

Patient Resources: Syncope

Overview

Syncope is the medical term for fainting or loss of consciousness. Fainting can occur for a few different reasons. The autonomic (involuntary) nervous system helps to regulate breathing, blood pressure and heart rate. Our brains control these functions without us having to think about it! If the heart slows down significantly or the blood pressure decreases, and the brain does not get enough blood flow and oxygen, fainting can occur. Syncope is very common and may affect more than a quarter of children.

Stress, pain, dehydration, fatigue, and standing for long periods of time, can all trigger the most common type of fainting called “vasovagal syncope.” Fainting which occurs during physical activity can have a more serious cause and requires a thorough assessment by a health care provider. Syncope due to an abnormality of the heart is found in fewer than 5% of all fainting episodes in children.

Syncope in patients who have known heart disease and syncope that occurs in the midst of exercise may represent serious conditions that require evaluation that day or in an emergency room.

Symptoms

Your child may experience unconsciousness (unawareness) and collapse for a brief period of time. It is possible for a brief seizure (convulsion) to occur during the period of unconsciousness (rare). Your child’s skin color may become flushed (red), pale or bluish and breathing may slow or stop. It is possible for your child’s pulse to become irregular, very slow, or completely stop. While children can feel poorly after a faint, they should be regaining consciousness within 2 minutes. Extended periods of unconsciousness suggest a mechanism other than common syncope.

Diagnosis

Your child’s doctor will ask several questions about what happened before, during, and after the syncopal episode. If you were not present when your child fainted it is important for you to gather as much information as possible from people who may have witnessed the event; this may include your child’s friends, teacher, school nurse, or babysitter. Your child’s doctor should also be told if your child injured themselves when they fainted (bump on the head, cut themselves, etc.). Your child’s doctor will want to know if any of your extended family members (parents, grandparents, aunts, uncles, cousins, etc.) has also fainted, experienced seizures, or had an unexplained sudden death.

If your doctor suspects a problem with your child’s heart he/she will probably want your child evaluated by a pediatric cardiologist (doctor specially trained to take care of children with heart



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problems). This doctor will likely order a couple of tests. These may include one or more of the following:

Electrocardiograms (ECGs)

An ECG, sometimes called an EKG, is a noninvasive test that measures the heart's electrical activity. For this test, small, sticky patches called electrodes are placed at specific locations on the skin. These electrodes measure the heart's electrical activity and are connected by wires to an ECG machine. The ECG machine then generates a tracing to record the electrical activity measured by the electrodes.

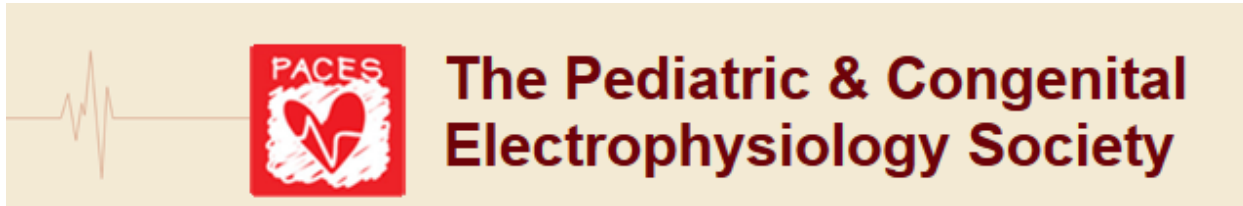
Resting ECGs are done in clinics and hospitals and require a child to remove his or her shirt so that electrodes may be placed on their chest, arms, and legs. The ECG machine records the electrical activity for approximately one minute and produces a one-page tracing, usually showing only a few beats from each electrode to represent the overall activity measured during the test. Typically, a child lies down during a resting ECG.

Echocardiogram (or echo): an ultrasound of your child's heart to assess how well the heart is beating and to look for abnormalities of the heart.

Exercise ECGs, also called Exercise Stress Tests, are performed in exercise laboratories and require electrodes to be placed on the skin just like resting ECGs. However, instead of lying down, your child engages in physical activity, like walking on a treadmill or pedaling a stationary bike, with the ECG recording the entire time. This test is used to look for changes in the ECG that may occur as the result of stress on the heart. Your child may be asked to exercise until they are too tired to keep going or the test may be stopped if certain changes are seen on the ECG. Your child's ECG will also usually be monitored after the test while they are recovering from exercise.

Holter monitors are ECGs recorded over a period of 24 hours or more. Electrodes are placed on the child's chest and connected to small ECG recorder the child wears on his or her belt or carries in their backpack. They then go home and can engage in their regular activities (other than bathing, swimming, or activities that cause excessive sweating or may cause the leads to become loose or to fall off). With a continuous Holter, the device is worn for a specific duration, typically 24 or 48 hours, and then returned to clinic so the information can be analyzed. The Holter records every beat that a child has while wearing it, providing a lot of information for your healthcare team to review. It can be used in children who have suspected arrhythmias or in children who cannot feel or communicate their symptoms.

Event monitors are a special type of Holter monitor worn for up to 60 days. They are programmed to automatically record arrhythmias that they detect on their own, but the recorder also has a button you or your child can press to record the rhythm when they have symptoms. As they are collected, these recordings are typically transmitted to a monitoring



service on a regular schedule, which then reports them to your healthcare provider. Event monitors record every beat while they are worn, but only save “events” that are automatically triggered or patient activated. The limitation of event recorders is that the child must be able to feel his or her symptoms and be able to press the activator button or communicate their symptoms to an adult to activate the recorder.

Implantable loop recorders are small event monitors implanted under the skin that are battery-powered and can stay in place for years. They may be placed with local anesthesia, conscious sedation, or general anesthesia depending on the age of the child. Like other event monitors, implantable loop recorders can be programmed to automatically detect arrhythmias and have a patient-activated recorder for symptomatic episodes. Implantable recorders communicate wirelessly with the recording-activating button (which needs to be with your child at all times) and with the special home monitoring system that transmits information about your child’s rhythm back to your healthcare team. These transmissions can be scheduled automatically or can be initiated by families when a symptomatic event has been recorded. The information on the device can also be read in your electrophysiologist’s office. Implantable loop recorders can be helpful for patients who have very infrequent symptoms that may indicate an arrhythmia.

Tilt Table Test

A tilt table test is used to evaluate patients with frequent episodes of syncope (fainting). During this test, your child lies down on a table and is secured in place. The table then rotates your child from lying to standing while his or her ECG and blood pressure is monitored for changes. The speed with which the table rotates and the time spent standing or lying down can vary depending on the testing protocol used by your healthcare team. Sometimes, medication or fluids may be administered through an IV to prevent or to treat syncope during the test. The popularity of this test has declined over the past years. Your doctor can talk to you about what role it would have. It is not required to make a diagnosis of common or vasovagal syncope.

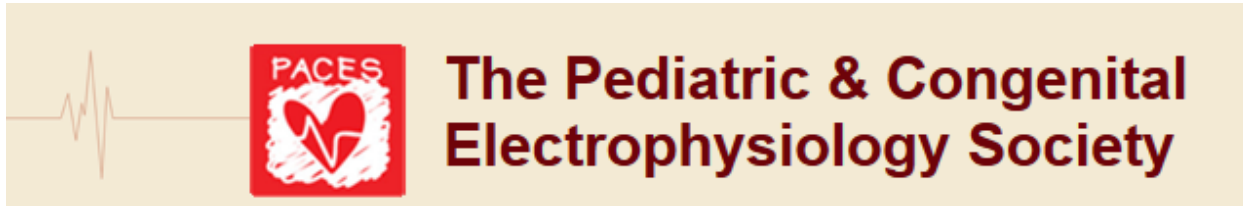
Treatment

The treatment for syncope depends on the type and cause of it.

Vasovagal syncope:

Recognize the symptoms and warning signs ahead of time.

- Most people will have symptoms of dizziness, warmth, nausea, weakness, and/or vision changes ahead of time. If your child starts having these symptoms, this is a warning sign and he/she will need to get his/her head at the level of his/her heart to prevent fainting.
- The best thing to do is to lay flat.
- If your child is sitting and can’t lie down, he/she should bend over and put his/her head between his/her knees.



- If your child is standing and can't sit or lay down, he/she should bend his/her knees and flex his/her calf muscles or squat to increase blood flow to the upper body.

Prevention:

- Your child should drink a lot of fluid to stay well hydrated. This is especially important during exercise or if the weather is warm. Drinking plenty of fluids will help to maintain his/her blood volume. Water or sports drinks, such as Gatorade are best. Soda is not recommended and can actually dehydrate your child more.
- The color of your child's urine gives information about hydration status. It should be clear, not yellow or dark.
- Your child's physician may ask you to increase salt in your child's food.
- Your child should change positions slowly and get up slowly from a sitting to standing position.
- Standing in one position for a long period of time should be avoided (e.g. standing in church or during choir practice). Bending the knees periodically while standing may be helpful.

Syncope from a cardiac structural or electrical problem:

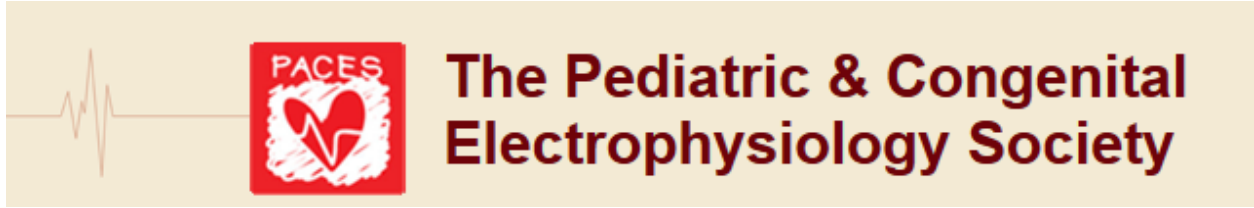
Treatment will vary greatly depending on the cause of the syncope. Your child may need an operation, a procedure, or medications. Your child's doctor will guide you through this process. This sort of syncope requires a comprehensive evaluation of your child's current cardiac status and may involve several advanced tests prior to a final plan.

What should you do if your child faints?

- He/she should stay lying down for a while so his/her body can recover. Your child should not attempt to immediately sit or stand up-he/she will just pass out again! The body needs time to recover. When your child feels ready, he/she should slowly arise to a sitting position and let his/her body adjust to this position before standing up.
- **If you your child passes out during exercise or physical activity, call your healthcare provider immediately, as this can be a sign of something else other than the common fainting spell and further work up may be needed.**
- **If your child does not regain consciousness, stops breathing, or has no pulse start CPR and call your local emergency number (911 in the United States) immediately.**

Restrictions

This will also vary greatly depending on the cause of the syncope and your child's cardiologist will tell you whether or not your child needs to be restricted. Many schools will want a note from your child's doctor indicating whether or not your child restricted from physical education



activities. Remember to ask your child's doctor for this note during the cardiology visit. States and Provinces have local laws that regulate driving restrictions following explained and unexplained episodes of syncope. Those regulations may be strict and can affect whether the adolescent or adult is viewed as licensed and insured. Your doctor can help direct you to the right resources to sort out those details. The local motor vehicle departments websites usually describe their rules.