

## Syncope: Review Questions

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### QUESTIONS

Choose the single best answer for each question.

1. **Initial history, physical examination, and electrocardiography (ECG) can determine the cause of syncope in what percentage of patients?**

(A) 15%                      (D) 65%  
(B) 25%                      (E) 85%  
(C) 45%

2. **Which of the following is the most common cause of syncope?**

(A) Cardiac causes (eg, arrhythmias, valve disorders, ischemia)  
(B) Orthostasis  
(C) Seizure  
(D) Stroke  
(E) Vasovagal syncope

3. **All of the following statements regarding evaluation and work-up of patients presenting with syncope are correct EXCEPT**

(A) Event recording and Holter monitoring have a low yield  
(B) An electroencephalogram (EEG) is a good screening tool and should be performed routinely to rule out seizure  
(C) Electrophysiologic (EP) studies are abnormal mainly in patients with structural heart disease or an abnormal electrocardiogram (ECG)  
(D) The presence of late potentials (ie, very small, computer-enhanced electrical signals) on signal-averaged ECG (SAGE) has a high sensitivity and specificity for inducible ventricular tachycardia during EP testing  
(E) Upright tilt-table testing is useful in evaluating vasovagal syncope and is indicated in patients with recurrent unexplained syncope in whom arrhythmias are unlikely or have been ruled out

Questions 4 and 5 refer to the following case.

An 18-year-old woman presents to the emergency department with an episode of "passing-out." She states that she was having "a few beers" with friends and did not

have much to eat. She reports experiencing occasional lightheadedness while drinking alcohol, especially when moving from a supine to standing position but has never before lost consciousness. The patient last remembers getting up from a chair, and then waking up on the floor surrounded by her friends. The patient's roommate witnessed the event, and upon questioning, states that the patient may have had a seizure, as she made "jerking movements" while unconscious. The patient lost consciousness for several seconds, well under 1 minute in duration. She did not lose bladder or bowel function, did not bite her tongue, and was fairly well oriented upon awakening. She hit her head and sustained a scalp laceration. Physical examination reveals dry mucous membranes, but heart, lung, abdominal, and neurologic testing are normal. Supine heart rate is 90 bpm, which increases to 120 bpm with standing.

4. **All of the following are reasonable approaches to managing this patient EXCEPT**

(A) Measure levels of electrolytes, blood urea nitrogen, and creatinine  
(B) Obtain intravenous access and hydrate the patient with normal saline  
(C) Perform a computed tomography (CT) scan of the head  
(D) Perform a pregnancy test  
(E) Perform a urine toxicologic screen

5. **How should this patient be managed?**

(A) Admit patient to a monitored unit for observation  
(B) Admit patient to a monitored unit and perform an ECG  
(C) Admit patient to a monitored unit and perform an ECG and EEG  
(D) Discharge patient with a Holter monitor  
(E) Discharge patient after alcohol cessation counseling, and instruct her to be careful when moving from a supine to standing position

(turn page for answers)

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## ANSWERS AND EXPLANATIONS

1. **(C) 45%.** An initial assessment including a comprehensive history, physical examination, and ECG is the cornerstone of evaluation and diagnosis in patients presenting with syncope. Diagnosis of syncope can be intimidating given the number of potential etiologies and large number of tests available to the clinician, and patients are often sent for extensive testing before a simple interview is conducted. A good history, examination, and ECG can lead directly to a diagnosis in almost half of cases, making further testing unnecessary. In most of the remaining cases, the initial work-up suggests a cause and therefore directs testing appropriately.
2. **(E) Vasovagal syncope.** In a study of 822 patients presenting with syncope, the most common cause was vasovagal, or neurocardiogenic, syncope (28.7%).<sup>1</sup> In vasovagal disorders, syncope results from sudden reflex-mediated hypotension and/or bradycardia. Some common causes of vasovagal syncope include coughing, urination, defecation, anxiety, prolonged standing, and alcohol use. Even after good history, physical examination, and ECG, the cause of syncope remained unknown in 36.6% of patients.<sup>1</sup> Despite the initial predominance of unknown causes after initial assessment, it is important to note that a cause of syncope is eventually identified in over 90% of cases.<sup>2</sup>
3. **(B) An EEG is a good screening tool and should be performed routinely to rule out seizure.** EEG is very limited in patients presenting with syncope. It provides diagnostic information in less than 2% of patients, almost all of whom have symptoms suggestive of seizure or a history of a seizure disorder. In 79% of patients undergoing Holter monitoring, brief arrhythmias or no arrhythmias are found, and there is no clear link between arrhythmia and syncope or symptoms of presyncope (arrhythmias cannot be excluded in these patients).<sup>2</sup> Event monitors are significantly more likely to establish or exclude arrhythmia as a cause of syncope than Holter monitor, but they still have significant limitations (eg, lack of an event during monitoring, inability of patient to activate device). EP studies are abnormal mainly in patients with structural heart disease or an abnormal ECG. While it is true that the presence of late potentials on SAGE has a high sensitivity and specificity for inducible ventricular tachycardia during EP testing, SAGE is of limited value in a work-up. A normal SAGE may help avoid EP studies if ventricular tachycardia is the only concern; however, it is more likely that other arrhythmias are in the differential diagnosis during work-up, often necessitating EP testing. Upright tilt-table testing is useful in evaluating vasovagal syncope and is indicated in patients with recurrent unexplained syncope in whom arrhythmias are unlikely or have been ruled out.
4. **(C) Perform a CT scan of the head.** The patient seems to have vasovagal syncope based on history and physical examination. Given her use of alcohol, it is probably prudent to perform a toxicologic screen to see if any other drug use may be complicating her presentation. She clearly appears to be dehydrated on examination and therefore checking standard chemistries and obtaining intravenous access for rehydration are reasonable. Since pregnancy can also present with presyncope and syncope, it is also useful to perform a pregnancy test. Despite the presence of a scalp laceration, the utility in performing a head CT scan in this patient remains low. CT scans of the head are diagnostic in only approximately 4% of patients, almost all of whom have focal neurologic findings or a history of a seizure disorder. This patient's presentation is not consistent with a stroke, and her neurologic examination is normal. In addition, she was unconscious for only a short time, had no loss of bowel or bladder function, and had no tongue biting. Patients with syncope can have myoclonic jerking, but this is distinctly different from tonic-clonic seizure activity.
5. **(E) Discharge patient after alcohol cessation counseling, and instruct her to be careful when moving from a supine to standing position.** The treatment of syncope is very specific to the underlying cause. In this patient with vasovagal syncope, the physician should be supportive and focus on alcohol cessation, keeping well hydrated, and taking caution when moving from a supine/sitting position to a standing position. Also, if there are any presyncopal symptoms, patients should be instructed to assume a supine position immediately. In general, these actions will help to treat most patients diagnosed with vasovagal syncope.

## REFERENCES

1. Soteriades ES, Evans JC, Larson MG, et al. Incidence and prognosis of syncope. *N Engl J Med* 2002;347:878–85.
2. Kapoor WN, McAdams DJ. Syncope. In: Wachter RM, Goldman L, Hollander H, editors. *Hospital medicine*. 2nd ed. Philadelphia: Lippincott Williams & Wilkins; 2005: 423–30.