

APPENDIX 1. Historical Features Associated With Each Type of Syncope

TYPE OF SYNCOPE	COMMON FEATURES ON HISTORY
Neurally-mediated syncope	
Vasovagal syncope	<p>Precipitating factors: Emotional distress, fear, pain, prolonged standing, warm or crowded area, post-exertion</p> <p>*Prodrome: Abdominal pain, diaphoresis, nausea, blurred vision, dizziness, lightheadedness, vertigo, slow pulse</p> <p>Post-syncope: Fatigue, nausea, vomiting</p> <p>Previous history: History of frequent and prolonged syncopal events</p>
Situational syncope	<p>Precipitating factors: Activities such as coughing, defaecation, eating, laughing, urination</p>
Carotid sinus syndrome	<p>Unexplained fall</p> <p>Precipitating factors: Head movement, shaving, tight collar</p>
Orthostatic hypotension-related syncope	<p>Precipitating factors: Sudden change in position, particularly standing up from sitting or lying; prolonged standing; deconditioning secondary to prolonged bedrest Drugs: alcohol; antihypertensives, antidepressants, calcium channel blockers, antidiabetic agents</p> <p>Prodrome: Blurred vision, dizziness, lightheadedness, vertigo</p> <p>Previous history: Alcoholism, diabetes, Parkinson's disease, renal replacement therapy, older age with dementia</p>
Cardiac syncope	
<ul style="list-style-type: none"> • Arrhythmia • Structural heart disease • Prolonged QT interval 	<p>Position: May occur while supine</p> <p>Precipitating factors: Exertion or post-exertion Medications: anti-arrhythmic, tricyclic antidepressants, macrolides, antiemetics, antipsychotics Unexplained fall</p> <p>Prodrome: Chest pain, dyspnoea, fluttering or palpitations, slow pulse, no prodromal symptoms associated with vasovagal syncope*</p> <p>Post-syncope: Immediate complete recovery, slow pulse</p> <p>Previous history: Heart disease, older age with dementia, family history of sudden cardiac death</p>
Psychogenic pseudosyncope	
<ul style="list-style-type: none"> • Apparent but not true loss of consciousness • Occurs in absence of cardiac, neurally-mediated, neurological or metabolic causes 	<p>Eyes closed during event</p> <p>Post-syncope: Immediate complete recovery</p> <p>Previous history: History of frequent and prolonged syncopal events, psychiatric illness</p>
Convulsive syncope	
<ul style="list-style-type: none"> • Any form of syncope that occurs with convulsive-like movements (jerks, spasms) 	<p>Fixed gaze, upward eye deviation, convulsive activity usually brief < 1 min (most common = myoclonus), pallor. Note: tongue biting <i>not</i> common.</p> <p>Position: Not usually supine</p> <p>Prodrome: Warmth, sweating, presyncope</p> <p>Post-syncope: Nausea, mild confusion (brief), fatigue</p>

*Note: Older adults may not have prodromal symptoms with vasovagal syncope.

Sources: 1) Runser LA, Gauer RL, Houser A. Syncope: evaluation and differential diagnosis. *Am Fam Physician*. 2017;95:303-12; **2)** Brignole M, Benditt D.G. *Syncope: an evidence-based approach*. London, UK: Springer; 2011; **3)** Shen WK, Sheldon RS, Benditt DG, et al. 2017 ACC/AHA/HRS guideline for the evaluation and management of patients with syncope: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. *Circulation*. 2017;136:e60-e122; **4)** Sheldon R. How to differentiate syncope from seizure. *Cardiol Clin*. 2015;33:377-85.

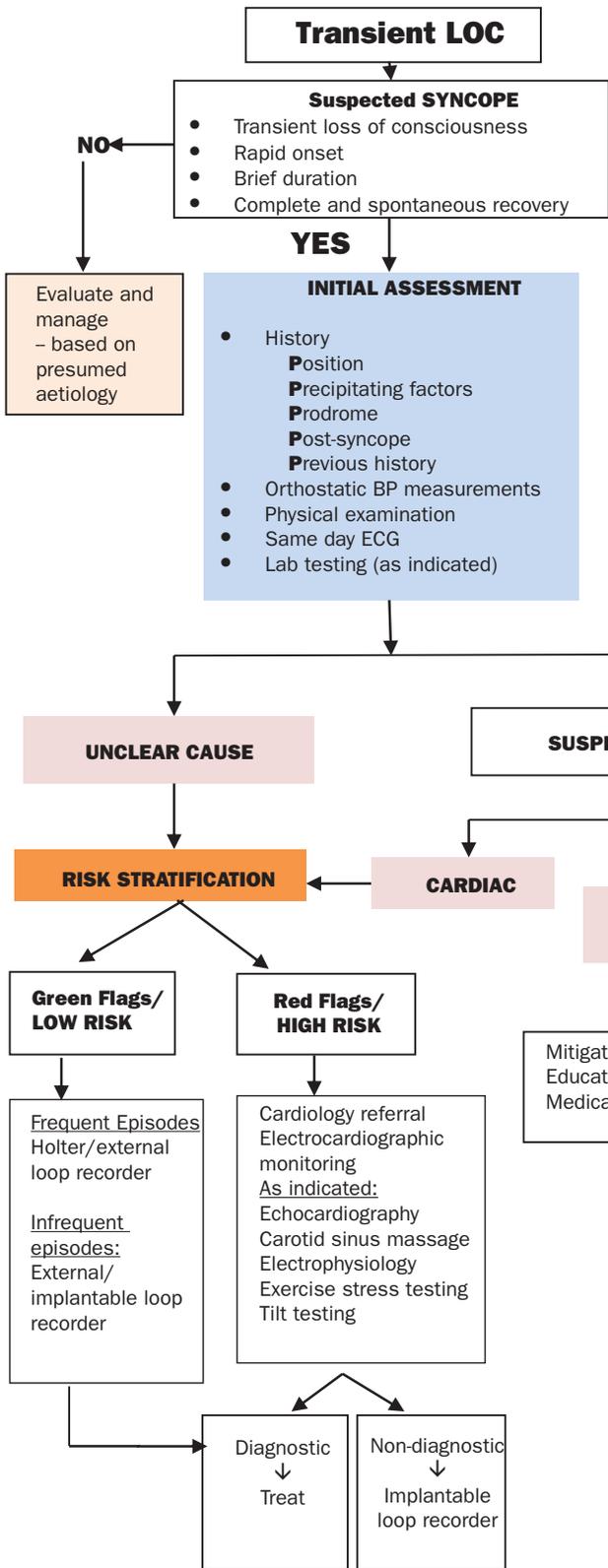
APPENDIX 2. Assessment of Syncope in Adults*

RISK STRATIFICATION	
<p>RED FLAGS (High Risk)</p> <ul style="list-style-type: none"> • Syncope while supine, during exercise, with preceding palpitations or with brief or no prodrome. • Older age > 60 years. • Family history of early sudden cardiac death (< 50 years). • History or sign of cardiac disease (e.g., severe aortic stenosis, MI, CHF, outflow obstruction). • Hypotension (SBP < 90 mmHg). • Abnormal ECG. • Bradyarrhythmia, tachyarrhythmia, abnormal QT interval, conduction defects: Brugada syndrome (RBBB with ST segment elevation leads V₁-V₃); 2nd or 3rd degree heart block, ischemic changes. • Serious comorbidities:(e.g., electrolyte imbalance, anaemia). 	<p>GREEN FLAGS (Low Risk) REASSURING FEATURES</p> <ul style="list-style-type: none"> • Younger age (< 50 yrs). • No known cardiac disease. • Syncope when standing or with positional change from supine to sitting or standing. • Typical prodrome. • Specific triggers (e.g., dehydration, pain, stress, tight collar). • Situational triggers (e.g., cough, laugh, micturition). • Frequent recurrence and prolonged history of syncope with similar characteristics. • Normal ECG. • Unremarkable CV examination.

Red flags: Require management in hospital setting or urgent cardiac assessment

Green flags: May be managed in outpatient setting.

Sources: 1) Runser LA, Gauer RL, Houser A. Syncope: Evaluation and Differential Diagnosis. *Am Fam Physician.* 2017;95:303-12; **2)** Shen WK, Sheldon RS, Benditt DG, et al. 2017 ACC/AHA/HRS Guideline for the Evaluation and Management of Patients With Syncope: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. *Circulation.* 2017;136:e60-e122; **3)** Sheldon RS, Morillo CA, Krahn AD, et al. Standardized approaches to the investigation of syncope: Canadian Cardiovascular Society position paper. *Can J Cardiol.* 2011;27:246-53.



APPENDIX 3. The Glasgow bin lorry crash

On the 22nd of December 2014, the driver of a Glasgow City council bin lorry lost consciousness at the wheel. The lorry was out of control for 19 seconds resulting in the tragic death of 6 people and a further 15 people were injured, some seriously.

The resultant Fatal Accident Inquiry (FAI) was published in December 2015, and the driver faced both a private prosecution from the families of the deceased and a separate prosecution for a separate driving offense.

This appendix is an attempt to summarize the key learning for doctors from the FAI, but cannot cover all the intricacies of the inquiry itself. It should however be noted that the key medical experts, at times, disagreed ... and the DVLA has subsequently made changes to the 'At a Glance' guidance. The DVLA was also recommended to change its policy on notification of fitness to drive from 3rd parties such as the police, whether or not it comes in written form.

The GMC completed a consultation into the 'Confidentiality' Advice to make reporting concerns to the DVLA clearer. There were recommendations made to the Secretary of State for Transport to instigate a consultation on how best to ensure the completeness and accuracy of the information available to the DVLA in making fitness to drive decisions with a view to making legislative change.

Key Learning for Primary Care clinicians:

Medical record keeping.

During the case, the bin lorry driver's medical records were forensically examined. While most GPs have improved medical record keeping in recent years since computerized notes, there are unlikely to be many who would be prepared for the level of scrutiny that was undertaken. The case highlighted the following as areas for improvement:

- a. Coding of occupational drivers - these are not usually coded at present by primary care
- b. Recording of fitness to drive advice - this is seldom coded
- c. Clinical entries such as "wry neck", "dizzy", "TATT" were thought to be lacking any recorded "fitness to drive" advice, which may have been relevant.
- d. Vasovagal episodes and recurrent disabling dizziness (coded as priority Read codes) had problems when transferring from paper to computer records.

There was some disagreement between the medical professionals as to whether a simple faint should be coded in the medical records. However the recommendations from the enquiry state:

"Doctors generally, and general practitioners in particular, should take steps to ensure that medical notes are made in such a way as to maximise their ability to identify repeated episodes of loss of consciousness, loss of or altered awareness, in patients who are (or may become) drivers."

D4 medical reports ("HGV medicals") for Group 2 licences

The enquiry focused on an occupational health report and a GP report that had conflicting information regarding the circumstance of an episode of collapse. However it should be noted that the driver sought to conceal the evidence from the doctors in question and may have deliberately misled the GP. The recommendations for doctors were as follows:

- a. Where possible, the doctor completing the D4 medical should have access to the medical records.
- b. In this case, the paramedics attended the driver in a previous incident collapsed at the wheel of bus - but no records of their assessment had been sent to the GP. The patient lied and said he had fainted in a hot cafeteria. The GP passed him as fit to drive, and the occupational health department did not notice the discrepancy between the accounts.

Advice for clinicians is as follows:

"When a doctor is advising an organization employing a driver as to that driver's fitness to drive following a medical incident whilst driving, that organization should provide all available information about the incident to the doctor, and the doctor should insist on having it prior to giving advice to the organization and the driver".

APPENDIX 3. cont'd The Glasgow bin lorry crash

- c. Whilst it is easy with hindsight to suggest that the GP who knows the patient best should be the one who completes the medicals, in this case the GP was on annual leave. Therefore the HGV medical was completed by another doctor who had not seen the patient before.

DVLA medicals

The enquiry focused heavily on an episode in 2010 when there had been a previous incident. At the time, the patient was driving a bus and he apparently collapsed at the wheel. The passengers got off the bus, paramedics attended, but he declined admission to hospital and went to see his GP.

The suggestion is that the driver would not have received a Group 2 licence after his subsequent HGV medical if the collapse at the wheel of a bus been disclosed. During the enquiry there was much discussion about the 3 Ps' mentioned in info point 18 of this module:

- whether there was sufficient prodrome as he had been able to stop the bus safely prior to the collapse. If it was considered that he had a reliable **prodrome**, he may have been allowed to continue driving.
- **posture** - he was sitting down when he collapsed, and
- **provocation** - he did in fact have previous dizziness and wry neck recorded in his notes.

The diagnosis was found to be neutrally mediated syncope in this case. The driver of this vehicle applied and was granted his Class 2 license again four months after the tragic events in Dec 2014. This was revoked by the DVLA after evidence from the FAI highlighted that he had lied about the previous episode in 2010.

[Expert reviewer's comment: Note that the Driving Assessment Centre in Edinburgh (the SMART Centre) does **not** do assessments for Group 2 licences].

VASOVAGAL and SITUATIONAL SYNCOPE

What is syncope?

Syncope is a medical term for what is commonly known as fainting. It is a sudden, brief loss of consciousness and occurs when not enough blood flows to the brain; which results in the person fainting (going limp and falling down). Usually after they fall down, the blood flow to the brain rapidly improves and most people recover quickly from the episode. Most syncope is not caused by any underlying serious illness.



Vasovagal syncope (also called “reflex syncope”) is the medical term used to describe a specific type of syncope in which your body over-reacts to a trigger (such as pain, emotional distress, fear). As a result there is a rapid drop in your blood pressure and heart rate. Not enough blood gets to your brain and you faint. Vasovagal syncope is not dangerous. Some ways to help avoid fainting are listed below.

In **situational syncope** the process is the same but the triggers are bodily functions such as coughing, urinating, straining, laughing.

How can you avoid fainting?

- Avoid sitting or standing for long periods.
 - When you do have to stand still for a long time, clench and unclench your calf muscles, or rock forward and back on the balls of your feet to promote blood flow.
 - If sitting for a long time, cross legs and gently tighten leg or gluteal muscles. Do this before standing.
- If possible, avoid situations that cause you to faint (e.g., large crowds, warm places). If you are unable to avoid these situations, see the section below for how to manage when you feel you are about to faint.
- Do not stand up or sit down or bend over suddenly. Take pauses when you are changing positions.
- Drink plenty of fluids to avoid dehydration.
- Avoid excess alcohol.



What to do if you are about to faint?

You may know that you tend to faint at certain times, such as when you have an injection or get blood taken. You may also have feelings of warmth, dizziness, sweating, or being sick to your stomach just before you faint. Here are some steps you can take to help avoid fainting:

- Sit down immediately. Put your head between your knees.
- If possible, lie down flat and raise your legs against a wall.
- In milder episodes tense and untense your stomach, arm and leg muscles. You can try squatting or leg crossing to stop the symptoms from getting worse.



What to tell family and friends to do when you faint?

- Loosen any tight clothing around the neck.
- Keep you lying down for about 10 minutes – preferably in a cool and quiet space with feet elevated about 30 centimeters.
- If any vomiting, turn onto side to prevent choking.
- If any trouble breathing or taking longer than expected to get better, call 999.



When should you contact your doctor?

- You are unable to prevent fainting and continue to have fainting episodes.

Call 999 if you have symptoms of a possible heart problem (e.g., chest pain or pressure, severe trouble breathing, a fast or irregular heartbeat).

Sources: **1)** MyHealth.Alberta.ca Network. “Fainting.” Available at: <https://tinyurl.com/ycequtau>. **2)** Falls and Syncope Service Royal Victoria Infirmary. The Newcastle Upon Tyne Hospitals. “Information for patients with vasovagal syncope.” Available at: <https://tinyurl.com/y9pty44f>; **3)** MyHealth.Alberta.ca Network. “Vasovagal syncope: care instructions.” Available at: <https://tinyurl.com/ychfqfgz>.