

INTERVENTIONAL HEART CATHETERIZATION

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 Interventional Heart Catheterization

- An interventional heart catheterization is the treatment or repair of a heart condition during a heart catheterization, through the use of special devices.
- A cardiac catheterization or "heart cath" is a minimally invasive procedure which allows the doctor to look inside the heart through just a few pokes in the skin.
- Your child's doctor will explain the specific interventional procedure your child may need before the heart cath.
- The interventional heart cath is done in a special room called a catheterization laboratory or "cath lab."
- Your child will have general anesthesia or sedation for the interventional heart cath, depending on what your child's doctor decides. General anesthesia will make him or her sleep throughout the entire procedure; sedation will make him or her very drowsy.
- When anesthesia or sedation is needed, there are special rules for eating and drinking that must be followed in the hours before the heart cath.
- An interventional heart cath can take from 2 to 5 hours to complete, depending on what is being done, and your child probably will need to stay overnight afterward. You and your child should come to the hospital prepared to stay overnight.

What Is A Heart Cath?

A cardiac or heart catheterization or "heart cath" is a minimally invasive procedure which uses thin, flexible tubes called "catheters" to look at and get information about the heart from the inside. To get inside the heart, the catheters are inserted into the big blood vessels in the groin, called the femoral (*FEM-or-ul*) artery and vein, in the same way an intravenous (IV) line is placed. Sometimes other blood vessels in the neck or arm also are used. The catheters are gently pushed through the blood vessels and into the heart using a type of x-ray called fluoroscopy (*floor-OS-co-pee*) to guide the placement of the catheters. Once the catheters are in position inside the heart, they can be used to gather different types of information depending on what the doctor needs to know.



There are many different types of catheters that can be used during a cardiac cath, and each catheter serves a different purpose. Some catheters allow the medical team to take blood samples from different parts of the heart and from the lungs to look at oxygen saturation (how much oxygen is in the blood), or they can help measure the blood pressure in the heart and lungs. Others allow the doctor to look at the electrical system of the heart. By inserting a special dye called "contrast" through the catheters and looking at it under fluoroscopy, the doctor can see the heart, and the arteries and veins in the heart and lungs. The doctor can see how well the heart is pumping and take pictures of it so that they can be looked at later.

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 procedure. The cath lab staff also will be involved by preparing your child for the procedure and getting equipment needed by the doctor. A pediatric cardiologist who specializes in catheterization will do the procedure, and may be assisted by a cardiology fellow, who is a pediatric doctor training to be a heart specialist.

What Is An Interventional Heart Cath?

An intervention is the term used when the doctor uses devices to fix or improve a heart condition during a heart catheterization. Today, many heart conditions can be treated during an interventional heart cath that in the past would have needed a separate surgery.

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An interventional heart cath will be done by a pediatric interventional cardiologist, who is a heart specialist trained to do heart cath and corrective procedures in children, and, in some instances, adults as well.

During an interventional heart cath, the doctor can use a number of special catheters, balloons, and devices to open or close holes in the heart, widen narrowed vessels, close or plug abnormal or extra vessels, and improve or repair other heart conditions. Interventions such as these can save the lives of critically ill children, delay or avoid the need for surgery, or help prevent illness or heart failure.

A device is a special piece of medical equipment that is put into the heart or lungs through the catheters that are placed at the beginning of the heart cath. Devices are used for many reasons and each one has its own way of helping the heart. These devices are secured inside the heart and usually will not be replaced or taken out.

Your child's doctor will explain to you what devices he or she plans to use before the interventional heart cath, which will depend on what he or she finds during the procedure. After the interventional heart cath, the doctor will tell you which specific devices were used for your child.

There are risks and benefits to all medical procedures performed. The benefits of doing a heart cath will be discussed with you prior to the procedure, many times in a special "pre-catheterization clinic visit" at the Heart Institute. This visit can take place in the days or weeks before the cath day. Risks to this procedure are very low, and will be discussed in detail prior to the cath. They include infection, arrhythmia, heparin use, clot formation, stroke, blood loss, blood transfusion, cardiac arrest, death, pulse loss, vessel damage, allergic reaction, bruise, or hematoma formation at catheter sites. There may be additional risks pertaining to the specific intervention being performed. These risks also will be discussed in detail prior to the procedure, and your questions answered, so that you can make an informed decision about your child's care.

Home Preparation

When sedation or 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.



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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 also might 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 medication that will make him or her very sleepy throughout the heart cath, and that this medication will keep him or her from feeling any discomfort during the procedure. It also will 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 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 Interventional Heart Cath

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.
- To begin, an electrocardiogram, or ECG, will be done. Small plastic stickers will be placed on your child's chest; wires will be attached to the stickers and then connected to a machine.
- A blood pressure cuff will be wrapped around your child's arm to measure blood pressure frequently throughout the procedure.
- 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 heart cath.
- An injection of local anesthetic will be given under the skin where the catheter is going to be inserted.

After the Interventional Heart Cath

You and your child should come to the hospital prepared for an overnight stay. As soon as the heart cath is done, your child will be moved to a recovery room until the effects of anesthesia begin to wear off. The doctor performing the procedure will come and speak to you once it is complete to review the results of the cath. You will be called to the recovery room so that you can be there as your child 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.
 - If blood vessels in the leg were used, 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 on his or her back, with legs straight, for 6 hours after the heart cath.
- 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 either be moved to an inpatient room for an overnight stay, or to another recovery room until the discharge time.
- He or she may still be groggy for the rest of the day.



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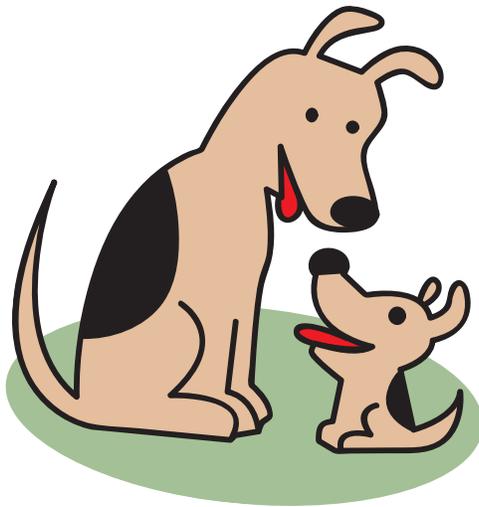
- Your child may begin to eat and drink a little at a time and resume normal eating and drinking as long as he or she is feeling well.
- Your child may have bruising in the areas where the catheters were inserted. Tylenol® or Motrin® may be given if the bruises are uncomfortable.
- Once your child has been discharged from the hospital, he or she usually can return to school within 1 to 2 days.
- If a device was placed, your child may have some physical activity restriction for up to 4 weeks. 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 should avoid tub baths, hot tubs, and swimming for 3 to 4 days after the procedure to help prevent infection of the catheter sites in the leg.
- You should follow up with your child's cardiologist in 1 month, and be sure to call the 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.

Heart Institute
Division of Pediatric Cardiology
Children's Hospital of Pittsburgh of UPMC
One Children's Hospital Drive
4401 Penn Ave.
Pittsburgh, PA 15224

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.