



# *Syncope*





# *Introduction*

## **What is syncope?**

Syncope (SING-kuh-pee) is a medical term for fainting. When you faint, your brain is not receiving enough blood and oxygen, so you lose consciousness temporarily.

## **How common is syncope?**

Syncope is a common problem. Approximately one million people are evaluated and treated for syncope in the United States each year. Since syncope can occur without warning, up to a third of the people who have syncope also have injuries related to falling or other accidents.

## **How does syncope affect people?**

Some people have infrequent episodes of syncope that do not interfere with their lives. Others have repeated episodes, and for nearly a third of these people, the cause remains undetermined and untreated. They may have difficulty performing everyday activities such as working or driving a car. These changes to their lifestyles may then lead to other problems such as anxiety or depression. Untreated syncope especially affects older people because they frequently have injuries during episodes. However, most causes of syncope can be identified and treated.

## **Heart specialists and syncope**

Syncope is often related to heart disease, so it is common for people with syncope to receive medical care from heart specialists. Cardiologists are physicians who specialize in the diagnosis and treatment of heart disease. Electrophysiologists are cardiologists who specialize in the diagnosis and treatment of syncope and problems related to heart rhythms.

The rhythm of your heartbeats is important. To pump blood efficiently, your heart muscles must contract and relax in a coordinated manner at a proper rate. Contraction and relaxation are controlled by electrical messages that travel through heart muscle like electricity through wires. If the electrical current does not spread through the heart muscle properly, abnormal heart rhythms develop. These rhythms, called arrhythmias, reduce the performance of the heart. Sometimes arrhythmias cause syncope.

# *Causes of Syncope*

Types of syncope, named according to the cause, include the following:

1. **Cardiogenic syncope** is usually related to abnormal heart rhythms. Probably one-fourth of all episodes of syncope are cardiogenic. Fainting that is triggered by underlying heart problems is usually more serious than fainting triggered by other causes.
2. **Neurocardiogenic syncope**, also called the common faint or vasovagal syncope, occurs in 25 to 40 percent of the people who have syncope. These episodes are related to problems with both the heart and the nervous system.
3. **Neurologic syncope** is related to problems with the nervous system, such as seizures.
4. **Metabolic syncope** is caused by disturbances of the chemical functions within the body, such as low blood sugar (hypoglycemia) or hyperventilation with or without perceived anxiety (which causes an imbalance of gases in your bloodstream).
5. **Psychogenic syncope** can be triggered by states of mind, such as anxiety, hysteria, panic or major depression.
6. **Orthostatic hypotension** is characterized by your blood pressure dropping when you stand.
7. **Syncope of undetermined etiology** is a category for syncope of unknown causes.

# Diagnosis of Syncope

## History and physical examination

The most important steps in determining the cause of syncope are when you and your physician talk about your health and your syncope (called a clinical history) and when your physician performs a physical examination. During physical examinations, physicians look, listen and feel for signs of abnormalities in your body that may cause syncope. For example, listening to your heart with a stethoscope gives your physician basic information about the rate and rhythm of your heartbeat. The clinical history provides clues to the cause of syncope such as the following examples.

### *Cardiogenic syncope*

- Episodes of cardiogenic syncope tend to occur quickly, sometimes preceded by other symptoms that suggest heart problems such as chest tightness, shortness of breath, sweating, apprehension or palpitations (the sensation of your heart pounding or beating rapidly). Sometimes syncope occurs when palpitations suddenly stop.
- Syncope occurring during exercise may indicate a cause related to the heart.
- Telling your physician about all of your medications is important because some may lower your blood pressure or slow your heart rate enough to cause syncope.
- Older people with heart disease are more likely to have cardiogenic syncope than are younger people without heart disease.

### *Neurocardiogenic syncope*

- The common faint often occurs as a response to an emotionally disturbing event, but it may also occur without warning. Describing information about the environments or other circumstances when you have fainted helps your physician understand your syncope. Neurocardiogenic syncope can be triggered by the sight of blood, by loss of blood or by suddenly stressful or painful experiences. Some adults fainted as children.
- Before they faint, some people experience warning signs such as paleness, weakness, light-headedness, yawning, nausea, sweating, hyperventilation, blurred vision and difficulty hearing. If they recognize these signs, they may be able to avoid fainting by sitting or lying down promptly.
- After a common faint, people may feel weak, but usually they are not confused.

### *Neurologic syncope*

- Often before a seizure, people have an aura (the sensation of unusual sights or smells).
- During a seizure, people lose consciousness suddenly. They may be sitting, standing or lying down when it occurs. They may lose urinary or bowel control and bite their tongues.
- After a seizure, people may be confused and drowsy.
- Unlike seizures, strokes usually cause symptoms such as muscle weakness (including paralysis, or being unable to move a part of the body), slurred speech, altered consciousness, or vision or other sensory disturbances.

### *Orthostatic hypotension*

- If you faint when you stand after you have been sitting or lying down, your syncope may be caused by orthostatic hypotension.
- To learn why your blood pressure drops, your physician needs to know if you are taking any medications that could lower your blood pressure. Blood pressure may also drop after eating, and during coughing, swallowing, urinating or having a bowel movement.

## **Diagnostic testing**

Besides the clinical history and physical examination, additional cardiac, neurologic, metabolic or psychiatric evaluations may be necessary to evaluate syncope. Examples of specific procedures that may be performed are electrocardiography and 24-hour Holter monitoring, event recording, electrophysiology testing and tilt-table testing.

### *Electrocardiography and Holter monitoring*

An electrocardiogram (ECG or EKG) is a recording of the electrical activity of your heart that is usually made during a short period of several beats (figure 1). A Holter monitor is a device you wear that produces a continuous, 24-hour recording of your heart rhythm (figure 2). However, the chance that you would faint during one of these brief measurement periods may be small.

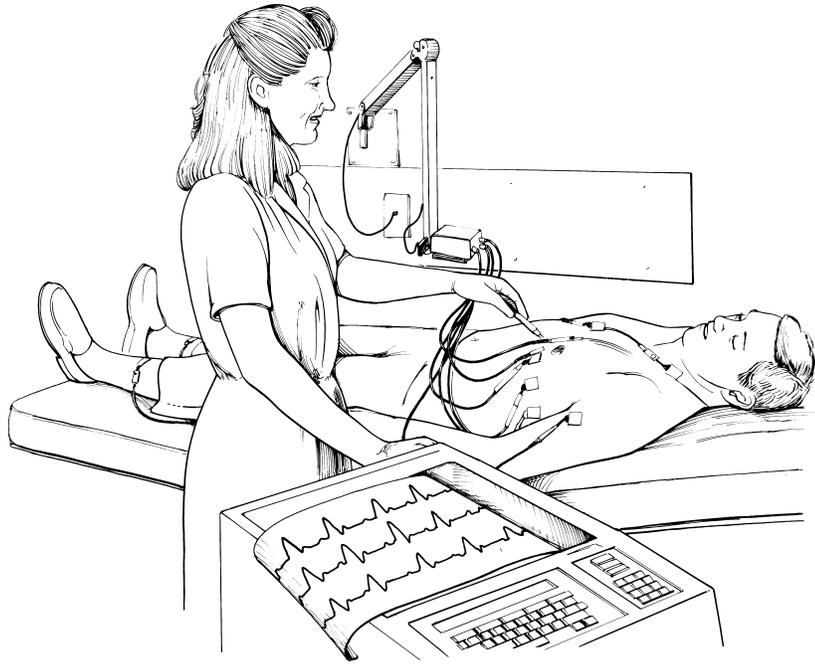


Figure 1. During electrocardiography, adhesive skin electrodes are attached to your chest and limbs to record the electrical activity of your heart while you rest. Usually the recording takes no more than a minute.



Figure 2. A Holter monitor records each of your heartbeats as you perform your everyday activities. Small electrodes stick to your skin and connect to a portable recording device that you wear (in this drawing the recorder is hanging by a strap at the man's left side).

### *Event recorders*

Event recorders are used to help diagnose heart abnormalities that occur infrequently (figure 3). An event recorder is worn like a Holter monitor, but it is worn for a longer time, such as a month. When you feel a symptom occurring, you press a button on the device, and then the device records your heart's electrical activity for several minutes. In this way your physician may study your heart's electrical activity during an episode of syncope. Event recorders may be worn outside your body or inserted under the skin by a minor surgical procedure.



Figure 3. This drawing shows a man learning how to use an event recorder he will wear for the next month. During that time, he will push a button when he feels a symptom occurring. The event recorder will then save a record of his heart's electrical activity for several minutes before and after the button was pushed. His physician will analyze the information later. (The dashed lines represent wires and adhesive electrodes on the man's skin, under his shirt.)

### *Electrophysiology testing*

Some people faint because they have life-threatening heart rhythms that are too slow (bradyarrhythmias) or too fast (tachyarrhythmias). For these people, electrophysiology testing may be the most useful diagnostic test (figure 4). It is a way of determining whether electrical impulses are traveling through the heart muscle normally or abnormally. During electrophysiology testing, electrode wires are inserted through blood vessels into the chambers of the heart. The wires can be used to record electrical activity or to stimulate the heart into abnormal rhythms so it can be examined under different conditions. The three usual reasons to perform electrophysiology testing are the following:

1. To establish the diagnosis
2. To evaluate relationships among symptoms, abnormal rhythms and blood pressure changes
3. To assess responses to treatment

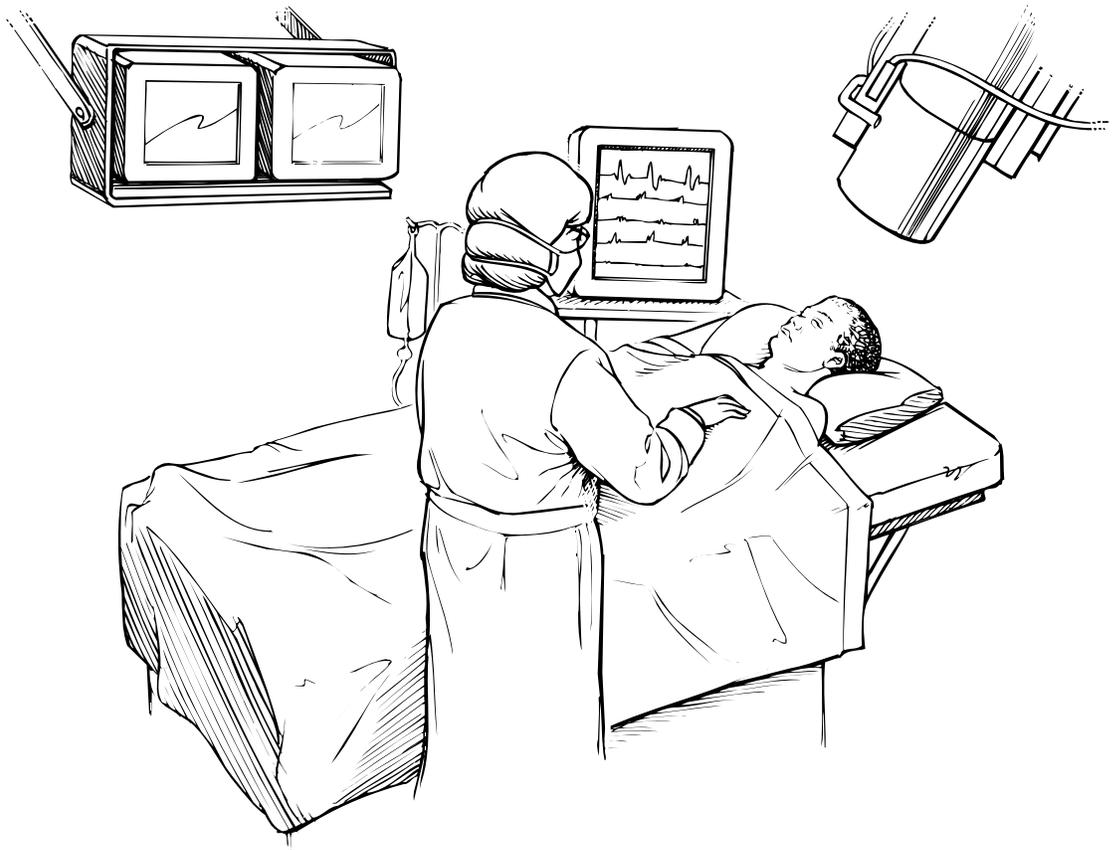


Figure 4. During electrophysiology testing, you lie on an X-ray table. A large camera sends images of your heart to nearby video screens. The room has special equipment, including heart monitors.

***Tilt-table testing***

Tilt-table testing, where you lie on an examination table that is tilted into different positions, is a useful test for people with unexplained syncope (figure 5). However, the results need to be interpreted with caution since the conditions during the test are not the same as during a usual episode of fainting.



Figure 5. The woman in this drawing has been tilted into a vertical position during tilt-table testing. The table's straps and supports hold her securely as the table tilts.

# *Treatment of Syncope*

When the exact cause of syncope is determined, the most appropriate treatment is usually obvious. However, when the cause is not completely known, decisions about treatment can be difficult. The following are examples of treatment for specific causes of syncope.

## **Treatment for bradycardia**

The preferred treatment for bradycardia (slow heart rhythm) is to implant a pacemaker. A pacemaker is an electrical device that causes the heart to beat by releasing a series of electrical impulses.

## **Treatment for tachycardia**

Treatment for tachycardia (rapid heart rhythm) depends on the nature of the tachycardia. Usually this information is obtained through electrophysiology testing. Treatment may include the following:

- Medications
- Ablation — A procedure that destroys abnormal electrical pathways in the heart
- Defibrillator — A device resembling a pacemaker that treats life-threatening tachycardias

## **Treatment for neurocardiogenic syncope**

When people have infrequent episodes of common faint preceded by warning symptoms, treatment may not be required. Often if a person is aware of the warning symptoms, loss of consciousness can be prevented by sitting or lying down, or lowering the head while sitting. Drinking extra water in hot weather is another simple step that decreases the chances of fainting.

If people have frequent episodes of neurocardiogenic syncope, they may need treatment with medications or, rarely, with a pacemaker. Several medications are available, but the dosages need to be adjusted carefully under the supervision of a physician. Side effects of many of the medications may prevent their long-term use.

# *Conclusion*

Syncope can be challenging to diagnose and treat. Successful treatment requires accurate diagnosis, so all fainting should be evaluated carefully to determine a diagnosis, appropriate treatment and follow-up care.

Additional information about syncope and heart arrhythmias can be found on the World Wide Web at <http://www.mayo.edu/heartbeat>.

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