

# EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER  
DEPARTMENT OF EMERGENCY MEDICINE



Care Warriors

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## Dizziness and Vomiting

A 62-year-old male with 40-pack-year smoking history presents with one hour of nausea and confusion. Patient's wife is present at bedside and is the main historian. According to her, the patient was sitting and watching T.V. when all of the sudden he began complaining of dizziness. He had one episode of non-bloody, non-bilious vomiting. He did not feel better after vomiting; in fact, his confusion has been progressively worsening over the last hour. The wife states that he has had a very similar episode five years ago and was diagnosed with "vertigo". The patient is not taking any medications and has no known drug allergies.

BP is elevated at 195/103; vital signs are otherwise within normal limits. The patient is drowsy in bed and ill appearing. There is a foul odor of vomitus. The patient responds to voice temporarily, but is disoriented. He is cooperative with physical examination, but requires redirection several times. Cardiopulmonary, abdominal and lower extremity exam reveals no abnormalities. Pupils are equal, round and reactive to light and accommodation. Which of the following is the most appropriate next step in the management of this patient?

- A. Dix-Hallpike test and 4-mg IV Ondansetron (Zofran)
- B. Obtain a thorough HPI, PMH, and surgical history from spouse
- C. Rapid neurological assessment and stat CT head without contrast
- D. Stat MRI with contrast and semicircular canal protocol
- E. CXR, 12-lead EKG, and troponin level

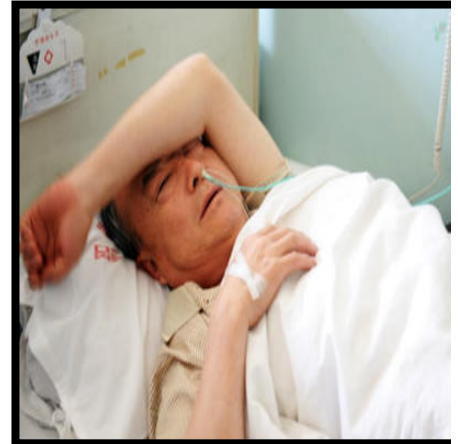


Figure 1: A pictorial description of the presenting patient. (Courtesy: <https://www.lakepowelllife.com/>)



Figure 2: Vital signs of presenting patient demonstrating hypertension. (Courtesy: <https://www.organicfacts.net/>)

*EM Case of the Week is a weekly "pop quiz" for ED staff.*

The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

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The correct answer is C. Although it is very possible that this patient is experiencing another episode of vertigo, he has several risk factors concerning for a neurological etiology of his symptoms. The patient has uncontrolled hypertension and a significant smoking history, which increases the likelihood of a stroke. Acute onset of nausea, vomiting, and decreased consciousness should be immediate triggers for a neurological evaluation.

Benign paroxysmal positional vertigo (BPPV) is a disorder of the vestibular system, which is involved in the sense of balance<sup>1-5</sup>. This condition affects 64 per 100,000 people with a predilection for females (64%) and the elderly (average age, 51-57.2 years old)<sup>1-2</sup>. In the younger population, this diagnosis is rare<sup>1-2</sup>. If diagnosed in patients younger than 35 years old, it is often in the context of post-traumatic injuries<sup>1-2</sup>.

### Discussion<sup>1-6</sup>

The presentation of BPPV is often sudden. Patients often use the term "dizzy" in their description of symptoms. This term is, in its nature, ambiguous and requires further classification and provocation of specific symptomatology from the practitioner. BPPV classically presents with an inappropriate or abnormal sensation of movement, specifically exacerbated by postural changes in head positioning. Often times, a phrase such as "feeling like the room is spinning" is used to differentiate vertigo from other causes of "dizziness". For example, cardiogenic syncopal episodes may be described subjectively as "dizziness" by the patient. Historical clarification is essential in differentiating the two. Prodromal symptoms such as palpitations and chest pain may be key symptoms that aid in clarification<sup>6</sup>. Patients might also describe hemodynamic genesis of "dizziness" as "light headedness", as opposed to the imbalance and equilibrium disturbances of BPPV.

The pathogenesis of BPPV involves the abnormal presences of calcium debris within the semicircular canal of the inner ear<sup>1</sup>. These foreign particulates cause inappropriate movement of the endolymph within the canals, causing an incorrect sensation of head movement. Nystagmus is a key provocative physical exam finding that is highly suggestive of BPPV.

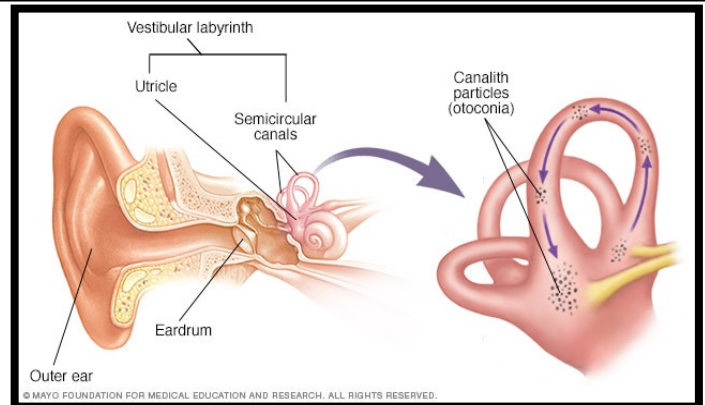


Figure 3: Diagram representation of peripheral vertigo. Canoliths (calcium debris likely originating from the utricular sacs) can be seen aberrantly floating through the endolymph of the semicircular canals. (Courtesy: <https://www.mayoclinic.org/diseases-conditions/vertigo/diagnosis-treatment/drc-20370060>)

Central vertigo often times presents in a very similar fashion to peripheral vertigo (i.e. BPPV)<sup>3</sup>. The pathology of central vertigo involves the central nervous system at the level of pons, which is where the central nuclei of the vestibular nerves live. A hemorrhagic or ischemic insult to the brain stem can cause symptoms of vertigo. Two key differentiating factors between peripheral and central vertigo exist: (1) Central vertigo is often times associated with other neurological deficits (weakness, ataxia, decreased consciousness) and (2) Peripheral vertigo can provoke rotational nystagmus with application of the Dix-Hallpike maneuver (manipulation of the head causing movement of the calcium debris in the semicircular canal).

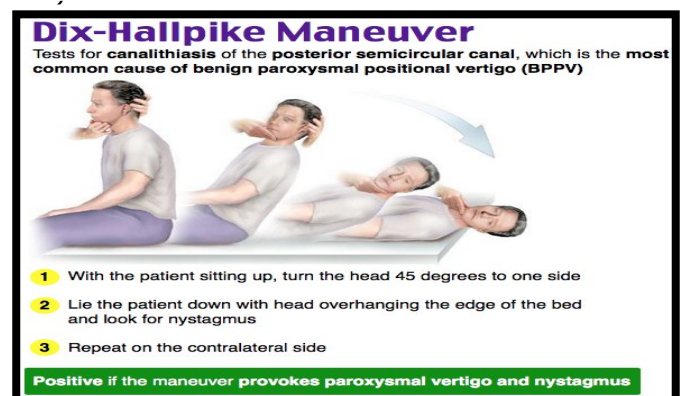


Figure 4: Diagnostic evaluation of peripheral vertigo involves manipulating the patient's head using the Dix-Hallpike Maneuver. (Courtesy: Rosh Review's Adam Rosh)

For a list of educational lectures, grand rounds, workshops, and didactics please visit [BrowardER.com](http://BrowardER.com) and click on the "Conference" link.

*All are welcome to attend!*

# Warriors

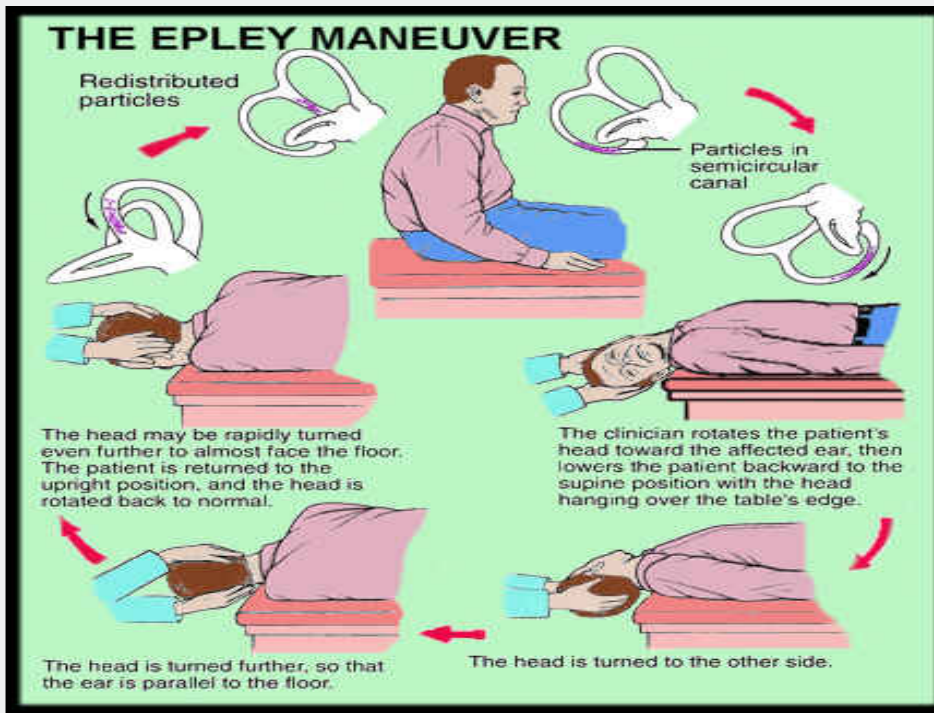


Figure 5: Instructional and visual description of the Epley maneuver: a commonly used technique to treat BPPV. (Courtesy: [https://wikem.org/wiki/Benign\\_paroxysmal\\_positional\\_vertigo](https://wikem.org/wiki/Benign_paroxysmal_positional_vertigo))

## Treatment<sup>1</sup>

Proper treatment of vertigo starts with identifying the cause of the symptoms. First, it is essential to discriminate the true symptomology of the phrase “dizziness”. The diagnostic and treatment approaches to a suspected cardiovascular syncopal episode are drastically different from true vertigo. Once true vertigo is established from a historical perspective, the differentiation of central vs. peripheral vertigo is the next major fork in the diagnostic evaluation. The presence of neurological findings suggests a central etiology of vertigo. This diagnosis will lead to a workup in search for a possible stroke (head imaging, cardiac arrhythmias, etc.). A positive Dix-Hallpike maneuver will show rotational nystagmus with positional manipulation of the patient’s head. This physical exam finding is highly suggestive of peripheral vertigo (i.e. BPPV). Treatment for this condition is directed at the pathophysiology of peripheral vertigo. The Epley maneuver involves positional manipulation of the patients head in an attempt to relocate the aberrant canalith from the endolymph of the semicircular canals into the utricular cavity.

## Take Home Points

- Acute onset of nausea, vomiting, confusion and mental status changes should spark immediate neurological evaluation, despite a known history of BPPV.
- The term “dizziness” is ambiguous in nature and should be further clarified by the practitioner with specific descriptive questions of patient’s symptoms.
- Once true vertigo is established, consideration of central vertigo as a cause is essential, as management changes drastically. Other neurological findings suggest central vertigo. Rotational nystagmus during the Dix-Hallpike maneuver suggests peripheral vertigo.
- Demonstration of Dix-Hallpike and Epley maneuvers can be visualized in video format: <https://youtu.be/59EIKztATiw> (Courtesy: Larry Mellick)



## ABOUT THE AUTHOR

This month’s case was written by Moawiah Mustafa. Moawiah is a 4<sup>th</sup> year medical student at Florida International University HWCOR. He plans to complete his postgraduate training in orthopedic surgery.

## REFERENCES

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