Center for Pectus Excavatum and Carinatum

Pectus Excavatum Information
childrensmercy.org/pectus

Pectus Excavatum:

If your child develops a sunken chest (also referred to as pectus excavatum) chances are another family member has had this congenital condition too. While pectus excavatum causes are unknown, the condition tends to run in families; 25 percent of patients discover a family history of others with “funnel chest” (also known as caved-in chest).

The condition is the most common deformity in children’s chest walls and can become visible anytime from infancy through puberty. Pectus excavatum occurs in about 1 in 1,000 children and is 4 times more common in males than females. It occurs when several ribs and the sternum (breastbone) don’t grow normally, causing the sternum to be pressed inward and resulting in a depression that is visible when looking at your child’s chest. The depression can range in size and depth, being deeper on one side, causing the sternum to be curved and, in severe cases, pushing the sternum to nearly touch the spine. Pectus excavatum can cause functional impairment as well as psychosocial problems.

There is a slight correlation between pectus excavatum and scoliosis, although one doesn’t necessarily cause another.

Symptoms of Pectus Excavatum:

Symptoms such as shortness of breath, chest pain or exercise intolerance may or may not occur. Body image issues are also common. Kids with pectus excavatum should be encouraged to live active lifestyles without any restrictions.

Patients who have pectus excavatum should continue participating in all activities they find enjoyable. Some symptoms may be exacerbated with physical activity, but the activity itself does not pose a health risk. Pay attention to activities that seem to cause problems and ask your pectus provider if there is any relation.

Treatment Options for Pectus Excavatum:

Pectus excavatum typically progresses with puberty and rapid growth. Adolescents with a severe case of pectus excavatum and associated symptoms may be a candidate for surgical repair during the teenage years with the minimally invasive repair of pectus excavatum (MIRPE).

The Vacuum Bell Therapy (VBT) offers the option of a nonsurgical treatment of pectus excavatum and uses a suction device to elevate the sternum/chest wall. Correction using the VBT likely will not achieve the cosmetic result of surgical correction. However, in a subset of pectus patients, conservative treatment with the VBT represents a potential alternative to surgery.

To determine the severity of the pectus excavatum defect, a chest CT (CAT scan) of your child's chest to measure the indented chest depression may be recommended to determine surgical candidacy.

Additional testing (such as an exercise stress test, pulmonary function tests or an echocardiogram) may be required depending on the insurance company for approval of surgery and surgery is sometimes not covered by insurance. We recommend checking with your insurance company for specifics.

Center for Pectus Excavatum and Carinatum

Pectus Excavatum Surgery:

Minimally Invasive Repair of Pectus Excavatum (MIRPE)

Doctors began using open surgery to correct the condition in the early 1900s. Eighty years later, Donald Nuss, MD, a Norfolk, VA., surgeon, devised an approach that was less invasive. Since then, the surgeons at Children's Mercy have modified the Nuss procedure to include the addition of a central incision to allow safe passage of the bar across the chest.

The surgeon inserts a steel bar that has been bent to fit under the sunken sternum and around the front of the chest. The bar helps reshape the chest as the child grows. After about three years, the bar is removed in a same-day procedure. This pectus excavatum repair is highly effective. Less than 1 percent of children will develop the condition again.

Pectus Excavatum Cryoablation Pain Management:

Cryoablation is a newer modality of pain management for patients undergoing bar placement to repair pectus excavatum repair that dramatically reduces pain after surgery. The decision to use cryoablation was based on extensively investigating patient outcomes which revealed that cryoablation was safe and effective to improve pain control and shortened the hospital stay.

In the operating room, the surgeon will freeze 4 nerves that run between the ribs on each side prior to placing the bar. This will temporarily decrease pain transmission through these nerves. The full effect may take 12-24 hours for optimal pain control. This does not eliminate the pain completely. The cryoablation will last between 2-3 months. Patients may experience some skin numbness to chest wall. The numbness should resolve within 3-6 months when the nerve grows back and regains function.

The patients will go home with short term use of oral pain medications to continue during their recovery. Most patients will be able to be discharged the day of surgery.

Post-Operative Expectations:

The incisions are closed beneath the skin with dissolving stitches. Steri-strips will be in place, and they will fall off on their own in approximately 2 weeks. The incisions will be pink and gradually fade over the next year. We recommend keeping sunscreen on the scars for improved healing.

- Some pain is expected
    - Most pectus patients experience postoperative discomfort in the form of intense pressure because of the force the bar puts on the sternum that will improve with time
    - Be very mindful with your pain medication regimen and other prescribed medications

- It is important to follow the scheduled Tylenol and Ibuprofen for the first 3 days even if not in pain

•Cryoablation

- During the operation, your nerves are temporarily frozen, which is a big part of pain control for this operation. It does not take all the pain away
- Your whole chest may feel numb, including your skin
- The cryoablation typically works for 2-3 months, then will start wearing off. (Varies by patient)
  - When it wears off, you may start to feel sensations (such as burning or prickling, “pins and needles" or sharp, shooting pain) and occasionally they can be uncomfortable, but will improve with time

Activity level after surgery:

- No strenuous physical activity for 2 weeks following surgery
- May return to normal activity as tolerated after 2 weeks including sports. Recommend slowly increasing activities and easing into heavy lifting and contact sports
- Your child can return to school when his or her energy level improves, and pain is well controlled.
  - **Do not drive if you have taken Oxycodone.**
- Although you do not have specific activity restrictions, you may find that certain activities are more uncomfortable than others, and you may want to avoid those for as long as it takes to be able to do them comfortably.
- What is that noise?
  - A popping or clicking sound or sensation is normal and can occur with movement of the bar and/or stabilizer within the chest wall. This may occur intermittently throughout the time the bar is in place.
- Additional information:
  - No MRI examinations of the chest and abdomen are allowed. CT scans are acceptable
  - If defibrillation is needed, paddle placement needs to be anterior/posterior (front and back)
  - CPR CAN BE PERFORMED but may require more exertional external force
  - Dental prophylaxis is not needed with a bar in place
  - Medic alert bracelet is recommended. Inscription should state "surgical steel bar in chest".

Follow-Up Appointments:

- Follow-up ~2-4 weeks following surgery and then as needed until it is time for bar removal.