

## Syncope Extended Matching Questions

For the following questions, pick the most likely answer from the list below:

- A. Reflex syncope
- B. Orthostatic hypotension
- C. Cardiac Syncope
- D. Epileptic seizure
- E. Near-syncope
- F. Postural Orthostatic Tachycardia Syndrome
- G. Aborted sudden cardiac death

For the possible investigations choose from the following list (there may be more than one correct answer):

- A. Blood pressure, including lying and standing
- B. 12 Lead ECG
- C. Ambulatory ECG
- D. Echocardiogram
- E. Exercise Tolerance Test
- F. Reveal Device
- G. EEG

1. A 9 year old, previously fit and well boy is walking home from school. He collapses to the floor. He requires bystander CPR and two DC shocks to be

defibrillated from VF. He is admitted to the Paediatric Intensive Care Unit, where an echocardiogram shows hypertrophic cardiomyopathy. A 12 lead ECG is suggestive of left ventricular hypertrophy.

2. A 13-year-old girl, a pupil at a high achieving all-girls school, complains of a fluttering sensation in her chest. Her chest aches a little when she has these episodes. They occur when she is standing up. Her friends have commented that she looks pale, 'like a goth'. Embarrassingly, she feels a little sweaty and light-headed during these episodes. The attacks last for 10 minutes and go off gradually. She is worried she is going to pass out, but has never actually done so.

3. A slender 14-year-old girl with no known medical problems or relevant family history has been referred to your clinic as she has had several episodes of collapse. These usually occur in the morning, when she is in the kitchen making breakfast. She feels light-headed, nauseated and dizzy. Her vision narrows like a tunnel and her hearing becomes muffled. No one has witnessed these episodes of collapse, but on a couple of occasions, her mother has heard a thud and come into the kitchen to find her daughter on the floor, looking very pale and feeling clammy. She is conscious but a little confused. She is normally back to herself after about 10 minutes. The girl describes her heart racing after these events.

She has a soft systolic murmur at the upper left sternal edge. What further investigations would you consider?

4. A 17-year-old boy is desperate to join the army and is undergoing selection trials. On one of the early morning runs, he suddenly collapses, but is back to normal within 10-15 minutes. Before he is deployed, the Army doctors want him to be assessed by a cardiologist. His stepfather's cousin died suddenly at the age of 24 whilst playing football, but no cause was ever found.

After taking a full history and in the presence of a normal cardiovascular examination, what further investigations would you undertake?

5. A 12-year-old Afro-Caribbean boy presents following an episode of collapse. Upon waking, he got up to go to the toilet and then got into the shower. Whilst in the hot shower, he began to feel dizzy, light-headed and nauseated. He stumbled from the bathroom and collapsed in his mother's arms. She carried him downstairs, where he began to come round whilst she was phoning 999. During the ambulance trip, he recovered to his normal self. He was assessed in the emergency department, where his cardiovascular examination was normal. There was no significant family history. Blood pressure was normal. However, a 12 lead ECG shows 1mm ST- (J point) elevation in leads V2 and V3, thought to be early repolarisation.

6. A 14-year-old county runner is referred to you following an episode of collapse after a competitive 800m race. He remembers being pushed hard by his main rival, but has no memory of crossing the finish line. Witnesses saw him fall to the ground and become very pale. He was sweaty. Someone had the presence of mind to put him into the recovery position. They thought that his pulse was quite slow initially and then sped up. They also noticed some short-lived symmetrical jerking of all 4 limbs.

He recovered well within 10 minutes, but was taken to the local emergency department to be checked over.

Given a normal cardiovascular examination, what further investigations would you consider?

7. A 14-year-old boy, who is exceptionally active normally, collapses to the ground at the end of a mountain biking run. Shortly before his collapse, he complained to his friends of chest pain. To them, he had the appearance of being dead and they commenced CPR. Upon the arrival of the paramedics some 20 minutes later, he was found to be in VF and required two defibrillation attempts before reverting to sinus rhythm with a good cardiac output.

In the PICU, echocardiogram was normal. A 12 lead ECG showed a short PR interval and a slurred upstroke of the proximal portion of the QRS complex.

Answers

1. Aborted sudden cardiac death. This presentation and underlying disease (Hypertrophic Cardiomyopathy) are an indication for placement of an internal cardiac defibrillator, for screening of family members and consideration of a referral to clinical geneticists.

Diagnosis: G; Investigations: D

2. This history could be consistent with Postural Orthostatic Tachycardia Syndrome, but there is some overlap with Orthostatic and Reflex mechanisms in the context of prolonged standing. Measuring heart rate or performing a 12 lead ECG on standing may aid in the diagnosis of POTS if tachycardia is present. However, there are currently no particular diagnostic criteria for this condition as yet.

Diagnosis: F; Investigations: B

3. This history is most likely consistent with reflex syncope. In the presence of a normal echocardiogram (done as clinical evidence of a murmur) and normal 12 lead ECG, this patient could be reassured and given advice on appropriate hydration and physical manoeuvres to undertake that may abort the episodes of syncope.

Diagnosis: A; Investigations: B

4. This history is concerning for a cardiac cause of syncope. However, it is possible for reflex syncope to occur during exercise. This should only be a diagnosis of exclusion following thorough investigation. Key features in the history would include: chest pain prior to collapse and a family history of sudden cardiac death or channelopathies. A 12 lead ECG is mandatory. An echocardiogram and/or further imaging would be indicated in this case to confirm the normal course of the coronary arteries. Exercise testing is mandated.

Diagnosis: C; Investigations: B, D, E

5. This history is consistent with reflex syncope, although again there may be overlap with orthostatic hypotension. The ECG changes are likely a normal variant and not pathological. Further investigation is probably not warranted, but may be required if there is sufficient anxiety on the part of the investigating doctor or the parents!

Diagnosis: A; Investigations: B

6. This history is most consistent with reflex syncope. In the absence of a significant family history, and presence of a normal cardiovascular examination and normal ECG, the patient and family could be reassured and discharged.

Diagnosis: A; Investigations: B

7. This is an example of cardiac syncope and aborted sudden cardiac death. The underlying diagnosis is consistent with Wolf-Parkinson-White syndrome (characteristic ECG changes plus symptoms). However, sudden cardiac death is only a very rare complication of this condition and especially so in the paediatric population. There are promulgated guidelines, subject to some debate, that offer guidance on when a radio frequency ablation of the accessory pathway should be offered.

Diagnosis: C and G; Investigations: In asymptomatic WPW, C and E