

Special Heart Rhythm Testing

Covered in this section:

Holter Monitor, Event Monitor, Implantable Event Recorder, Transtelephonic Pacemaker/ICD Transmission and Electrophysiology Study

Children with heart defects and with structurally normal hearts can have problems with their heart's rhythm. If there is a possibility that your child is having rhythm issues, there are some special tests that the doctor may perform. The most common are Holter monitors, event monitors and exercise stress tests. If a child has an implanted pacemaker or cardioverter/defibrillator (ICD), data is often relayed to the doctor by transtelephonic pacemaker/ICD transmission. In some cases, an electrophysiology study may need to be performed in the catheterization lab.

Holter Monitor

A Holter monitor is a way to record every beat of your child's heart for 24 hours. It's usually performed to make sure that your child isn't having any dangerous heart rhythms that might need more treatment.

A small recorder is worn and attached to your child's body by stickers similar to those used to make an electrocardiogram (ECG). A Holter recording doesn't hurt, but sometimes the stickers can irritate the skin during the recording time. You and your child will be asked to keep a diary of events during the 24-hour period. It's helpful to know when your child is active, is sleeping, or is having any symptoms that might be caused by a heart rhythm problem.

Once the recording has been completed, the recorder and stickers are disconnected, and the recorder is taken back to the heart center for review. A technician will process the information from the recorder for your pediatric cardiologist to review. Your doctor will get back to you as soon as the results are read and analyzed. This may take a week or two.

Since a Holter recording is usually only worn for 24 hours, it's particularly helpful when your child is having symptoms that are happening at least once a day. If symptoms are happening less often, an event monitor may be recommended instead.

Event Monitor

Event monitoring is a way to record the heart rhythm when your child has symptoms less often than once a day. The event monitor is a recorder that's even smaller than a Holter recorder. It's worn for most of each day — typically for 30 days at a time. The monitor is always recording, but not saving. When your child has a symptom, you or your child will be told to push a button on the recorder. When pushed, the recorder will save the rhythm just at that time and sometimes for a brief time *before* the button was pushed. When a recording has been made, you'll be told how to send it through your telephone to your doctor's office.

Event monitors are small devices that are used by patients over a longer period (weeks to months, typically one month). Two sticky patches (electrodes) on the chest connect two wires to the event recorder. The monitor is always on but will only store the patient's rhythm when the patient or caregiver pushes the button. Most monitors will save the rhythm for several seconds of rhythm before the button is even pushed. The rhythm is also saved for a period after the button is pushed. A few specialized monitors are used only after the patient has symptoms. The intent is for most event monitors to be worn as much as possible every day to increase the chances of recording the patient's rhythm when he/she has symptoms.

Once a recording (sometimes more than one) has been made, it can be transmitted over the phone back to your child's heart center.

Implantable Event Recorder

An implantable event recorder (also known as an implantable loop recorder or ILR) is a device that can record your child's heart rhythm for up to 14 months. This device is placed under the skin through a minor operation. This is the best way to record very serious rhythm problems that may be happening only rarely. The recorder can be programmed to record certain heart rhythms automatically or when you or your child places a special activator over the device itself. The heart rhythms that are recorded can be displayed and printed later by a special instrument used by your pediatric cardiologist.

Transtelephonic Pacemaker/ICD Transmission

Patients who have pacemakers and implantable cardioverter/defibrillators (ICDs) are often required to send in a telephone transmission routinely to check pacemaker/ICD function. This consists of a rhythm strip and sometimes a recording with a magnet over the device. A new technology used by ICD and pacemaker patients allows all of the information from the device (including settings and recordings of arrhythmias) to be sent to your doctor not only by fax, but by Internet.

Which type of monitor is best for my child?

The type of monitor is selected by your cardiologist based on your child's symptoms. For example, if a child has symptoms several times each day, a Holter monitor would most likely record your child's rhythm during their symptoms. On the other hand, if the symptoms only occur every few weeks, an event recorder would be more appropriate. The ILR is used only when symptoms do not occur often enough for an event recorder to catch the rhythm.

Do they hurt or are they harmful?

The Holter monitor, event monitor and transtelephonic monitors do not hurt. They do not cause any harm because they're recording devices. They do not send out electricity.

The ILR requires a small surgical incision that causes minimal discomfort for a few days. After that, there is no pain.

Is there anything else to know about these devices?

The Holter, event and transtelephonic monitors cannot get wet or they will become damaged. The ILR is protected by the skin so bathing and swimming with an ILR is fine after the wound has healed. The ILR will need to be removed when it is no longer needed. This is usually when the reason for the infrequent symptoms has been determined.

Electrophysiology Study

An electrophysiology study (EP study) is a specialized cardiac catheterization that looks at the heart's electrical or rhythm function instead of its blood flow. The heart's rhythm function is what controls the start of each heartbeat and controls the heart rate.

EP studies in patients are done mostly to fix an abnormal fast rhythm problem (using ablation). They can also be done to assess the potential for developing abnormal rhythms (arrhythmias) that may need treatment with medication or surgery.