

Electrophysiology Studies (EPS)

Electrophysiology studies (EPS) are tests that help doctors understand the nature of abnormal heart rhythms ([arrhythmias](#)).

Quick facts

- Electrophysiology studies test the electrical activity of your heart to find where an arrhythmia (abnormal heartbeat) is coming from.
- These results can help you and your doctor decide whether you need medicine, a [pacemaker](#), an [implantable cardioverter defibrillator \(ICD\)](#), [cardiac ablation](#) or surgery.
- These studies take place in a special room called an electrophysiology (EP) lab or catheterization (cath) lab while you are mildly sedated.

Why do people have electrophysiology studies?

When someone's heart doesn't beat normally, doctors use EPS to find out why. Electrical signals usually travel through the heart in a regular pattern. [Heart attacks](#), aging and [high blood pressure](#) may cause scarring of the heart. This may cause the heart to beat in an irregular (uneven) pattern. Extra abnormal electrical pathways found in certain congenital heart defects can also cause [arrhythmias](#).

During EPS, doctors insert a thin tube called a catheter into a blood vessel that leads to your heart. A specialized electrode catheter designed for EP studies lets them send electrical signals to your heart and record its electrical activity.

Doctors use EPS to see:

- Where an arrhythmia is coming from.
- How well certain [medicines](#) work to treat your arrhythmia.
- If they should treat a problem by destroying the place inside your heart that is causing the abnormal electrical signal. This procedure is called [catheter ablation](#).
- If a pacemaker or [implantable cardioverter defibrillator \(ICD\)](#) might help you.
- If you are at risk for heart problems such as [fainting](#) or sudden cardiac death due to [cardiac arrest](#) (when your heart stops beating).

During an EPS, about 3 to 5 electrically sensitive catheters are placed inside the heart to record electrical activity.

What are the risks of EPS?

Risks may include:

- Arrhythmia. During EPS you may have abnormal heart rhythms that make you dizzy. If this happens, your doctor may give your heart an electric shock to bring back a regular heartbeat.
- Blood clots sometimes can form at the tip of the catheter, break off and block a blood vessel. Your doctor may give you medicine to prevent blood clots.
- Infection, bleeding and bruising at the site where the catheter went in (groin, arm or neck). Your doctor or nurse will help you avoid these problems.

How do I prepare for EPS?

- Don't eat or drink anything for 6 to 8 hours before the test.

- Tell your doctor about any medicines you take, including over-the-counter medicines, herbs and vitamins. He or she may ask you not to take them before EPS. Don't stop taking your medicine until your doctor tells you to.
- Have someone drive you to your appointment and take you home.
- If you usually wear a hearing aid, wear it during your procedure. If you wear glasses, bring them to your appointment.

What happens during EPS?

At a hospital or clinic, doctors and nurses do EPS in a room that has special equipment for the tests. You may hear this room called the electrophysiology laboratory, or EP lab. Some call it the catheterization laboratory (cath lab). During the test:

- A nurse will put an IV (intravenous line) in your arm. You'll get medicine (a sedative) that will help you relax. But you'll be awake and able to follow instructions during the test.
- Your nurse will clean and shave the part of your body where the doctor will be working. This is usually in the groin but may be the arm or neck.
- You'll be given a shot – a local anesthetic will be given – to make the area numb. Your doctor will make a needle puncture through your skin and into your blood vessel. A small straw-sized tube called a sheath will be inserted into your artery or vein. The doctor will gently guide several specialized EP catheters into your blood vessel through the sheath and advance them to your heart. A video screen will show the position of the catheters. You may feel some pressure in the area where the sheath was inserted, but you shouldn't feel any pain.
- Your doctor will send small electric pulses through the catheters to make your heart beat at different speeds. You may feel your heart beat stronger or faster.
- Electrical signals produced by your heart will be picked up by the special catheters and recorded. This is called cardiac mapping and allows the doctor to locate where arrhythmias are coming from,
- Your doctor will remove the catheters and the IV line. Your nurse will put pressure on the puncture site to stop any bleeding.
- EPS usually last 1 to 4 hours.

If the type and location of the arrhythmia is identified and an appropriate therapy decided, cardiac ablation or insertion of a pacemaker or ICD may be performed during or immediately after the EPS.

"I could feel my heart speeding up, which was weird. But it didn't hurt. It was more like hiking up and down hills really fast." Esmeralda, age 38

What happens after EPS?

You'll be moved to a recovery room where you should rest quietly for 1 to 3 hours. During this time:

- Stay still as long as your nurse tells you to. Be sure to keep the arm or leg used for the test straight.
- Your nurse will check on you often to see if there is bleeding or swelling at the puncture site.
- After the sedative wears off, your doctor will talk to you about your test results.
- Before you leave, you'll be told what to do at home.

What happens after I get home?

Follow the instructions your nurse or doctor gave you, including taking any new medicines that were prescribed. Most people can start eating food and taking their medicines within 4 to 6

hours after the test. Most can do their usual daily activities the day after the test. Don't drive for at least 24 hours.

The puncture site may be sore for several days. A small bruise at the puncture site is normal. If the site starts to bleed, lie flat and press firmly on top of it. Have someone call the doctor or EP lab.

What should I watch for?

Call 112 if you notice:

- A sudden increase in swelling around the puncture site.
- Bleeding doesn't slow down when you press hard on the site.

Call your doctor right away if you notice:

- Your arm or leg that was used for the sheath feels numb or tingles.
- Your hand or foot feels very cold or changes color.
- The puncture site looks more and more bruised.
- The puncture site begins to swell or fluids begin to come from it.

How do I learn the results of my EPS?

Most of the time, doctors will ask you to make an appointment to discuss the results of your test. You'll discuss your treatment at that appointment.

How can I learn more about EPS?

Talk with your doctor. Here are some good questions to ask:

- Are there medicines that I can use to control my abnormal heartbeats?
- Will I need a pacemaker or implantable cardioverter defibrillator (ICD) now or in the future?
- What caused my irregular heartbeat?
- Am I at risk of serious heart rhythm problems in the future?