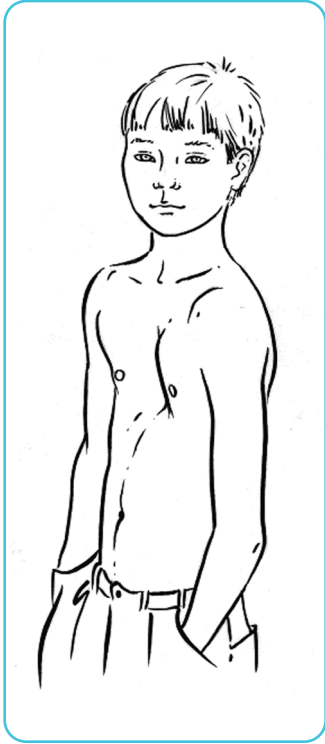


# Pectus Excavatum



## What is pectus excavatum?

Pectus excavatum (peck-tuss ex-kuh-vaw-tum) is a breastbone (sternum) and rib cartilage deformity that results in a dent in the chest. It is also called “sunken” or “funnel” chest. Most of the time, this indentation is in the lower half of the sternum, and can be mild or severe. The sternum may press on the heart and lungs. Some defects cause no symptoms but can affect your child’s body image.

## What causes pectus excavatum?

The cause is unknown. The cartilage that attaches the ribs to the sternum seems to grow abnormally and pushes the sternum in. This causes the sunken look. Pectus excavatum can “run” in families, but often only one person in a family is affected. It may be seen during infancy or may first be noticed later in life. The dent becomes more noticeable as your child grows, especially during growth spurts.

## Why might my child need surgery?

Surgery for pectus excavatum is done for medical reasons. Children with moderate to severe defects can have shortness of breath, chest pain, and trouble breathing when exercising. These symptoms can be from the heart and lungs being pushed on and shifted inside the chest. Surgery to correct pectus excavatum is usually done when the child is a teenager.

## What kind of tests might my child need?

If the defect is moderate to severe and your child has some or all of the symptoms listed above, your surgeon will order tests to assess heart and lung function. These may include a CT scan of the chest, an exercise test that monitors lung function, and possibly an echocardiogram (ultrasound of the heart).

## What types of surgery are done for pectus excavatum?

The two kinds of operations done at Seattle Children’s Hospital to correct pectus excavatum are the Ravitch procedure and the Nuss procedure.

- In the Ravitch procedure, a long cut is made across the chest, below the breast line. The abnormal cartilage is removed. The sternum is repositioned, and at times stabilized with a steel bar. This bar is removed about six months later during a same-day surgery.
- The Nuss procedure involves 3 to 5 small incisions. One cut is in the middle of the chest near the bottom of the sternum and the other 2 to 4 are on the far sides of the patient’s chest (1 or 2 on each side). A steel bar is bent into the desired chest shape and is passed under the sternum. The bar is used to “pop” out the depression. This bar is removed in about two years during a same-day surgery.

### **What complications can occur?**

The most common complication of surgery is a pneumothorax (new-mo-thor-ax). This is when air leaks inside the chest and causes a partial collapse of the lung. This usually gets better on its own but can be painful. If it does not get better, a small tube is placed in the chest to release the air and/or fluid. This small tube may also be placed in the operating room during the surgery. Daily x-rays are taken to check the pneumothorax as well as the position of the bar.

Also, there is a small risk (less than 10 percent) of the bar moving out of position. The risk of infection is less than 1 percent.

### **How long is the hospital stay?**

Most times, your child will stay in the hospital 3 to 5 days.

### **What can we expect during recovery in the hospital?**

- Your child will be asked to take deep breaths often.
- With either kind of surgery, your child will need help with moving and positioning to help maintain correct position of the bar and chest. Activity restrictions include no side lying or rolling onto the side, no pushing or pulling with arms, and no bending or twisting at the waist.
- Your child will be encouraged to get out of bed and move into a chair within a day or two after the Nuss procedure, and 3 to 4 days after the Ravitch procedure.
- Both of these surgeries are painful, but your child's doctors and nurses will do all they can to manage your child's pain. Your child will likely have either an epidural catheter for pain control or two "soaker catheters" (one on each side of the chest) to deliver continuous numbing medicine. Pain medicine is also given by intravenous (IV) line in the first day or two, then it is given by mouth when your child is able to tolerate a regular diet.

### **What are the long-term results after repair of pectus excavatum?**

Ninety-five percent of repairs result in improved appearance. In 5 percent of cases the chest becomes sunken again after the bar is removed. For some children, symptoms of pain and shortness of breath lessen and exercise becomes easier after the surgery recovery period. However, if these symptoms were not related to the pectus excavatum there will be no improvement.

### **Care at home after surgery**

#### **Will my child be in pain?**

Following a surgery, some pain and discomfort is normal. No matter the level of your child's pain, we join you in believing they are hurting and responding right away. You know your child best. We encourage you to take an active part in your child's recovery by talking with your care team about how your

child shows pain and what comforts them. In addition to medicine given to your child while in the hospital, encourage age-appropriate coping tools to treat pain and provide support.

Children who undergo either version of the surgery will have pain because of the work done on the bone and cartilage. If your child has the Nuss procedure, it is common for them to have pain for a longer time than the Ravitch procedure, frequently up to several weeks after surgery. Because of this long healing time, pain control is very important.

When your child leaves the hospital you will receive prescriptions for pain medicine. These will include an anti-inflammatory drug and an opiate. The anti-inflammatory (such as ibuprofen) drug is the best medicine for bone, muscle and joint pain. The opiate is used for more severe pain (“breakthrough pain”) not helped by the anti-inflammatory medicine. **Do not hesitate to give your child pain medicine regularly during this healing time.** Staying on top of the pain will help them heal faster. As time goes on your child will need less pain medicine.

### Other Medicines

Other medicines that may be used for related symptoms are listed below. The nurse will discuss all of them with you before you leave the hospital.

- Antacid: helps to prevent stomach ulcers while on the anti-inflammatories.
- Stool softener: for constipation caused by the opiates. When your child takes the opiate they should also take the stool softener. If the stool softener does not work, try a glycerin suppository or contact the general surgery nurses for more help.
- Anti-anxiety agent: can help with muscle spasms and is usually ordered to help your child sleep at night.

### How much activity can my child do?

- Your child’s activity will be limited until the healing process is complete. They will need to take it easy for the first 4 weeks after surgery.
- Avoid heavy lifting for the first 2 months (this includes heavy backpacks). As a general rule, do not lift anything heavier than a gallon of milk.
- Start walking as soon as possible. This is an excellent exercise and should be done often to build strength. It also helps to expand the lungs, preventing pneumonia, and increases movement of the bowels, preventing constipation.
- Most children return to school two weeks after surgery.
- Other limits on activity will be made by your child’s surgeon.
- During the first month it is important not to slump or slouch while sitting, and to bend at the hip when picking up items from the floor.
- Good posture will help keep the bar in place and help your child have the best results.
- Several weeks after surgery your surgeon will start your child on a strict exercise program.

### **How do I care for the incisions?**

It is OK for your child to shower once they have returned home. Gently wash the incisions with soapy water. Do not soak the incisions in a bath or hot tub for 2 days after surgery. Getting in and out of a bath may put too much pressure on the surgical site. Sutures that dissolve on their own are used to close the incisions, so there will be no stitches that need to be removed. Steri-strips (small pieces of white tape) or dermabond (glue) will cover the incisions. These will usually fall off or peel off in 10 to 14 days.

### **What position should my child sleep in?**

Your child may not want to lie on their side right away. They may be uncomfortable when flat on their back. Have your child try to sleep in a recliner or prop pillows under their mattress so they are lying in a raised position. You may want to try using a special bed or foam wedges. Your insurance company may cover charges for these items. Eventually your child will be able to sleep on his or her side again, and if it doesn't hurt, it's OK.

### **Should my child wear a Medic Alert bracelet?**

Yes. Because your child may have a metal bar inside their chest for several months to years, we suggest your child wear a Medic Alert bracelet or Medic Alert jewelry during that time. This will alert people to some precautions. Your nurse can give you a brochure and application for the bracelet that can be purchased at almost any major drug store chain. The words on the bracelet should read: "Surgical steel bar in place under sternum." When you register with Medic Alert, also give this information: "CPR can be performed; may require more external force. If defibrillation is needed, paddle placement needs to be anterior/posterior." The wording on the Medic Alert bracelet should also help your child with passing through security areas with metal detectors. It is OK for your child to go through a metal detector with a steel bar under the sternum.

### **When should my child return for follow-up visits in the Surgery Clinic?**

The first follow-up visit should occur about 2 weeks after your child was released from the hospital. More visits will be needed during recovery to check progress and start a controlled exercise program. Call 206-987-2794 to schedule.

### **When should I call the office?**

If your child is having any of the problems listed below, call the General Surgery nurses at 206-987-0237 Monday through Friday during the day. After hours and on weekends call 206-987-2000 and ask the hospital operator to page the general surgery resident on call.

- Temperature greater than 101.5 F
- Redness, swelling, drainage or bleeding from the incisions
- Worsening chest pain, especially with deep breaths

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### To Learn More

- General Surgery Nurses Line  
206-987-0237
- Your child's healthcare provider
- [www.seattlechildrens.org](http://www.seattlechildrens.org)

- Pain not controlled with pain medications
- Problems with breathing
- Cough that does not go away
- Injury to the chest that may have caused the bar to move
- Sudden onset of chest pain or difficulty breathing
- Any questions or concerns

### For more information visit:

- [www.seattlechildrens.org/medical-conditions/bone-joint-muscle-conditions/pectus-excavatum/](http://www.seattlechildrens.org/medical-conditions/bone-joint-muscle-conditions/pectus-excavatum/)
- [www.emedicine.com/ped/topic2558.htm](http://www.emedicine.com/ped/topic2558.htm)

### Free Interpreter Services

- In the hospital, ask your child's nurse.
- From outside the hospital, call the toll-free Family Interpreting Line 1-866-583-1527. Tell the interpreter the name or extension you need.
- For Deaf and hard of hearing callers 206-987-2280 (TTY).

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Seattle Children's offers interpreter services for Deaf, hard of hearing or non-English speaking patients, family members and legal representatives free of charge. Seattle Children's will make this information available in alternate formats upon request. Call the Family Resource Center at 206-987-2201.

This handout has been reviewed by clinical staff at Seattle Children's. However, your child's needs are unique. Before you act or rely upon this information, please talk with your child's healthcare provider.

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