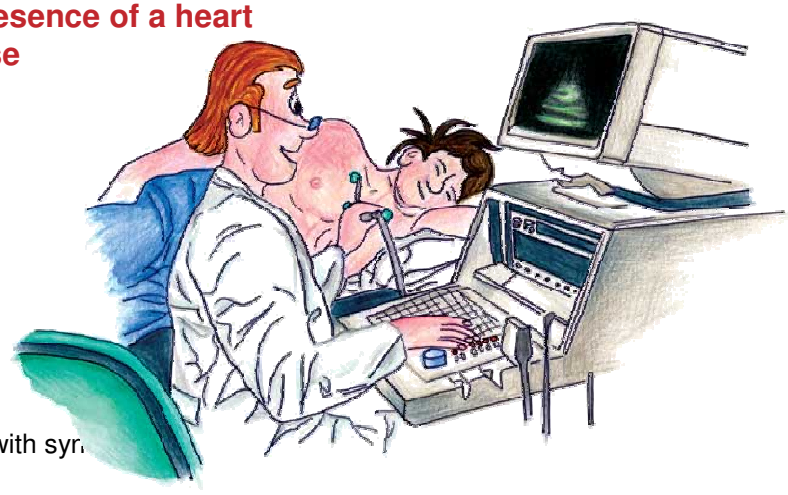
During the test, the patient lies down on a bed and is secured to it with special belts; the bed can be raised from a horizontal to a vertical position. Arterial blood pressure and heart rate are closely monitored during the whole test.

The test is divided into two stages: during the first stage (non-pharmacological step), the patient has to remain on the bed for at least 20 minutes, with the bed inclined at an angle of 60 degrees; during the second stage, which lasts a maximum of 15 minutes, the patient is given a drug to activate the syncopal reflex (pharmacological step). The drugs used are nitroglycerin (a vaso-dilating drug commonly used to treat heart attacks), which is administered under the tongue by means of a spray, or isoproterenol (a drug that stimulates the heart rate), which is injected into a vein.

Echocardiogram. The echocardiogram provides very accurate images of the heart and detects possible structural

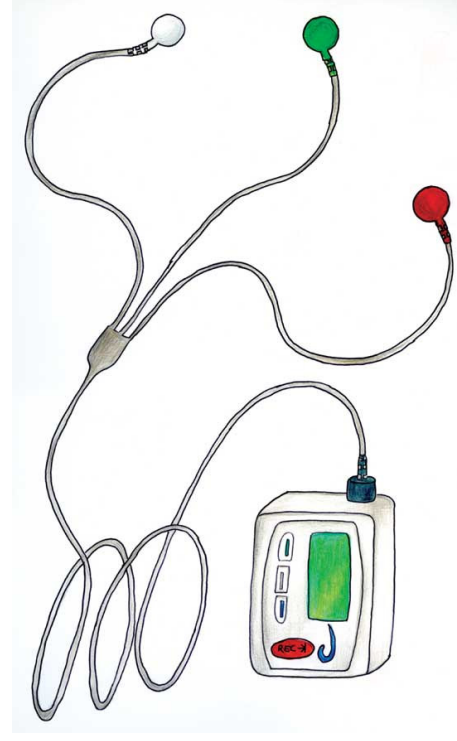
The echocardiogram is a basic test for detecting the presence of a heart disease



abnormalities in the heart muscle, valves and vessels. It is a very important non-invasive test used to detect and/or exclude any possible heart disease.

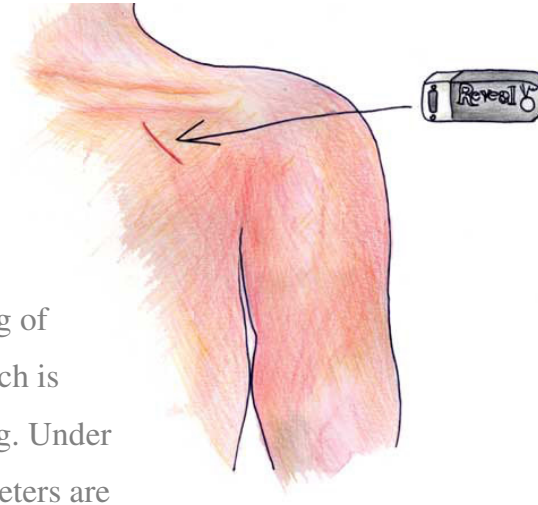
Extended electrocardiographic monitoring. This is used to evaluate the behaviour of the heart beat during spontaneous syncope. This test is recommended when an arrhythmic cardiac syncope is suspected. Various devices are used, according to the frequency of the syncopal episodes:

- *Holter*: electrodes are applied to the patient's skin and connected to a portable recorder to monitor the electrocardiogram for 24-48 hours;
- *External loop recorder*: this is similar to the Holter and enables the electrocardiogram to be monitored for up to four weeks;



An external loop recorder monitors the patient for several days.

Implantable loop recorder: a very small electrocardiographic recorder (the size of a cigarette lighter) is implanted under the skin just to the left of the breastbone through a small cut under local anaesthesia; it enables the patient to be monitored for up to two years.



An implantable loop recorder (with its external activator) monitors the patient for several months.

Electrophysiological study,
This is used to evaluate the working of the heart's "electrical system", which is responsible for correct heart beating. Under local anaesthesia, two or more catheters are inserted into groin veins through the skin and then into the heart, where they record the heart's electrical signals. This invasive test must be carried out during hospitalisation and helps us to understand whether syncope is due to a heartbeat disorder (arrhythmic syncope).
Further tests. In some selected patients, other tests are used to study syncope. These include blood tests, electroencephalogram, echo-Doppler of the neck arteries, cerebral CAT and cerebral nuclear magnetic resonance.

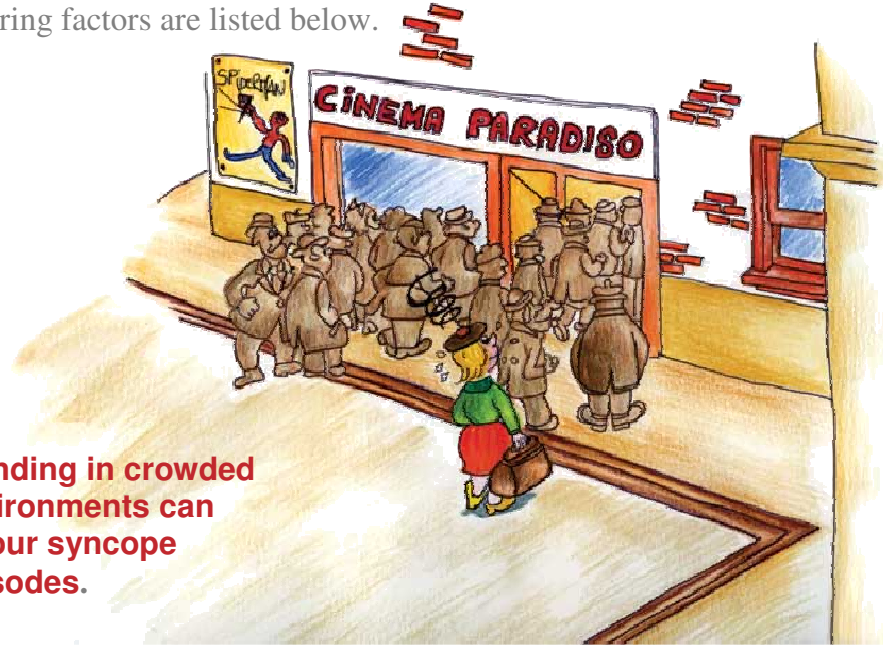
How to prevent syncope

Is it possible to prevent syncope?

It is possible to prevent syncope by avoiding the so-called "triggering factors" and by adopting simple preventive measures. General preventive measures are valid for all types of syncope, while specific preventive measures are adopted for each single type of syncope. Preventive measures are most effective in neuromediated and orthostatic syncope.

What are the "triggering factors"

Some environmental and physical conditions can trigger or favour syncopal episodes. These conditions must therefore be avoided as far as possible. Useful suggestions for avoiding triggering factors are listed below.



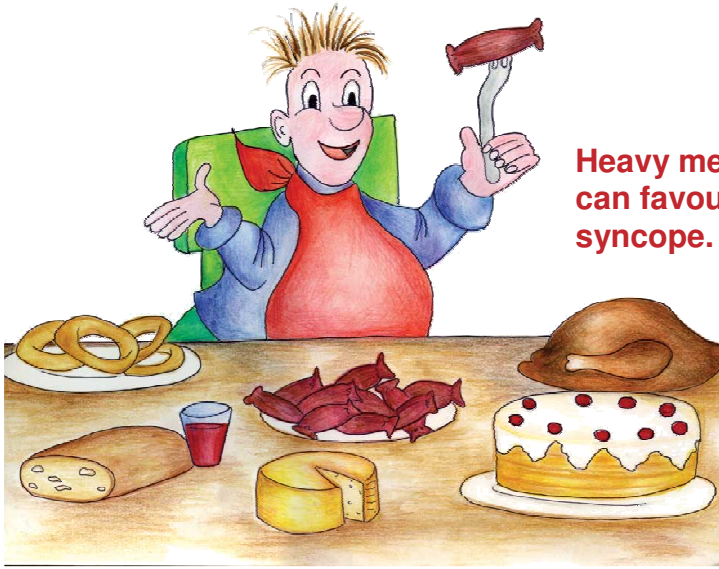
Standing in crowded environments can favour syncope episodes.

Useful suggestions for avoiding “triggering factors”

- **Avoid standing or sitting for a long time,** especially in warm, crowded places with insufficient ventilation
- **Avoid hot environments,** such as bathrooms, showers and saunas; high temperatures favour the decrease in arterial blood pressure and, therefore, syncope.
- **Avoid ice-cold drinks**
- **Avoid alcohol abuse:** as alcoholic drinks lower the arterial blood pressure, they can worsen symptoms.

Ice-cold drinks can favour syncope

Drinking spirits can favour syncope.



Heavy meals can favour syncope.

Do not eat too much during meals: heavy meals can lower the arterial pressure considerably.

- **Do not use drugs**
- **Be careful with some medicines**: some medicines, such as those used to treat high blood pressure, can favour syncope episodes. If you are taking these medicines, inform your doctor and ask if it is possible to replace them with safer medicines.
- **Do not take medicines which your doctor has not prescribed** (including herbal medicines and infusions)
- **Avoid intense physical effort**, especially in muggy environments and if you are wearing unsuitable clothes.

Sports activities done when the temperature is high and while wearing unsuitable clothes can favour syncope.

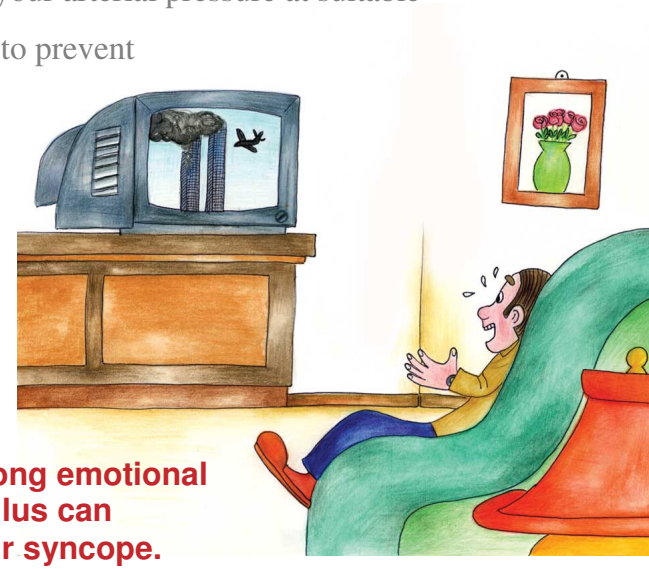
- **Avoid situations that cause stress**, whether physical or emotional.
- **Do not change posture too quickly**: when you have been lying down, or when you have been sitting for a long time, stand up slowly, especially in the morning, when blood pressure tends to be lower.
- Whenever you have to have an injection or undergo any other invasive procedure, inform your doctor of any possible syncope risk.

Standing up too quickly can favour syncope

What are general preventive measures?

General preventive measures consist of adopting simple behaviours that help to keep your arterial pressure at suitable levels and can therefore help to prevent syncopal episodes.

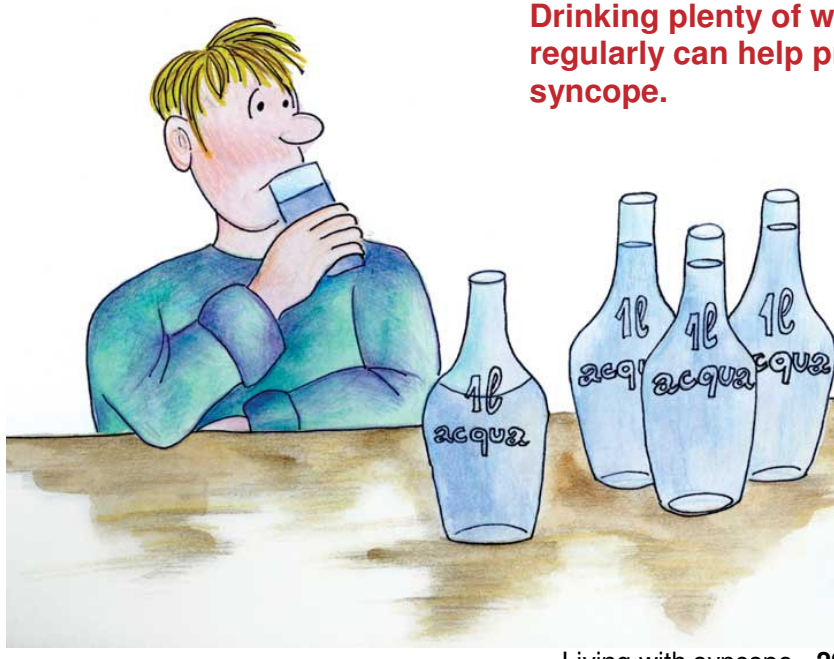
However, such measures must be adopted only after you have discussed them with your doctor. The main general preventive measures are listed below.



A strong emotional stimulus can favour syncope.

General preventive measures

- Drink plenty of water: it is very important to drink water often, especially during physical exercise and when the weather is warm. You need to increase your daily liquid intake to 2 or 3 litres (mainly by drinking water – at least 500 ml – in the morning and/or before possible situations that can trigger or favour syncope). Check that your urine is always abundant and clear in colour.
- Drink tea or coffee (do not exceed 4-6 cups a day): caffeine, which is contained in both tea and coffee, helps to keep your arterial pressure at acceptable levels.



Drinking plenty of water regularly can help prevent syncope.

Eating food rich in salt can help prevent syncope.

Increase your salt intake: take 7-14 gr. (2-3 coffee spoons) of common salt per day both by eating foods that already contain salt and by salting your food. However, this preventive measure must first be discussed with your doctor, especially if you suffer from a heart disease or high blood pressure. Foods rich in salt are: sausages, cheese, canned food and preserves under oil.

- **Wear support stockings**: wearing support stockings during the day helps to prevent blood from gathering in the legs (this measure is very important for patients affected by venous failure).
- **Tilt training (training for orthostatism):** stand for at least 30 minutes a day with your upper back against a wall, with your feet close together about 20 cm from the wall. Doing this exercise every day "trains" the body to tolerate extended orthostatism (i.e. standing for long periods) and helps prevent syncope.

- **Head-up sleeping:** sleep with your head raised at least 10 degrees from the horizontal. To do so, use some books or bricks to raise the head of the bed by a few centimetres.
- **Take moderate physical exercise:** brisk walking for at least 30 minutes a day, or swimming, jogging, and moderate cycling two or three times a week for at least 30-40 minutes each time. After intense exercise, remember to "wind down", especially if you are on cardiovascular medicines. It is important not to suddenly interrupt the physical effort; slow down gradually for a few minutes before stopping.

Moderate physical exercise can help prevent syncope.

Specific preventive measures

Vasovagal Syncopes

The following tactics can help reduce the occurrence of vasovagal syncope episodes:

- if you have to stand or sit for a long time, periodically tense your calf and thigh muscles or raise yourself on tiptoe in order to keep arterial blood pressure at proper levels;
- if you have to have intravenous injections or undergo other invasive procedures, tell your doctor that you are prone to vasovagal syncope and have the procedure done when you are lying down.

Carotid sinus syncopes

Considering the mechanism that causes the loss of consciousness, it is recommended that you avoid any situation that can unintentionally exert pressure on the carotid sinus (i.e. excessive pressure on your neck):

- ties or shirt collars must not be too tight;
- do not press too hard while shaving;
- do not turn your neck or head too far round.

Avoiding pressure on the neck can prevent carotid sinus syncope.

Situational syncopes

The following tactics can help reduce recurrent episodes of situational syncope:

- if syncope tends to occur while defecating, use laxatives to treat constipation;
- if syncope tends to occur while urinating, urinate in a sitting position;
- if syncope tends to occur while swallowing, chew your food well and avoid swallowing large mouthfuls of food or ice-cold drinks;
- if syncope tends to occur while coughing, give up smoking and/or use medicines to prevent coughing;
- if syncope tends to occur after meals, eat small quantities of food more often during the day.

Orthostatic syncopes

Considering the mechanism that causes the loss of consciousness, it is recommended that you move from a lying-down to a standing position as follows:

- do some physical exercises with the arms and legs while still lying;
- then sit for a few minutes and repeat the exercises;

Doing physical exercises in the morning before getting up from your bed can help prevent orthostatic syncope.

- stand up very slowly and carefully, and be ready to sit again in the event of premonitory symptoms;
- if you have to stand or sit for a long time, periodically tense the calf and thigh muscles or raise yourself on tiptoe in order to keep arterial blood pressure at proper levels.

Cardiac syncopes

The following tactics can help reduce recurrences in patients suffering from cardiac syncope:

- relax immediately if angina (i.e. chest pain), palpitations (i.e. faster heartbeats) or dyspnoea (i.e. difficulty in breathing) occurs;
- in the case of angina, take sublingually administered anti-angina medicines only when lying down;
- avoid very intense physical and emotional efforts.
- finally, when patients with heart disease experience a syncopal episode, they must immediately go to the hospital emergency unit and inform their doctor.

Cerebrovascular syncopes

In the syncope caused by “brachial-basilar insufficiency syndrome”, any physical effort involving the arms must be made with caution.

How to interrupt syncopal episodes

Is it possible to interrupt a syncopal episode?

It is possible to interrupt a syncopal episode and to avoid the complete loss of consciousness and/or related injuries by learning how to recognise premonitory symptoms, by lying down and by adopting the so-called physical countermoves.

What are the premonitory symptoms?

The premonitory symptoms are a warning that syncope is about to occur. These symptoms, which patients must learn to recognise, are: a general feeling of being unwell, weakness, nausea, digestive disorders, visual disorders, sweating, paleness, palpitations, light-headedness, dizziness, chest pain.

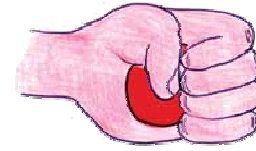
Why is it necessary to lie down?

When a patient has premonitory symptoms and the feeling of impending loss of consciousness, he/she must immediately lie down (and, if possible, raise his/her legs, e.g. by propping them up against a wall). Never stand up in an attempt to overcome the symptoms; if you fall, you may be injured. The patient must lie down until he/she feels better (i.e. for at least 5-10 minutes). Attempts to stand up or sit before this time

could cause a new syncopal episode. If you cannot lie down, at least crouch down.

What are the physical countermoves to be adopted?

If you have some premonitory symptoms but cannot easily lie down, you can try to adopt the following physical countermoves for a few minutes; these increase arterial blood pressure and interrupt the syncopal episode, and are designed to avoid vasovagal and orthostatic syncope episodes:



- cross your legs and actively tense your muscles;
- fold your hands and pull them firmly;
- squeeze an “anti-stress” ball.

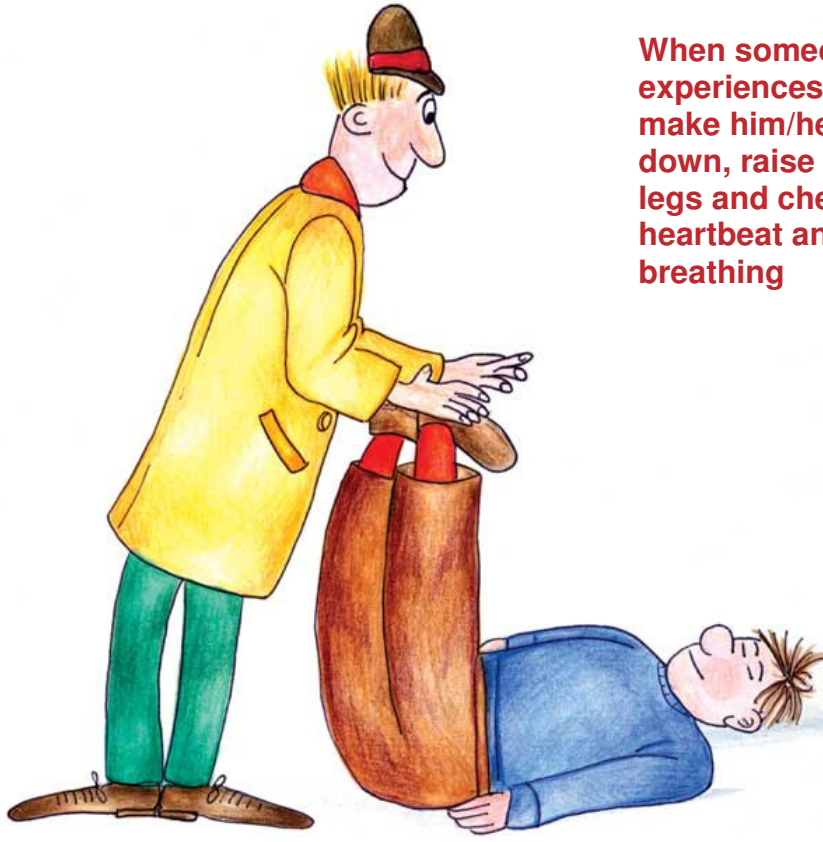
If such moves fail (i.e. if premonitory symptoms are not interrupted and the subject still feels ill), the patient must immediately lie down.

Physical countermoves performed when the first symptoms occur can interrupt vasovagal syncope episodes.

How to behave during a syncopal episode

What should we do when a syncopal episode occurs?

During a syncopal episode, friends and relatives must not try to keep the patient standing or sitting, but must let him/her lie down and raise his/her legs. The patient must not be given drinks of any kind, especially alcohol. It is important that heartbeat and breathing be spontaneous.



When someone experiences syncope, make him/her lie down, raise his/her legs and check for heartbeat and breathing

If no heartbeat and/or breathing can be detected within a few seconds after loss of consciousness, an ambulance must be called immediately and resuscitation started. This is not a syncope but a cardio-respiratory arrest.

It is vital that people around the patient carefully observe him/her in order to report the following information to the doctor: skin and mucosa colour (pale or congested); sweating; bowel incontinence; unconscious movements of the body and limbs; consciousness recovery time; temporary neurological deficits (mouth pulled to one side, inability to move legs and arms, derangement).

Telephone number of the emergency services.

The emergency service must be alerted if an unconscious patient does not show heartbeat or spontaneous breathing

How to behave after a syncopal episode

What should we do after a syncopal episode?

Immediately after a syncopal episode has occurred, the patient must be taken to the nearest hospital emergency unit in the following cases:

- if this is the first syncopal episode;
- if he/she has suffered severe injury;
- if he/she is known to suffer from a heart disease;
- if he/she is an elderly person and/or has related diseases;
- if he/she shows abnormally slow recovery after loss of consciousness, reports chest pain, has difficulty in breathing, is unable to speak properly and/or move one or more limbs properly.

In all other cases, the patient does not need immediate assistance and can see his/her doctor afterwards.

When syncope episodes are considered severe from a clinical point of view, a specialised centre must be contacted.

Are periodic check-ups necessary?

If the diagnosis is one of cardiac or cerebrovascular syncope and the patient has been implanted with a pacemaker or defibrillator, or has undergone transcatheter ablation or surgery, periodic check-ups must be planned. Otherwise, if the diagnosis is one of neuromediated or orthostatic syncope, further check-ups are necessary only in the case of frequent syncopal episodes or of intolerance to the treatment given.
In any case, for treatment to be successful, you must:

- always inform your doctor of any new syncopal episodes and of any side effects caused by the therapy given;
- clarify any possible doubt about the diagnosis and the treatment, together with your doctor.

How should we behave in everyday life?

Once the cause of syncope has been established and proper treatment has been given, the patient can lead a normal life. In most cases, it is not necessary to limit one's usual working activities and relationships.

Are there any problems associated with driving?

Syncope episodes very rarely cause road accidents. For patients suffering from syncope, there are therefore no particular restrictions on driving, especially if syncopal episodes are rare, clinically benign or not related to any cardiac disease. In all other cases, the cause of the syncope must be ascertained before the patient resumes driving, and specific treatment to prevent recurrences must be started. However, authorisation to drive public transport vehicles must be carefully evaluated by the doctor.

A patient with syncope can generally drive a car for personal use, while authorisation to drive public transport vehicles must be granted by the doctor

Patients who have undergone pacemaker implantation or transcatheter ablation must wait at least one or two weeks before driving again, while those who have undergone defibrillator implantation must see their cardiologist to establish whether and when they can drive again. Finally, if the patient has undergone surgery, the surgeon must establish when driving can be resumed.

Is there any problem concerning the practice of sports activities?

If a patient with syncope is affected by a heart disease, any possible restrictions on sports activities will be determined by the heart disease itself. Those without heart disease are allowed, and even recommended, to take moderate aerobic physical exercise. They can even take part in competitive sports if these do not cause particular problems. Risky sports, however, such as motor racing, diving and climbing, are to be ruled out.

Further information

For further information or questions concerning the content of this guide, please contact:

Syncope is a temporary loss of consciousness and postural tone. It may be experienced by anyone, whether young or old, healthy or sick. Indeed, we are all likely to experience at least one episode of syncope at some time in our life.

When syncope is not related to heart disease, it is generally regarded as benign. However, if a patient is suffering from heart disease, syncope may be a premonitory symptom of a fatal event, such as heart attack or even sudden death. It is therefore important not to underestimate the clinical meaning of the symptom.

Drawn up by a pool of experts, this guide aims to provide use ful support for doctors, patients and their relatives, in order opti mise the clinical management of syncope.