Identifying and Treating Chest Pain

Nationwide Children's
When your child needs a hospital, everything matters.℠

Pediatric Chest Pain

In pediatrics, chest pain has a variety of symptomatic levels and causes. It can range from a sharp stab to a dull ache, a crushing or burning sensation, even pain that travels up to the neck, jaw and back. Chest pain can be cause for alarm in both patients and parents and warrants careful examination and treatment.

Pediatric chest pain can be broadly classified as cardiac chest pain or non-cardiac chest pain.

Noncardiac Chest Pain

Non-cardiac chest pain is, by far, the most common cause of chest pain in children and adolescents, accounting for 98 percent of concerns. Patients are often unnecessarily referred to a pediatric cardiologist for symptoms that may be temporary or unrelated to more urgent heart related concerns. Non-cardiac causes of chest pain are musculoskeletal, pulmonary, gastrointestinal and miscellaneous.

The most common cause of chest pain in children and adolescents is musculoskeletal or chest-wall pain. Reassurance, rest and analgesia are the primary treatments for musculoskeletal chest pain. In most circumstances, allaying the fears of the patient and parents by counseling them about the benign nature of the condition helps to relieve concern for and reduce the degree of chest pain.

Cardiac Chest Pain

Chest pain due to a cardiac condition is rare in children and adolescents, with a prevalence of less than 6 percent. Causes of cardiac chest pain include inflammation, increased myocardial demand or decreased oxygen supply, left ventricular outflow tract obstruction and coronary artery abnormalities.

CARDIAC CONDITION	DESCRIPTION
Inflammatory Causes	Inflammatory causes of cardiac chest pain include pericarditis, myocarditis and endocarditis.
Left Ventricular Outflow Tract Obstruction	Aortic valve stenosis is characterized by a harsh ejection systolic murmur with radiation to the neck, which is heard on auscultation.
Coronary Artery Abnormalities	Myocardial ischemia in patients who have abnormal coronary artery connections present initially with anginal chest pain, usually associated with exertion. Characterized by squeezing sensation, tightness, pressure, constriction, burning or fullness in the chest. Infant patients also usually present with irritability, drawing of their knees up to their abdomens after feeding, pallor, diaphoresis and circulatory shock. These infants are often misdiagnosed as having colic.
Kawasaki disease (KD)	Coronary artery abnormalities are a well-known complication of KD, and patients who have been treated for KD should be monitored for heart problems.
Hypercholesterolemia	Nonfasting serum total cholesterol concentration should be tested per AAP guidelines. Hypercholesterolemia leading to coronary artery abnormalities may present within the first 20 years of life in patients born with homozygous familial hypercholesterolemia. While this is the case, it is quite rare.

Evaluating Your Patient

In order to best determine the cause of chest pain, gathering information from the patient history, physical examination and recommended tests is essential to evaluating your patient before referral.

PHYSICAL EXAMINATION		
☐ Vital signs	☐ Reproducible chest pain	☐ Abnormal loud second heart
☐ Dysmorphic features	☐ Hyperdynamic precordium	☐ Systolic clicks or murmurs
☐ Peripheral pulses	☐ Irregular heart beats	☐ Gallops
☐ Chest inspection	☐ Distant heart sounds	☐ Absent femoral pulses

TEST

A chest radiograph may be performed to evaluate for:

- ☐ Bony lesions
- ☐ Cardiomegaly
- ☐ Airways
- ☐ Lung parenchyma
- ☐ Pleural lesions

ECG is useful for evaluation of:

- ☐ Rate and rhythm
- ☐ Signs of ischemia
- ☐ Pericarditis
- ☐ Chamber hypertrophy

When to Refer to a Pediatric Cardiologist

Patients who have the clinical features of musculoskeletal chest pain and no other noteworthy findings do not require additional evaluation or referral. Those who have a significant history or abnormal findings on physical examination should have additional diagnostic evaluation and a referral to a pediatric cardiologist if cardiac disease is suspected.

Description of Chest Pain

☐ Any child or adolescent patient who has chest pain associated with exertion, palpitations, sudden syncope (especially during exercise) or abnormal findings on cardiac examination or ECG

Medical History

- ☐ Recent transcatheter Cardiac surgery or intervention, including device closure or stent placements
- ☐ Kawasaki Disease
- ☐ Congenital Heart Disease
- ☐ Cardiac surgery
- ☐ Cardiomyopathy
- ☐ Heart transplantation who experience myocardial ischemia who show symptoms of nausea or vomiting with eating or activity
- ☐ Patients who have had a Mustard or Senning procedure for d-TGA
- ☐ Patients who have had Fontan palliation for a single ventricle

Family History

- ☐ Genetic syndrome
- ☐ Sudden cardiac death
- ☐ High risk for coronary artery disease
- ☐ Cardiomyopathy
- ☐ Hypercholesterolemia

Referrals and Consultations

Online: **NationwideChildrens.org**

Phone: **(614) 722-6200** or **(877) 722-6220** | Fax: **(614) 722-4000**

Physician Direct Connect Line for 24-hour urgent physician consultations:
(614) 355-0221 or **(877) 355-0221**

W5604 12/2017