

ELECTROPHYSIOLOGY STUDY AND ABLATION

AT CHILDREN'S HOSPITAL OF PITTSBURGH OF UPMC, we believe parents and guardians can contribute to the success of this procedure and we invite you to participate. Please read the following information to learn about the procedure and how you can help.

Fast Facts About the Electrophysiology Study and Ablation

- An electrophysiology study (often called an "EP study") is a test done by a pediatric electrophysiologist, who is a doctor with special training in the electrical conduction system of the heart in children.
- The EP study is done during a heart catheterization or "heart cath," in a special room called a catheterization laboratory or "cath lab."
- A "heart cath" is a minimally invasive procedure that lets the doctor look inside the heart through just a few pokes in the skin.
- A patient is referred for an EP study if he or she has been diagnosed with a specific type of irregular heartbeat.
- Your child will have general anesthesia or sedation for the EP study. General anesthesia will make him or her sleep throughout the entire procedure; sedation will make him or her very drowsy.
- When anesthesia is needed, there are special rules for eating and drinking that must be followed in the hours before the heart cath.
- An EP study can take from 4 to 6 hours to complete, and your child will need to stay overnight. You and your child should come to the hospital prepared to stay overnight.

What Is An Electrophysiology (EP) Study?

An electrophysiology (*ee-LECK-tro-fizz-ee-ALL-o-gee*) or EP study is a special type of heart cath that checks the electrical conduction system of the heart. The EP study is done by a pediatric electrophysiologist, who is a pediatric heart doctor with special training in the electrical conduction system of the heart. A patient is referred for an EP study when he or she has been diagnosed with a specific type of arrhythmia (*a-RITH-me-uh*) or irregular heartbeat.

In the EP study, the doctor uses special catheters to look at the electrical system of the heart and help find areas of abnormal electrical activity. Catheters that measure the heart's electrical signals are positioned in the areas where the electricity of the heart is generated. Once there, the doctor can stimulate the heart to beat rapidly or irregularly. The heart's response to the stimulation — and the way the electricity moves around the heart when it's in an irregular rhythm — helps the doctor diagnose the nature of the arrhythmia.



What Is An Ablation?

If the electrophysiologist is able to find the source of the arrhythmia during the EP study, he or she may perform an ablation (*uh-BLAY-shun*). The source may be an extra pathway causing the heartbeat to go off track, or an area of abnormal heart tissue. When this area is found, catheters with special tips are placed over that spot, and tips are either heated or cooled. The process of heating the tips is called radiofrequency or RF ablation; the cooling of the tips is called cryoablation (*CRY-o-uh-BLAY-shun*). Both RF ablation and cryoablation have the same effect, which is to cause the tissue in that very tiny spot to die. That stops the area from conducting the extra impulses causing the rapid heartbeats.

What Are the Benefits and Risks of Ablation?

The benefits of ablation are the improvement or complete cure of certain arrhythmias. But, like any medical procedure, there are some risks involved. Among the risks are:

- Brachial plexus injury
- Perforation of the heart or vessels
- Cardioversion
- AV node injury requiring pacemaker implantation
- Myocardial infarction
- Need for surgery

Your child's doctor will explain each of these risks in detail before your child's EP study and ablation so that you will be able to make an informed decision about your child's condition.

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At the Heart Institute, the doctors and nurses work as a team with many other medical professionals. Among the team members is a pediatric anesthesiologist, who will give your child the medications to make him or her sleep and monitor his or her vital signs during the cath. The cath lab staff also will be involved by preparing your child for the cath and getting equipment needed by the doctor. Your child's pediatric electrophysiologist will do the heart cath, and may work with a cardiology fellow, who is a pediatric doctor training to be a cardiologist.

Home Preparation

When general anesthesia is needed, there are important rules for eating and drinking that must be followed the night before and the day of the procedure. One business day before your child's procedure, you will receive a phone call from a scheduling nurse between 1 p.m. and 9 p.m. (Nurses do not make these phone calls on weekends or holidays.) Please have paper and a pen ready to write down these instructions.

- The nurse will ask you about your child's medical history, current medications, and readiness for the heart cath. If you have any questions, you may ask the nurse at this time.
- The nurse will tell you what time you should arrive at the hospital. Allow enough time for travel and parking. Arriving late may delay your child's heart cath or cause it to be postponed.
- The nurse will give you specific instructions for eating and drinking. For children older than 12 months, the instructions usually are:
 - No solid food or non-clear liquids after midnight the night before the test. That includes milk, formula, juices with pulp, and chewing gum or candy.
 - Only clear liquids up to 2 hours before the scheduled arrival time. Clear liquids include water, Pedialyte™, Kool-Aid®, and juices you can see through, such as apple juice.
 - No tooth brushing on the morning of the test.
 - Nothing to eat or drink in the 2 hours before the scheduled arrival time.
- Children younger than 12 months may have different eating and drinking instructions. No matter what age your child is, *you should follow the specific instructions given to you on the phone by the nurse.*
- For the safety of your child, it is important to follow these specific times for eating and drinking. **Remember, if your child does eat or drink after the scheduled times, it will delay the test or cause it to be rescheduled for another day.**
- Dress your child in comfortable, two-piece clothing or pajamas.
- You should not use any cream, lotion, powder, or baby oil on your child's chest on the day of the heart cath.
- If your child is sick with a mild cold or cough in the days leading up to the heart cath, in many cases he or she can still have the heart cath as scheduled. If your child has a severe cold, fever, or flu in the days before the heart cath, the procedure might need

to be rescheduled until your child feels better. Please call our office to discuss your concerns.

A Parent's/Guardian's Role

The most important role of a parent or guardian is to keep your child calm. The best way to keep your child calm is to be calm yourself. Knowing what to expect and explaining it to your child beforehand is the best way for both you and your child to be prepared for this procedure. Here are some guidelines to use when discussing the heart cath with your child.



At any age

Your child may bring along a "comfort" item — such as a favorite stuffed animal or "blankie"— to hold during the procedure.

There are televisions in the Same Day Surgery rooms, but you are welcome to bring along a portable DVD player, laptop computer, or hand-held video game if these items will help your child.

Birth to 2 years

Please bring along "comfort" items for your child, such as a favorite blanket, stuffed animal, or toy.

2 to 7 years

The day before your child's heart cath, explain the procedure using simple words. You might explain that the doctor "will take pictures of your heart while you are taking a nap."

A medical play kit can be helpful so that your child is familiar with items he or she may see. For example, you can show your child how to use a stethoscope on a teddy bear. Books about going the hospital might also be helpful.

7 to 11 years

Older children may benefit from discussing the heart cath about a week or so before the scheduled date. At this point, kids understand more about the body, the organs, and how they work. For that reason, they may be more afraid of pain. You might explain to your child that he or she will be getting medicine that will make him or her very sleepy throughout the heart cath, and that he or she will not feel any discomfort during the procedure. It will also make it hard to remember much about the procedure afterward.

You might add that the heart is like a pump, and the heart cath will help the doctor understand how well your child's heart is pumping. Books about going to the hospital also might be helpful.

12 years and up

Preteens and teens are able to understand the way the heart works, what their heart problem is, and why they need this procedure. They might ask very insightful questions. Use their questions to help guide your discussion. This age group might find the Emmi Kids web video to be helpful in understanding the heart cath. The

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cardiology staff will give you information about how to view the Emmi Kids video on the Internet at home. It is recommended that parents view it first so they know what the video covers.

The EP Study and Ablation

You and your child will register for the heart catheterization at the Same Day Surgery Center on the 4th floor of Children's Hospital. You and your child will be called to an examination room where your child's vital signs will be checked.

- Your child will be asked to take off all clothes down to his or her underpants and put on a hospital gown.
- A member of the hospital's anesthesia team will meet with you and your child to make sure he or she has not had any food or liquids before the test and to ask you any other important questions about your child's health. After speaking with the anesthesiologist, you will be asked to sign a consent form to authorize the anesthesia.
- The cardiologist performing the study will come to meet you and your child before the test begins. At that time, you may ask any questions you may have about the test.
- A nurse will come to get your child when it is time to move into the cath lab. Parents will be shown to the waiting area. Sometimes one parent is encouraged to walk into the cath lab with the child.
- Once your child is in the cath lab and asleep, an intravenous (IV) line will be placed into a vein in his or her arm. During the procedure, medicine will be given through the IV to keep your child asleep or drowsy. Fluids will be given through the IV to prevent dehydration.
- At the beginning of the test, an electrocardiogram, or ECG, will be done. Small plastic stickers will be placed on your child's chest and wires will be attached to the stickers and connected to the ECG machine.
- A blood pressure cuff will be wrapped around your child's arm to measure blood pressure frequently throughout the test.
- A light sensor will be taped to your child's finger to measure the amount of oxygen in his or her blood.
- When your child is ready, the cardiologist will begin the EP study.
- An injection of local anesthetic will be given under the skin where each catheter is going to be inserted.
- The cath lab staff will update you periodically throughout the procedure. The doctor will speak with you after the EP study and/or ablation, so you'll know the results right away. You will then be able to see your child in the recovery room.

After the EP Study and Ablation

You and your child should come to the hospital prepared for an overnight stay. As soon as the procedure is done, your child will be moved to a recovery room until the effects of anesthesia begin to wear off. You will be called to the recovery room so that you can be there as he or she wakes up. You can help by talking softly and touching your child so he or she knows you are there.

- Your child will have pressure bandages taped in place on the sites where the catheters were inserted. This tape needs to stay in place until the next morning to minimize bleeding. Even with pressure bandages, your child may have bruising in the areas of the insertion sites.
- The blood vessels in the leg are used, and your child will be told to keep the leg straight for 6 hours after the procedure to minimize bleeding.
- Your child will need to lie flat on his or her back for 6 hours after the heart cath, and then will be allowed to walk or sit in a comfortable position.
- Your child will stay in the recovery room to be watched until he or she is alert and his or her vital signs are stable. The length of time your child will spend in the recovery room will vary because some children take longer than others to wake up after anesthesia.
- When your child is fully awake, he or she will be moved to an inpatient room for an overnight stay.
- He or she may still be groggy for the rest of the day.
- Once your child has been discharged from the hospital, he or she usually can return to school within a few days, but may have some activity restrictions. Talk to your child's doctor about returning to school and activities, and allow your child to resume activities at the pace he or she is comfortable with.
- Your child may begin to eat and drink a little at a time and resume normal eating and drinking as long as he or she is feeling well.
- Your child may have bruising in the areas where the catheters were inserted. Tylenol® or Motrin® may be given if the bruises are uncomfortable.
- You should follow up with the cardiologist in 1 month after the procedure. Please contact our office if you have any further questions.

Special Needs

If your child has any special needs or health issues you feel the doctor needs to know about, please call the Heart Institute before the procedure and ask to speak with a nurse. It is important to notify us in advance about any special needs your child might have.

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412-692-5540 General Line
412-692-5759 Cardiology Nurse Line
412-692-6045 Nurse Practitioner
412-692-5325 Cardiologist on call (evenings, weekends, holidays)

To see the list of all available patient procedures descriptions, please visit www.chp.edu/procedures.