

Pediatric Chest Pain

Chest pain in children is common. There are many causes of pediatric chest pain, and luckily, most of them are not heart-related. Studies show that only 1-4% of chest pain in children is due to a heart condition.

What are some cardiac causes of chest pain in children?

Because chest pain is a common complaint in adults with heart disease, it is natural to also worry about the heart when a child is experiencing chest pain. However, heart attacks in children are very, very uncommon. Some of the rare cardiac causes of chest pain in children include:

Coronary artery anomaly. A congenital (something you are born with) defect where one or more of the coronary arteries (the vessels that supply blood to the heart) are not in the proper place or are not connected properly, which can cause abnormalities in blood supply to the heart.

Cardiomyopathy. An abnormality of the heart muscle, where the muscle can become too thick, stiff, or weak, compromising the function of the heart.

Pericarditis. Inflammation of the sac that surrounds the heart can cause chest pain that is worse with breathing or lying down. Other symptoms may include shortness of breath or back/shoulder pain.

Myocarditis. Inflammation of the heart muscle, often caused by a virus. This can cause the heart not to function as well as it should, and is a cause of electrical disturbances in the heart.

Kawasaki disease. This disorder causes inflammation in the coronary arteries, which can later lead to narrowing of the coronary arteries, or an aneurysm (bulge) in the coronary arteries.

Congenital heart defects. Some congenital defects, such as severe valve abnormalities, can cause chest pain.

Arrhythmias. Children who are experiencing electrical abnormalities that cause the heart rate to be too fast or erratic may describe their symptoms as a chest pain or discomfort.

When should I worry about my child's chest pain?

Warning signs that may indicate that further heart testing is needed include:

- Chest pain that is exertional (happens with physical activity)
- Chest pain that is associated with other symptoms, such as shortness of breath, palpitations, or feeling faint/fainting
- Family history of cardiomyopathy or unexplained cardiac arrest/sudden death at a young age
- Family history of early heart attacks or familial hyperlipidemia (very high cholesterol)
- If evaluation with your pediatrician (or elsewhere) reveals a heart murmur, abnormal EKG, or abnormal vital signs

If my child's chest pain is not from the heart, then what is causing it?

There are many different causes of non-cardiac chest pain in children. Some of the more common ones are listed below.

- 1) Musculoskeletal pain.** This type of chest pain comes from the chest wall, which includes the bones, cartilage, and muscles that surround the heart and lungs. This kind of pain can occur from trauma to the chest, or from doing physical activities that irritate the chest wall (e.g. coughing or lifting weights). Other times, it may be difficult to identify the exact cause.

Specific examples include:

Precordial catch syndrome. This is a sharp, stabbing chest pain that can be very painful, but is not dangerous. The pain typically comes on at random times, gets worse with taking a deep breath (sometimes causing the child to “freeze” or take shallow breaths), and is relatively brief, lasting anywhere from a few seconds to 15-20 minutes. The cause of precordial catch is not known, but it is thought to be from a muscle spasm or irritation of a nerve. It does not require treatment.

Costochondritis, or inflammation of the cartilage that connects the ribs to the sternum. The cause of this is often unknown. This type of chest pain can be quite severe, but it is not dangerous. The pain gets worse with movement, coughing, or taking a deep breath, and touching the affected area can make the pain worse. This type of pain can take several weeks to resolve, and is treated with NSAID's such as ibuprofen.

Slipping rib. This type of pain occurs in the lower ribs or upper abdomen. It is caused by hypermobility of the ligaments that connect the ribs to each other. This type of pain typically occurs with certain movements, such as twisting (e.g. rolling over in bed), coughing, bending, lifting, swimming, or throwing. Some patients describe a “popping” sensation. If treatment is needed, NSAID's or physical therapy can be helpful.

Hypermobility syndromes. Patients with hypermobility, such as those with Ehlers Danlos syndrome, can experience musculoskeletal chest pain. This is because their joints tend to be

loose and more prone to inflammation. Working with a physical therapist who specializes in hypermobility disorders can be helpful.

2) Lung causes of chest pain. The most common lung-related type of chest pain is *asthma*. In addition to chest pain, symptoms of asthma can include a sensation of chest tightness, breathing difficulty, wheezing, or coughing. Some children identify chest pain as their primary symptom when they are experiencing asthma; this is especially true of exercise-induced asthma.

There are other lung-related causes of chest pain, but they are rare. These include a collapsed lung (pneumothorax) or infection (pneumonia).

3) Anxiety. Several studies have shown a link between psychological factors, such as stressful events, panic attacks, or anxiety, and chest pain. This does not mean that the child is not truly experiencing chest pain. In fact, children (and adults) with anxiety may experience other physical complaints as well, including headaches, abdominal symptoms, palpitations, and joint pains. Chest pain can further exacerbate the child's anxiety, leading to a vicious cycle. Referral to a behavioral health specialist to teach coping mechanisms such as breathing exercises, meditation, or exercise has been shown to be helpful.

4) Gastrointestinal causes.

Heartburn. Clues that a child's chest pain could be due to heartburn include timing after eating certain foods, pain that is worse lying down, associated abdominal symptoms such as stomach aches or vomiting, or the feeling of something coming up into the throat. This can be treated with dietary changes or acid blockers.

Constipation. Constipation can be a cause of chest pain. This is due to a combination of factors, including nerve pathways that are common to both the intestines and the chest, and stretching of the diaphragm (the muscle between the abdomen and the chest). Treatment of constipation has been shown to significantly relieve chest pain in affected children.

Other gastrointestinal causes of chest pain include problems with the esophagus (esophagitis, esophageal spasm), gastritis (inflammation of the stomach), gall bladder disease, or intestinal problems like irritable bowel syndrome.

5) Idiopathic chest pain

"Idiopathic" chest pain means that an underlying cause for the pain cannot be identified. Up to 74% of chest pain in children is idiopathic, meaning that no cardiac or other cause for the chest pain can be found. Although it can be frustrating not to be able to identify a cause for the pain, especially if the pain has been frequent or occurring for a long time, the good thing is that idiopathic chest pain is not dangerous and does not require treatment.