

# Pectus Excavatum

## FAST FACTS

**1 in  
300–400**

prevalence of pectus excavatum

**80:20**

male to female ratio of pectus excavatum patients

**15.2 years**

mean age at surgery

**40%**

family history of pectus

**10–20%**

of patients with pectus have associated connective tissue disease

Pectus excavatum (PE) is a deformity of the cartilaginous portion of the anterior ribs where they attach, causing the sternum to be pushed inward and resulting in a caved-in or sunken appearance. The most common chest wall deformity, PE is 3–5 times more likely to occur in males than females.

Patients may present either at or shortly after birth, or during the prepubertal growth spurt. Concavity of the sternum may result in compression of the heart or cause restrictive lung disease. Despite common cardiac compression, younger children and teens may display minimal symptoms due to the flexibility of the chest wall and enhanced compensatory mechanisms of youth.

## ASSESSMENT

Perform a standard history and physical examination with probing questions around cardiopulmonary symptoms. Look for an indentation of the chest wall. Assess the back for associated scoliosis. Assess for hypermobility and other signs of Ehlers-Danlos or Marfan's disease. Question patient regarding psychosocial issues including disturbed body image, depression, and/or social isolation.

## HPE (HISTORY AND PHYSICAL EXAM) RED FLAGS

- Chest pain
- Shortness of breath, at rest or with exertion
- Irregular heartbeat, heart murmur
- Exercise intolerance
- Fatigue
- Abnormal spinal curvature
- Generalized hypermobility
- Other symptoms of Ehlers-Danlos, Marfan's, Noonan, or postural orthostatic tachycardia syndrome

Cardiopulmonary symptoms may progress with age as the chest wall becomes less flexible and the patient's ability to compensate for the fixed pressure on the heart decreases. Significant cardiopulmonary dysfunction associated with PE may increase with age and severity of the defect and can be improved through repair.

## WHEN TO REFER

Refer any patient with concerns for a chest wall condition whenever it is identified on clinical evaluation to Cincinnati Children's Chest Wall Center for further evaluation and treatment.



If you would like additional copies of this tool, or would like more information, please contact the Physician Outreach and Engagement team at Cincinnati Children's.

If you have clinical questions about patients with pectus excavatum, email [chest-wall-center@cchmc.org](mailto:chest-wall-center@cchmc.org)

# Pectus Excavatum

## Inclusion Criteria

- Patient with sunken chest wall

## Patient Presents

## Standard Workup

### Situational History

- Chest pain
- Shortness of breath
- Exercise intolerance
- Fatigue
- Palpitations
- Psychological impact

### Family History

- Marfan's syndrome
- Ehlers-Danlos syndrome
- Noonan syndrome
- Postural orthostatic tachycardia syndrome

### Physical Exam

- Sunken chest wall
- Irregular heartbeat, heart murmur
- Abnormal spinal curvature
- Generalized hypermobility

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**Refer all patients with concern for pectus excavatum to Cincinnati Children's Chest Wall Center for consultation.**

At consultation, recommendations for treatment will be made based on age, severity of defect, and symptoms.

## Expected management depending on child's age and severity of defect

### Age 0–6 years

- Reassure
- Annual follow-up

### Age 6–10 years

- Annual follow-up
- Vacuum bell (non-surgical treatment)—first line therapy
- Surgery (minimally invasive Nuss procedure)—only for severe, symptomatic defects in this age group

### Age 11–16 years

- Annual follow-up
- Vacuum bell (non-surgical treatment) if milder defect and chest wall remains flexible
- Surgery (minimally invasive Nuss procedure)—most common in this age group

## Standard preoperative evaluation for pectus excavatum

### Cardiac MRI

- To assess depth of pectus, cardiac compression, anatomy and function

### EKG

- To assess heart rhythm

### Cardiopulmonary exercise test

- To rule out cardiac or pulmonary limitation to exercise

### Pulmonary function test

- To evaluate lung function

For urgent issues, or to speak with the specialist on call 24/7, call the Physician Priority Link® at 1-888-987-7997.