziness, drowsiness, headache, vomiting, easy fatigability
Cinnarizine	150 mg orally for 12 weeks	Antihistamine, sedative, and Ca-channel blocking activity. Reduce motion sickness, nausea and vertigo.	Use with caution in Patients with hypotension (high dose), Parkinson's disease and porphyria. Children. Pregnancy and lactation.

Table 6. Pharmacologic prevention of vertigo among patients with vestibular migraine[30]

Drug	Dose	Expected Effect	Precaution and Side Effects
Triptans a.Sumatriptan b.Naratriptan c.Zolmitriptan	 25-50 mg 2.5 mg 2.5-5 mg	It relieves migraine by selectively acting at 5-HT_{1B} and 5-HT_{1D} receptors causing vasoconstriction and inhibition of neurogenic inflammation.	Use with caution in patient with CV risk factors, seizure disorder. May cause sensation of heaviness, pressure, pain and tightness in the chest, throat, jaw or neck.
Amitriptyline	10-25mg	Neuronal reuptake serotonin inhibitor. Relieves neuropathic pain and migraine.	Use with caution in patient with CV disease, head trauma, brain damage, alcoholism, history of seizures. May cause Serotonin syndrome, prolonged QT interval.
NSAID a.Naproxen b.Ibuprofen c.Aspirin d.Paracetamol	 500 mg 400 mg or 800 mg 500-1000 mg 1000 mg	Blocks cyclooxygenase, decrease the synthesis of prostaglandins, relieves migraine headaches.	Use with caution in patients with dyspepsia or lesion of the GI mucosa, asthma or allergic disorders, anemia, dehydration, menorrhagia, uncontrolled hypertension, G6PD deficiency, thyrotoxicosis. May cause tinnitus.
Anti-emetics a.Metoclopramide b.Domperidone	 10 mg orally or IV every 8 hours 10 mg every 8 hours	stimulates upper gastrointestinal motility dopamine blocker	Use with caution in patients with underlying neurological conditions, Parkinson' s disease, cardiac conduction disturbances or sick sinus syndrome, hypertension, uncorrected electrolyte imbalance, bradycardia, heart failure with coexisting renal impairment, risk factors of fluid overload. May cause dystonic reactions.
Triptans a.Sumatriptan b.Naratriptan c.Zolmitriptan	 25-50 mg 2.5 mg 2.5-5 mg	It relieves migraine by selectively acting at 5-HT_{1B} and 5-HT_{1D} receptors causing vasoconstriction and inhibition of neurogenic inflammation.	Use with caution in patient with CV risk factors, seizure disorder. May cause sensation of heaviness, pressure, pain and tightness in the chest, throat, jaw or neck.

intervention includes patient education, modalities for physical therapy, lifestyle modification and the use of alternative therapy. The intervention is usually with the patient reduce morbidity and offer the potential for sustained control when applied systematically.[33] As such, there should be open communication between the clinician and the patient and family to arrive at a consensus regarding the goals of treatment.

Summary of Evidence for Patient-centered Intervention: Health Education

Patient education should include causes and triggers of dizziness, lifestyle modification, recurrence and follow up. It is important to discuss the causes of dizziness. The triggers that may provoke recurrence of dizziness should also be probed. Questions regarding the timing (onset, duration, and evolution of dizziness) and triggers (actions, movements, or situations) that provoke dizziness can further assist to categorize the dizziness as peripheral or central in etiology.[3]

Proper patient education should provide re-assurance, explanation, and advice are essential, in combination with symptomatic treatment for the first few days.3 Patient education strategies should be provided verbally or using printed or visual materials that patient can easily understand. The goal of patient education is for the patient and family to understand the causes, triggers and prevention of recurrences or attacks of dizziness for better quality of life.

Other patient education strategies can be individualized based on the cause of dizziness. For instance, patients with Meniere's Disease may benefit with a booklet-based education. One RCT assessed the effectiveness of booklet-based education in patients with MD and included an arm using applied relaxation and controlled breathing, challenging negative beliefs, and lifestyle modification to reduce anxiety (cognitive-behavioral strategies) as compared with a waiting-list control group, with 120 subjects in each group. The self-help booklet group showed greater subjective improvement in health, confidence in understanding and coping with illness, and improved handicap (DHI). Also, those who reported adherence had better outcomes. Thus, the

Table 8. The peripheral and central causes of dizziness[20]

Peripheral Causes	Central Causes
Abnormalities in the peripheral vestibular system (Semicircular Canals, Saccule, Utricle, Vestibular Nerve) Benign paroxysmal positional vertigo Vestibular neuritis Meniere disease	Vestibular migraine Vertebrobasilar ischemia

authors concluded that self-management booklets offer an inexpensive and easily disseminated means of helping people with MD to cope with dizziness symptoms.[34]

Summary of Evidence for Patient-centered Intervention: Lifestyle and Diet Modification

Lifestyle and diet modification may also be dependent on the cause of dizziness. The evidence of benefit of dietary and lifestyle modifications is limited, individual patients may have identifiable triggers, the identification of which may improve symptom control. Clinicians should be knowledgeable on identification on lifestyle triggers to decrease attacks and symptoms of Meniere's Disease.[34] The treatment of Meniere's disease involves lifestyle changes, including limiting dietary salt intake to less than 2,000 mg per day, reducing caffeine intake, and limiting alcohol to one drink per day.[3] The table below are lifestyle triggers for Meniere's disease and interventions to prevent recurrence.

Summary of Evidence for Patient-centered Intervention: Physical Therapy

Recommendations on physical therapy for patients are also dependent as to the cause of dizziness. In a review study exercise-based vestibular rehabilitation (VR) shows benefits for adult patients with chronic dizziness with regard to symptom score, fall risk, balance and emotional status, improve balance and mobility and symptoms.[35] Vestibular rehabilitation was most effective if started within the first month after vestibular neuritis while there was a high efficacy of complex rehabilitation, including vestibular exercises and trainings on stabilographic platform with biofeedback, in patients with Meniere's disease.[37]

The different physical therapy interventions such as vestibular rehabilitation (VR) in combination with canal repositioning maneuver (CRM) and manual therapy (MT) showed beneficial effects but quality of evidence is low. A meta-analysis of randomized controlled trials of the Epley maneuver versus placebo included eight trials with low risk of bias. Complete resolution of vertigo occurred significantly more often in the Epley treatment group when compared to a sham maneuver or control (odds ratio (OR) 4.42, 95% confidence interval (CI) 2.62 to 7.44). There was no difference when comparing the Epley with other physical therapy exercises like the Semont manoeuvre but Epley was found to be than Brandt-Daroff exercises (OR 12.38, 95% CI 4.32 to 35.47; 81 participants). Adverse effects Adverse effects were infrequently reported.[37] Repositioning maneuvers maybe dependent on the cause, for instance Epley maneuver or Brandt-Daroff exercises works for BPPV (Bhattacharyya, et al. 2017). VR training in addition to CRM in older adults provides benefit to improve balance but with moderate quality of evidence.

There are also moderate to strong evidence that VR is a safe, effective management for unilateral peripheral vestibular dysfunction, based on a number of high quality randomized controlled trials as well as moderate evidence that VR provides a resolution of symptoms and improvement in functioning in the medium term. However, there is evidence that for the specific diagnostic group of BPPV, physical (repositioning) maneuvers are more effective in the short term than exercise-based vestibular rehabilitation.[38]

A web-based approach vestibular rehabilitation has been promoted for patients with chronic dizziness. This web application for chronic dizziness appears to be feasible and may reduce symptoms in patients who have struggled with serious and long-lasting dizziness. The Web-based vestibular rehabilitation in persistent postural-perceptual dizziness consists of six weekly online sessions, with written information and video presentations. It is self-instructive and freely available on NHI.[35]

Table 9. Frequently asked questions of patients with dizziness[34]

Questions	Answers
What is vertigo? Tinnitus? Meniere's Disease	Vertigo: feeling of spinning when you are still Tinnitus: ringing, buzzing or other noises in your ear when there nothing causing the noise Meniere's Disease: inner ear disorder associated with episodes of vertigo
What tests can be ordered?	Audiogram MRI of the Brain
What treatments can be provided?	Medications to reduce symptoms Noninvasive therapies
What to do to decrease symptoms?	Identify triggers to decrease symptoms

Table 10. Frequently asked questions on Meniere's disease (MD)

Questions on MD	
What are triggers	Advise patient to keep a diary of possible triggers, diet and activities
What special diet	Ideally limit 1500-2300 mg of salt as recommended by American Heart Association (Increased sodium consumption can increase fluid in the inner ear)
What lifestyle changes to do to prevent symptoms	Get adequate sleep, exercise, stress management, join support groups, low salt diet, avoid excessive caffeine, drink lots of water and avoid sugary beverages

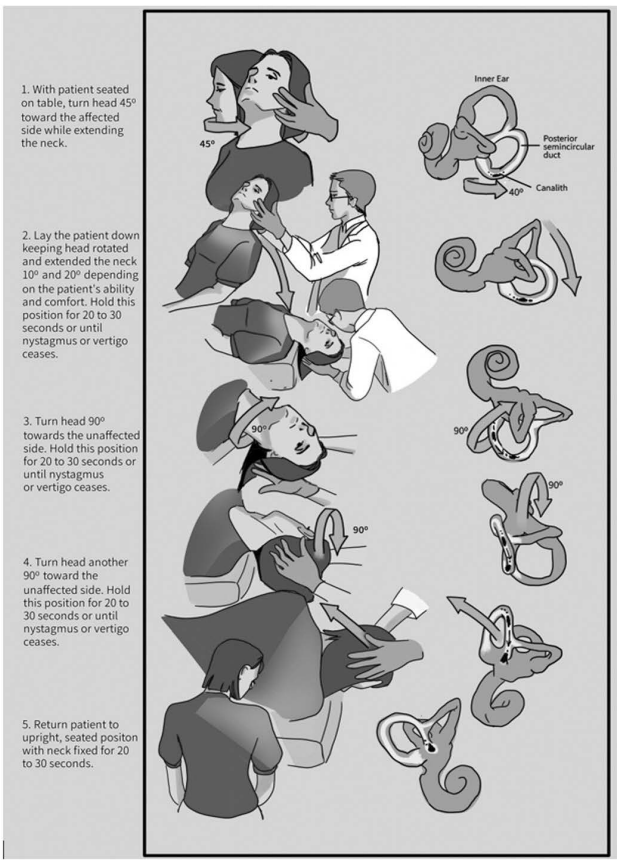


Figure 3. Epley maneuver.

Summary of Evidence for Patient-centered Intervention: Alternative or Complimentary Therapy

Multimodal approach using manual therapy in combination with acupuncture and vestibular rehabilitation showed the maximum therapeutic effect on elimination of musculo-tonic disorders, reduction of a pain syndrome with a complete regression of vertigo and postural instability.[39] Acupuncture demonstrates a significant immediate effect in reducing discomforts and VAS of both dizziness and vertigo.[40] As for the use of acupuncture in Meniere's Disease, two systematic reviews reported promising therapeutic approach for Meniere's Disease. There are some positive findings in vertigo control but currently available evidence is insufficient to make a definitive conclusion, with studies of poor quality.[36]

Summary of Evidence for Family-focused Interventions

Family directed education is important in any disease management. The clinician should be able to provide appropriate information on the causes and types, triggers and non-pharmacologic interventions to address dizziness. There are few studies that focused on family interventions on dizziness available. However, the different patient centered interventions should involve a family member as an ally to care of a patient presenting with dizziness. The role of the family as allies in the care of chronically ill patients have been supported by evidence in the last decade has seen a rapid growth of self-management programs that include family members. They are well suited to provide sustained and effective self-management support, often strongly influence on the lifestyle as such the foods brought into the patient's household and prepared for meals, whether patients have time for physical activity among other competing time demands, and influence where health fits in the hierarchy of family priorities. More so, family members often provide important emotional support to patients facing the stresses of caring for their illness.[41] The family has a role in the avoidance of triggers, adherence to lifestyle modifications and performance of some vestibular maneuvers and compliance with regular follow up. The family often create the practical, social, and emotional context for self-care, making it easier or harder for patients to achieve their health and behavior goals thus achieving patient success in the treatment outcomes.[41]

Family members have established relationships with health care providers since they accompany patients to clinic visits or can be in constant communication in matters pertaining to patient care. A family member assigned as family caregiver usually frequents the clinic with the patient. Thus, the family members frequently play an active role in managing the patient's chronic illness. There are observational studies suggest that patients have better disease management and outcomes when they have increased support from family. For example, social support is associated with better glycemic control for people with diabetes, better blood pressure control for people with hypertension, fewer cardiac events for people with heart disease, and better joint function and less inflammation for people with arthritis.[42]

Summary of Evidence for Community-oriented Interventions

Community oriented interventions for dizziness are focused on physical therapy such as vestibular rehabilitation. A RCT on internet based vestibular rehabilitation reported a reduction on dizziness and dizziness related disability in older patients. Tai chi as vestibular rehabilitation has very low quality of evidence to improve postural control and mobility. It may seem to be effective for vertigo, dizziness, balance disorder (VDB) but not VDB post stroke. Most of the researche on canal repositioning maneuvers in this review included older adults for the treatment of vertigo but high quality of evidence is few.[36] This training can also be done by the community by following an internet based vestibular rehabilitation intervention. The vestibular rehabilitation includes specific exercises such as nodding and shaking head, repeated practice of these movements promotes adaptation and gradual reduction of movement provoked dizziness. Also, it promotes psychological habituation to the symptoms and reductions in avoidance behaviors over a period of 6 weeks. This intervention supports the evidence based self-management strategies for older adults in primary care.[43]

Expected Patient Outcome

Recommendation 20. The patient should know the nature of dizziness, causes and potential complications and develop skills in postural exercises. (Strong Recommendation, Moderate Quality Evidence)

Recommendation 21. Decrease in frequency and severity should expected within 48 hours and resolution is expected within a month. (Strong Recommendation, Moderate Quality Evidence)

Recommendation 22. Improved quality of life should also be elicited. (Strong Recommendation, Moderate Quality Evidence)

Recommendation 23. Referral to appropriate specialty should be done if no resolution or progression of symptoms or impaired quality of life for more than a month. (Strong Recommendation, Expert Opinion)

Summary of Evidence

Knowledge of the expected patient outcomes is essential to determine the effectiveness of management in family and community practice. Measuring patient outcomes while undergoing management provides an opportunity for modification of management to achieve the intended final outcome. This will also ensure that the follow-up of patient is continuous until symptoms are under adequate control.

We search PubMed using the terms "dizziness", "vertigo" and "practice guideline" to search for relevant guidelines on the topic. We were able to retrieve 7 practice guidelines from this. We also searched for local guidelines with assistance from a university library service and pharmaceutical partner. We were able to obtain 3 more guidelines after this search. One local guideline was published way back in 2011 and was excluded from our review. The guidelines recommended options for clinical assessment, some options for laboratory testing, pharmacologic and non-pharmacologic intervention. Only two guidelines reviewed contained recommendation on patient outcomes that should be monitored.[4]

Basura, et al., recommended to measure the following while undergoing treatment i.e., complete resolution, improvement or decrease severity, or worsening of symptoms. These recommendations were based on the outcomes measured in the RCTs cohort studies, and observational studies that were used in the recommendations for management.[34] Clinical trials on dizziness report follow-up assessments for treatment outcomes at 40 hours, 1-2 weeks, 1 month, and up to 6 months. In clinical trials, successful treatment outcomes are traditionally defined as subjective symptom resolution and/or conversion to a negative Dix-Hallpike test. Bhattacharyya, et al., also emphasized that those who have vestibular symptoms remain at risk for falls, have decreased quality of life, and other consequences of unresolved dizziness.[4] Systematic review and meta-analysis on quality of life as an outcome in clinical trials of vertigo have been done. Eleven studies were included, and the most commonly used measurement was the Ménière's Disease Outcome Questionnaire (MDOQ). The review showed significant improvements in QOL scores for treatment interventions.[44]

However, response to treatment among patients with dizziness is variable. It will depend on several factors like accuracy of diagnosis, the duration and severity of symptoms prior to the diagnosis, and patient compliance with treatment, both pharmacologic and non-pharmacologic. Because of these, guidelines also recommend educating the patient on BPPV. One of the most important goals of education is an understanding of what dizziness and vertigo is. There is risk of recurrence and patients should be also counselled accordingly. Counseling will likely have several benefits. These include earlier recognition by patients, address the potential anxiety and adjust their daily routine to minimize the impact of symptoms. symptomatology. It is therefore important that effective health education must be given to patients and their family. Effectiveness of treatment can also be demonstrated by a quick check on the patient understanding and demonstration postural skills to control the symptoms.[4]

In summary, studies reviewed by three guidelines suggest that the outcomes of treatment to be expected and monitored should be 1) resolution of dizziness, 2) decrease severity of dizziness, and 3) improved quality of life. Not achieving this within 6 months constitute treatment failure. In addition, the guidelines reviewed moderate quality studies to suggest that patient knowledge and understanding and demonstration of skills to postural exercises can contribute to the control of symptoms.

Discussion

Summary and Clinical Implication

Clinical guidelines are created in order to develop recommendations that are intended to optimize patient care and outcomes. The recommendations are evidence-based and with consideration of the consensus of a panel of experts dealing with dizziness in their clinics. According to Woolf, et al. benefits of clinical guidelines can be to patients, health care professionals and the health care system.[45] For patients, benefits are to improve health outcomes, reduced morbidity and mortality, improved quality of life, and improve consistency of care. For healthcare professionals, guidelines can improve quality of clinical decisions and support quality improvement activities. For healthcare systems, clinical guidelines may be effective in improving efficiency and optimizing value for money. Implementation reduces outlays for hospitalization, prescription drugs, surgery and other procedures.

Recommendations for Dissemination and Implementation

The pathway and guideline will be disseminated to selected PAFP chapters and members and other stakeholders for consensus development. Dissemination will be posting in the PAFP website, publication in the Filipino Family Physician Journal, conference presentations (PAFP Annual Convention), and focused group discussions. The implementation of clinical pathways at the clinic level may be through quality improvement activities in the form of patient record reviews, chart audits and feedback. Audit standards may be the assessment and intervention recommendations in the clinical pathways. At the organizational level the PAFP should establish a new model of quality improvement initiative where self-practice reviews are included as part of the program. Within PAFP chapters, peer group discussions, individual feedback and quality improvement reports are the main components.

Monitoring and Audit Criteria

Family physicians may use the clinical pathway in order to monitor and check if the care given is consistent with the guideline

Clinical Pathway

Visit	Pathway Tasks				Patient Outcomes
	History and Physical Examination	Laboratory	Pharmacologic Intervention	Non-pharmacologic Interventions	
First Visit	__Ask for the patient's description and classify into one of the four types: vertigo, presyncope, disequilibrium, and lightheadedness and classify as acute/episodic or chronic/sustained. __Obtain a medical history focusing on the timing, triggers, associated symptoms, risk factors for atherosclerotic vascular disease, and functional status or quality of life. __Perform a physical examination focusing on vital signs, HEENT (including otoscopy), cardiovascular and neurologic examination. __Perform special physical examinations like Dix-Hallpike maneuver, HINTS plus test for spontaneous episodic vertigo to check for stroke and hyperventilation provocation test for patients suspected of anxiety __Elicit red flags that should warrant referral for evaluation and management.	__Laboratory testing is not routinely recommended however, testing may be requested if there is a need to identify a definite etiology to guide treatment. __For patients with vertigo and with auditory symptoms (i.e., hearing loss, tinnitus and aural fullness, etc.), pure tone audiometry speech test may be requested if available. __For patients with presyncope/syncope and a chronic medical condition is being considered, complete blood count may be requested for those with probable blood dyscrasia, serum blood glucose may be requested for those with diabetes, electrocardiogram and lipid profile may be requested for those with cardiovascular disease. __For patients with disequilibrium and with an abnormal neurologic physical examination finding, CT scan may be requested.	__Empiric trial of short course (7 days) pharmacologic treatment for symptom relief should be offered. __For patients with mild to moderate vertigo, offer histamine analogue (betahistine) or antihistamine (meclizine, diphenhydramine, dimenhydrinate or cinnarizine) for symptom relief. __For patients with mild to moderate vertigo associated with migraine (vestibular migraine), aside from symptom relief, offer any of the triptans as preventive medication. __For patients whose dizziness is described as disequilibrium (gait imbalance) or presyncope (near faintness) or dizziness with anxiety attack, offer symptomatic treatment and intervention based on the underlying cause or consider referral to appropriate specialist.	__All patients should be provided with health education on causes, triggers and follow up. __All patients should be advised on appropriate diet and lifestyle modification. __Depending on the nature of vertigo, educate and train the patient on canal repositioning maneuver and vestibular rehabilitation. Referral to rehabilitation medicine may be considered.	__The patient should know the nature of dizziness, causes and potential complications and develop skills in postural exercises. **Follow-up Visit** _ Follow after 1 week
Variations	__For patients consulting via telemedicine, obtain a medical history focusing on the timing, triggers, associated symptoms, risk factors and observe and conduct self-physical examination (vital signs, mental status, ocular and facial nerve)				

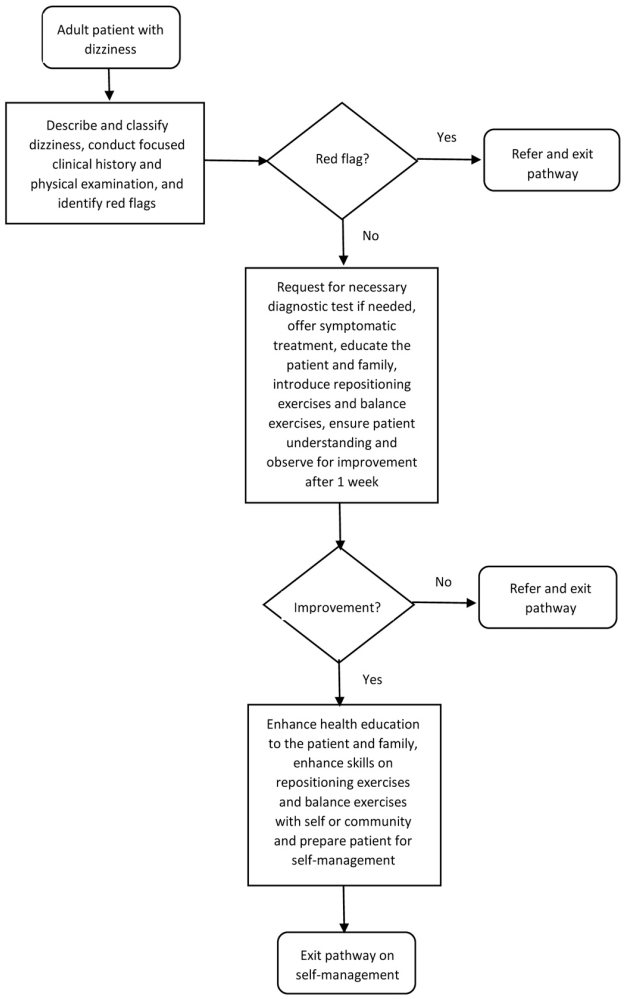
Visit	Pathway Tasks				Patient Outcomes
	History and Physical Examination	Laboratory	Pharmacologic Intervention	Non-pharmacologic Interventions	
Second Visit	__Re-assess symptoms improvement and quality of life __Re-assess for red flags __Perform a physical examination focusing on vital signs, HEENT (including otoscopy), cardiovascular and neurologic examination, and special maneuvers if indicated __Assess quality of life and functional status __Assess adherence to medication	__Follow-up diagnostics if requested and interpret laboratories. Facilitate if not yet done	__Adjust dose of medication and ensure adherence __Prescribe other medications according to underlying cause of dizziness	__Enhance health education on causes, triggers, appropriate diet and lifestyle modification to both patient and family. __Developed skills on canal repositioning maneuver and vestibular rehabilitation. Referral to rehabilitation medicine may be considered. __Participation in community-based group balance training exercise.	__The patient fully understands the nature of dizziness, causes and potential complications and develop skills in postural exercises. __Decrease in frequency and severity should be expected __Improved quality of life should also be expected __Referral to appropriate specialty should be done if no resolution or progression of symptoms or impaired quality of life for more than a month
Variations	__If red flags identified or without improvement of symptoms, refer to specialist	__If with cranial CT scan abnormalities, refer to specialist			
Continuing Visit	__Re-assess symptoms improvement and quality of life __Re-assess for red flags __Perform a physical examination focusing on vital signs, HEENT (including otoscopy), cardiovascular and neurologic examination, and special maneuvers if indicated __Re-assess adherence with medication and vestibular exercises	__Monitoring of laboratories according to underlying comorbidities	__Prescribe symptomatic treatment for self-management __Prescribe other medications according to underlying cause of dizziness	__Enhance health education on causes, triggers, appropriate diet and lifestyle modification to both patient and family. __Enhance skills on canal repositioning maneuver and vestibular rehabilitation. Referral to rehabilitation medicine may be considered. __Sustained participation in community-based group balance training exercise.	__The patient fully understands the nature of dizziness, causes and potential complications and develop skills in postural exercises for self-management __Decrease in frequency and severity should be expected __Improved quality of life should also be expected
Variations	__If red flags identified or without improvement of symptoms, refer to specialist				

recommendations. The clinical pathway recommendations are based on the guideline recommendations which may serve as a checklist or audit criteria. They are time bound (first, second and continuing visits), and arranged according to history, physical examination, diagnostics, pharmacologic, non-pharmacologic and patient outcomes.

Algorithm

An algorithm may be used as tool to communicate the approach to the diagnosis and management of dizziness. The family physician may describe the manner of evaluation and management that the patient may undergo. The algorithm provides an overview of the guideline recommendations and a visualization of the possible diagnostics or treatment that patient will get.

Algorithm



Facilitators and Barriers

Clinical guidelines and pathways are developed in order to improve quality of care and reduce health care costs based on the latest evidence. However, studies have shown that at least 30-40% of patients do not receive care according to current scientific evidence, and 20% or more of the care provided is not needed or is potentially harmful to the patients, in countries like the US and Netherlands.[46] There are multiple barriers and facilitators to guideline dissemination and implementation. There is consistent evidence showing that the following are the most frequent barriers: absence of a leader or champion of the implementation process within organizations, lack of time of health professionals, lack of clarity and a lack of credibility in the evidence of the CPG, and the lack of knowledge of the CPG. Facilitators for implementation most frequently identified were consistent leadership, commitment of the members of the team, administrative support of the institution, existence of multidisciplinary teams, applications of technology to improve the practice and education regarding the guidelines.[47]

Another main challenge in the management of vertigo and dizziness was to establish definite diagnosis where the main reasons identified were lack of opportunities for exchange and cooperation with colleagues, times and financial pressure, and lack of equipment.[48] It was suggested that to resolve this issue, educational meetings and interventions targeting management have been reported to achieve the highest effect on guideline adherence in primary care. Policies and strategies therefore should be based on the knowledge of the barriers and facilitators to implementation of clinical guidelines. A leader should be in place at either the organizational, chapter or department level to help with the implementation process. Several discussions should be done with the members in order to encourage and gain their commitment.

Resource Implications

All the recommendations are formulated based on the available evidence and based on the available resources. Most of the diagnostic tests are available in urban practice, but some recommended imaging test may not be available. The pharmacologic interventions are readily available in community drugstores. The expertise for implementing some non-pharmacologic interventions may not be available in some settings. Family physicians are recommended to improvise in those settings.

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