Approach to the patient with dizziness

AUTHOR: Jason JS Barton, MD, PhD, FRCPC
SECTION EDITORS: Michael J Aminoff, MD, DSc, Daniel G Deschler, MD, FACS
DEPUTY EDITOR: Janet L Wilterdink, MD

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INTRODUCTION

"Dizziness" is a nonspecific term often used by patients to describe symptoms. The most common disorders lumped under this term include vertigo, nonspecific "dizziness," disequilibrium, and presyncope. The first step in the evaluation is to fit the patient with typical symptoms into one of these categories.

The general approach to dizziness is reviewed here. The evaluation of vertigo and presyncope (the evaluation of which is the same as the syncope evaluation) are discussed in detail separately. (See "Evaluation of the patient with vertigo" and "Syncope in adults: Clinical manifestations and initial diagnostic evaluation".)

GENERAL APPROACH

The reported proportion of patients with various etiologies of dizziness in community surveys [1], primary care settings [2,3], the emergency department [4-9], and the specialized dizzy clinic [10-14] are similar: Approximately 40 percent of dizzy patients have peripheral vestibular dysfunction; 10 percent have a central brainstem vestibular lesion; 15 percent have a psychiatric disorder; and 25 percent have other problems, such as presyncope and disequilibrium (table 1). The diagnosis remains uncertain in approximately 10 percent. The distribution of

causes varies with age. Older adults have a higher incidence of central causes of vertigo (approaching 20 percent), most often due to stroke.

The patient's description is critical for classifying the etiology of dizziness. In one series, the history was most sensitive for identifying vertigo (87 percent), presyncope (74 percent), psychiatric disorders (55 percent), and disequilibrium (33 percent) [2]. The physical examination generally confirmed but did not make the diagnosis. Positional changes in symptoms, orthostatic blood pressure and pulse changes, observation of gait, and detection of nystagmus were most helpful on physical examination [2]. Most psychiatric disorders were not detected prior to standardized psychological testing using the diagnostic interview schedule (DIS). Not surprisingly, no patients volunteered the likelihood of a psychiatric cause of dizziness.

Asking open-ended questions, listening to the patient's description of his or her symptoms, and checking and gathering additional information from specific questions should allow the clinician to form a hypothesis regarding the type of dizziness. As an example, a patient who says "I nearly blacked out" might be asked "Do you mean you nearly fainted?" An affirmative reply elicits another checking question, "So you felt you were passing out?" The clinician should also establish the time course, provoking and aggravating factors, concurrent symptoms, age, preexisting conditions, and the findings on physical examination. These factors are especially useful to narrow the differential diagnosis when the patient's subjective description is difficult to interpret, such as symptoms characterized as "wooziness," brief sense of motion, or imbalance. The clinician can then decide on the need and extent of further testing and/or evaluation.

VERTIGO

Vertigo is the predominant symptom that arises from an acute asymmetry of the vestibular system. The vestibular system includes the vestibular apparatus in the inner ear, the vestibular nerve and nucleus within the medulla, as well as connections to and from the vestibular portions of the cerebellum. Vertigo is discussed in more detail separately. (See "Evaluation of the patient with vertigo".)

Patients often experience vertigo as an illusion of motion; some interpret this as self-motion, others as motion of the environment. The most common perception is a spinning sensation; patients may also use terms such as "whirling," "tilting," or "moving." However, not all patients describe their vertigo in such vivid terms. Vague dizziness, imbalance, or disorientation may eventually prove to be due to a vestibular problem.

Distinguishing vertigo from other types of dizziness — The spinning quality of vertiginous sensations is notoriously unreliable [15]. Lack of spinning cannot be used to exclude vestibular disease, given the difficulty many patients have in putting their dizzy experience into words. On the other hand, some patients with presyncope from vasovagal or cardiac disease can interpret their sensation of dizziness as a spinning sensation [16].

The time course, provoking factors, and aggravating factors of dizziness are more useful features in establishing the cause of dizziness. One study found that many physicians that evaluate patients with dizziness may rely too heavily on symptom quality for diagnosis and do not appreciate the clinical significance of these other features [17].

Time course — Vertigo is never continuous for more than a few weeks. Even when the vestibular lesion is permanent, the central nervous system adapts to the defect so that vertigo subsides over several weeks. Constant dizziness lasting months is usually psychogenic, not vestibular. However, the physician must be clear on what a patient means by "constant." Some patients who say they have constant dizziness for months actually mean that they have a constant susceptibility to frequent episodic dizziness; this can be a vestibular problem.

A useful categorization divides patients with vertigo into those with acute prolonged severe vertigo (eg, vestibular neuronitis, stroke), recurrent spontaneous attacks (eg, Meniere disease, vestibular migraine), recurrent positionally triggered attacks (benign paroxysmal positional vertigo), and chronic persistent dizziness (eg, psychogenic, cerebellar ataxia) [18].

Provoking factors — Certain types of vertigo occur spontaneously, while others are precipitated by maneuvers that change head position or middle ear pressure (eg, coughing, sneezing, or Valsalva maneuvers). Positional vertigo and postural presyncope are two common conditions that are frequently confused. Both are associated with dizziness upon standing, as when arising from bed. The key to the diagnosis is to determine whether dizziness can be provoked by maneuvers that change head position without lowering blood pressure or decreasing cerebral blood flow. Such maneuvers include lying down, rolling over in bed, and bending the neck back to look up. Dizziness in these settings suggests positional vertigo, not postural presyncope.

Aggravating factors — All vertigo is made worse by moving the head. This is a useful feature for distinguishing vertigo from other forms of dizziness. Many patients in the midst of a vertiginous attack are petrified to move. If head motion does not worsen the feeling, it is probably another type of dizziness.

Associated signs and symptoms — Vertigo, whether of central or peripheral origin, is generally accompanied by nystagmus and postural instability. Other signs and symptoms may

be useful in distinguishing between central and peripheral causes of vertigo.

Nystagmus — The presence of nystagmus suggests that dizziness is vertigo. Nystagmus is not always readily visible, although more subtle forms can be seen during funduscopy or on electronystagmography. Some types of nystagmus are only seen after a provocative maneuver (eg, Dix-Hallpike maneuver). The bilaterally symmetric appearance of a few beats of horizontal nystagmus on lateral gaze is normal (physiologic "endpoint" nystagmus). Pathologic nystagmus is asymmetric or more pronounced or prolonged.

Certain features of nystagmus may suggest a central versus a peripheral cause of vertigo (table 2).

Positional changes such as flexing, extending, rotating, or laterally bending the cervical spine may elicit vertigo and nystagmus in susceptible patients:

- The Barany or Dix-Hallpike maneuver involves moving the patient rapidly from the sitting to the lying position with the head tilted downward off the table at 45 degrees and rotated 45 degrees to one side. This is a key diagnostic test for benign paroxysmal positional vertigo and has an 80 percent sensitivity for this specific condition. It should be stressed that the maneuver is **not** useful in diagnosing other vestibulopathies.

- The supine roll test for lateral semicircular canal-related vertigo may be performed in patients with a compatible history but a negative Dix-Hallpike maneuver [19].

The onset of vertigo and nystagmus with these maneuvers establishes vertigo as the patient's symptom, if the vertiginous sensation is the same as the patient previously experienced. The examiner notes features of the symptoms and signs to aid in the distinction between central and peripheral causes of vertigo (table 3) [20].

Other bedside tests of vestibuloocular function are discussed separately. (See "Evaluation of the patient with vertigo", section on 'Other vestibular signs'.)

Postural instability — The effects of lesions of the vestibular system upon postural stability are variable, but it is common for patients with vertigo to have difficulty maintaining steady upright posture when walking, standing, and even sitting unsupported, particularly when the symptoms are acute.

Hearing loss — Symptoms of ear involvement are very suggestive of a peripheral cause of vertigo, although their absence does not exclude the diagnosis. The physician should ask if there has been any hearing loss, about its duration and progression, whether unilateral or

bilateral, and about accompanying symptoms such as discharge or drainage from the ear, tinnitus, or a history of otitis.

Subclinical hearing loss can be detected with reasonable sensitivity in the office by holding your fingers a few inches away from the patient's ear and rubbing them together softly or asking the patient to repeat a few numbers or words whispered into his or her ear. A 512 Hz tuning fork is also useful. Audiometry is more sensitive. (See "Evaluation of the patient with vertigo" and "Evaluation of hearing loss in adults".)

Brainstem signs — The presence of additional neurologic signs strongly suggests the presence of a central vestibular lesion. Symptoms such as staggering or ataxic gait, vomiting, headache, double vision, visual loss, slurred speech, numbness of the face or body, weakness, clumsiness, or incoordination should be reviewed with the patient.

A careful neurologic examination should be performed for cranial nerve abnormalities, Horner syndrome, motor or sensory changes, dysmetria, or abnormal reflexes (see "The detailed neurologic examination in adults"). However, the absence of other neurologic findings does not entirely exclude a central process. (See "Evaluation of the patient with vertigo".)

PRESYNCOPE

Presyncope is the prodromal symptom of fainting or a near faint. Presyncope occurs more commonly than syncope. It usually lasts for seconds to minutes and is often recognized by the patient as "nearly blacking out" or "nearly fainting." When the symptoms are less intense, their description may be less clear. Patients may also report lightheadedness, a feeling of warmth, diaphoresis, nausea, and visual blurring occasionally proceeding to blindness. An observation of pallor by onlookers usually indicates presyncope. Presyncope usually occurs when the patient is standing or seated upright and not when supine (if the latter, one should suspect a cardiac arrhythmia rather than hypotension).

A history of cardiac disease, including cardiac dysrhythmias (tachycardias or bradyarrhythmias), coronary heart disease, and congestive heart failure, is relevant [21]. The patient should be asked specifically about palpitations, chest discomfort, or dyspnea (although this may suggest anxiety as an alternative cause as well).

The etiology and evaluation of presyncope are the same as for syncope. Orthostatic hypotension, cardiac arrhythmias, and vasovagal attacks are some of the more common causes (table 4 and table 5). (See "Syncope in adults: Clinical manifestations and initial diagnostic evaluation".)

DISEQUILIBRIUM

Disequilibrium is a sense of imbalance that occurs primarily when walking. Chronic dizziness or disequilibrium can cause significant impairment of physical and social functioning, particularly in older adults [22,23].

Disequilibrium may result from peripheral neuropathy, a musculoskeletal disorder interfering with gait, a vestibular disorder, a cerebellar disorder, and/or cervical spondylosis [10,11]. Patients with Parkinson disease frequently suffer from disequilibrium and are subject to postural hypotension as well as imbalance [24]. Cervical spondylosis may be associated with dizziness that is apparently related to a disturbance in postural control [25], although this is not a universally accepted cause of dizziness [2]. Visual impairment, whether from underlying eye disease or poor lighting, typically exacerbates the sense of imbalance. This is also true of cerebellar disorders. Cerebellar disorders can affect mainly gait, but often have associated dysarthria and eye signs, such as gaze-evoked nystagmus, poor smooth pursuit, and downbeat nystagmus. If the cerebellar hemisphere is also involved, there will be incoordination of limbs.

The physician should inquire about symptoms of neurologic and gait disorders, especially those suggestive of parkinsonism, cerebellar incoordination, or peripheral neuropathy. In the series cited above, few patients volunteered that their dizziness was associated with walking, standing, turning, or falling; most with disequilibrium required observation of gait and a neurologic examination to identify the diagnosis [2]. (See "The detailed neurologic examination in adults".)

NONSPECIFIC DIZZINESS

Nonspecific dizziness is often difficult for the patient to describe. They may simply insist, "I am dizzy." Patients may choose from suggested descriptions to say they are "giddy" or "lightheaded"; however, they may also endorse a fainting or spinning sensation.

Psychiatric disorders may be the primary cause of nonspecific dizziness in some cases [26]. One-quarter of such individuals had major depression, one-quarter had generalized anxiety or panic disorder, and the remainder had somatization disorder, alcohol dependence, and/or personality disorder in one series [2]. Other series report higher rates of panic disorder [27]. (See appropriate topic reviews for diagnostic discussions of these illnesses.) Ill-defined disorders such as fibromyalgia have also been associated with dizziness and vertigo [28] (see "Clinical manifestations and diagnosis of fibromyalgia in adults"). Patients who have a chief cause of dizziness that is not psychiatric may also have a psychiatric disorder as a contributing factor.

Psychotherapy may help manage this type of dizziness. A meta-analysis of three randomized trials that used cognitive behavioral therapy in combination with relaxation techniques or vestibular rehabilitation found that therapy was helpful in managing dizziness in the short term, although not associated anxiety and depression [29].

Nonspecific dizziness is sometimes related to hyperventilation. This usually occurs in settings that are at least mildly stressful. Dizziness that accompanies hyperventilation, anxiety, or depression often builds up gradually, waxes and wanes over a period of 20 minutes or longer, and gradually resolves. There may be no sensation of "air hunger" since these patients are hyperventilating only to a slight degree.

Less intense versions of presyncope or vertigo may be experienced by the patient as nonspecific dizziness (see 'Vertigo' above and 'Presyncope' above). Nonspecific dizziness (as well as vertigo) may follow head trauma or whiplash injuries [30]. Hypoglycemic episodes may also produce a nonspecific sensation of dizziness as the chief symptom [31]. In addition, patients should be asked about medications, especially antidepressants and anticholinergics; a variety of medications produce dizziness as a side effect or as a symptom of abrupt drug withdrawal [32,33].

There are no physical signs that are diagnostic of nonspecific dizziness. Most patients are healthy, young individuals without detectable disease involving the neurologic, cardiovascular, or otolaryngologic systems. Purposeful hyperventilation is one means to confirm that diagnosis. The patient is coached to hyperventilate until they become dizzy, then to identify whether or not the dizziness mimics spontaneously occurring symptoms. If so, the patient will be convinced, as well as the physician, that hyperventilation is the etiology. However, the examiner must observe the eyes of the patient to see if there is nystagmus; some pathologic vestibular lesions are exacerbated or unmasked by hyperventilation. If nystagmus is seen, the diagnosis is a vestibular lesion, not hyperventilation.

Reproducing symptoms by hyperventilation is often reassuring to the patient and in itself therapeutic. It is possible for individuals to learn to breathe less deeply and through the nose, thereby limiting hyperventilation. If patients understand that a number of minutes must elapse before the symptoms resolve, they can spontaneously abort their own attacks. Treatment of anxiety or depression with pharmacotherapy should be based upon the symptoms of these disorders, not necessarily upon the presence of nonspecific dizziness.

DIZZINESS IN OLDER PATIENTS

Dizziness in the older adult deserves specific mention because of its high prevalence, up to 38 percent in some series, and its attendant risk of falls, functional disability, institutionalization, and even death [34,35]. Assessment of dizziness in older patients is challenging because it is frequently attributable to multiple problems, including vertigo, cerebrovascular disease, neck disorders, physical deconditioning, and medications [36]. Visual impairment from cataracts and other conditions is common in older adults and likely exacerbates the disability that is associated with dizziness [11]. One study found that 44 percent of patients aged 65 to 95 years had more than one condition causing dizziness [37]. Some call this entity multiple-sensory defect dizziness.

In a population-based study of 1087 community-living individuals 72 years of age or older, 261 (24 percent) reported having an episode of dizziness during the two months prior to study onset and that the dizziness (whether persistent or intermittent) had been present for at least one month [34]. The investigators found seven characteristics that were independently associated with dizziness on multivariate analysis:

- Anxiety trait
- Depressive symptoms
- Impaired balance (path deviation and time to turn circle greater than four seconds)
- Past myocardial infarction
- Postural hypotension (mean decrease in blood pressure ≥20 percent)
- Five or more medications
- Impaired hearing

Only 10 percent of study participants with none of these seven characteristics reported dizziness. The prevalence of dizziness in those who had one, two, three, four, and five or more of these characteristics was 18, 27, 33, 50, and 68 percent, respectively. The authors concluded that while dizziness in some older individuals may primarily be due to one problem, a number of older patients likely have a multifactorial etiology.

One study of 417 patients aged 65 to 95 years found that most, 69 percent, of patients had presyncope-type dizziness [37]. Underlying cardiovascular disease was the most common contributing factor in 57 percent, followed by peripheral vestibulopathy (14 percent) and psychiatric conditions (10 percent).

Drug side effects are a contributor to dizziness in 20 to 25 percent of older patients [35,37].

Treatment in these individuals should be directed at the most remediable problems [36]. Physicians should also ask about falling or dizziness while driving, which would require intervention to prevent injury. (See "Falls in older persons: Risk factors and patient evaluation".)

INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topics (see "Patient education: Vertigo (a type of dizziness) (The Basics)")
- Beyond the Basics topics (see "Patient education: Vertigo (Beyond the Basics)")

SUMMARY

- **Initial approach** – A complaint of dizziness is nonspecific and requires further clarification.

  The cause of dizziness (vertigo, presyncope, disequilibrium, or nonspecific dizziness) is best elucidated by the history and confirmed by physical examination. (See 'General approach' above.)

- **Clinical features suggesting vertigo** – Most patients with dizziness have vertigo. Most patients experience vertigo as an illusion of movement, not necessarily spinning, of themselves or the environment.

  A key historical aspect of vertigo is exacerbation by head movement.

  The presence of nystagmus suggests that the dizziness is vertigo.

  Associated hearing loss or tinnitus suggests peripheral vertigo; associated brainstem signs suggest central vertigo. (See 'Vertigo' above.)

- **Clinical features suggesting presyncope** – Presyncope is usually experienced as a sensation of impending faint.

  This diagnosis is further suggested by the occurrence of dizziness only in the upright posture, in patients with cardiac disease, and/or when associated pallor is described by onlookers. (See 'Presyncope' above.)

- **Disequilibrium** – Dizziness that represents disequilibrium or a sense of imbalance may be the presenting symptom of a peripheral neuropathy, parkinsonism, cerebellar disease, and/or cervical myelopathy. (See 'Disequilibrium' above.)

- **Nonspecific dizziness** – Nonspecific dizziness may have some clinical features of the other syndromes and has a wide differential diagnosis that may include milder forms of vertigo, presyncope, and disequilibrium, as well as medication side effects, psychiatric disease, and metabolic derangements. (See 'Nonspecific dizziness' above.)

  Multifactorial dizziness may also be difficult to categorize. Older patients in particular often have multiple etiologic contributors to their dizziness. (See 'Dizziness in older patients' above.)

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GRAPHICS

Causes of dizziness in different clinical settings

Variable	Kroenke, et al 1992	Drachman and Hart 1972	Nedzelski, et al 1986	Herr, et al 1989
	Primary care	Dizziness clinic	Dizziness clinic	Emergency room
Patients	100	102	2222	125
Average age	46	-	48	47
Cause, percent				
Vertigo	54	46	45	50
Benign positional vertigo	16	12	17	-
Vestibular neuronitis	4	4	10	1
Other vestibular	10	9	6	-
Central	10	7	4	7
Migraine	1	-	-	-
Nonspecific	10	10	-	-
Psychiatric disorder	16	9	21	11
Presyncope	6	4	-	14
Disequilibrium	2	16	-	1
Hyperventilation	1	23	-	5
Multicausal	13	12	-	-
Unknown	8	9	19	10

Adapted from Kroenke, K, Lucas, CA, Rosenberg, ML, et al, Ann Intern Med 1992; 117:898.

Graphic 59338 Version 1.0

Clinical features of peripheral versus central vertigo

	Peripheral	Central
Nystagmus		
Features (direction and type)	Unidirectional, fast component toward the normal ear; never reverses direction Horizontal with a torsional component; never purely torsional or vertical	Sometimes reverses direction when patient looks in the direction of slow component Can be any direction; note that purely vertical or purely torsional nystagmus is a central sign
Effect of visual fixation	Suppressed	Not suppressed
Postural instability	Unidirectional instability, walking preserved	Severe instability, patient often falls when walking
Deafness or tinnitus	May be present	Usually absent
Other neurologic signs and symptoms	Absent	Often present (eg, diplopia, ataxia, dysarthria, dysphagia, focal or lateralize weakness)

Graphic 76359 Version 8.0

Dix-Hallpike maneuver for positional nystagmus: Findings in peripheral versus central vertigo

	Peripheral disorder	Central disorder
Latent period before onset of positional nystagmus	2 to 20 seconds	None
Duration of nystagmus	Less than 1 minute	Greater than 1 minute
Fatigability	Fatiguing with repetition	Nonfatiguing
Intensity of vertigo	Severe	Less severe, sometimes none

Graphic 73213 Version 8.0

Common causes of syncope

Noncardiovascular
Reflex mechanisms
Vasovagal and vasodepressor syncope (neurocardiogenic syncope)
Micturition
Deglutition
Cough
Orthostatic hypotension
Dysautonomias
Fluid depletion
Illness, bedrest, deconditioning
Drugs - antidepressants, sympathetic blockers
Psychogenic
Hysterical
Panic disorder
Anxiety disorder
Undiagnosed seizures
Improperly diagnosed syncope - confusional states, eg, due to hypoglycemia, stroke
Drug-induced loss of consciousness (consider alcohol, illicit drugs)
Cardiovascular disease
Arrhythmic causes
AV block with bradycardia (structural changes, drugs)
Sinus pauses/bradycardia (vagal causes, sick sinus syndrome, negative chronotropic drugs such as beta blockers and calcium channel blockers)
Ventricular tachycardia due to structural heart disease
Nonarrhythmic causes
Hypertrophic cardiomyopathy
Aortic stenosis
Syncope of unknown origin
About 50 percent of patients presenting to the hospital

Major uncommon causes of syncope

Cardiovascular disease
Arrhythmic causes
Supraventricular tachycardia
Long QT interval syndrome
Idiopathic ventricular tachycardia
Myocardial infarction causing bradycardias and tachycardias
Right ventricular dysplasia
Nonarrhythmic causes
Pulmonary embolus
Pulmonary hypertension
Dissecting aortic aneurysm
Subclavian steal
Atrial myxoma
Cardiac tamponade
Noncardiovascular disease
Reflexes
Defecation
Glossopharyngeal
Postprandial
Carotid sinus hypersensitivity
Hyperventilation
Anaphylaxis
Migraine
Carcinoid syndrome
Systemic mastocytosis
Metabolic
Hypoglycemia
Hypoxia
Multivessel obstructive cerebrovascular disease

Graphic 76776 Version 1.0