Resources for Patients and Families

Financial Assistance
Nationwide Children's works with all insurers to satisfy and meet requirements for coverage.

Welcome Center
We understand that traveling away from home for health care can bring special stresses to your patients and their families. To help, our Welcome Center supports many of the unique needs of those arriving here from outside central Ohio, including:

- Clinical arrangements
- Housing and transportation
- Ronald McDonald House – for extended stays
- Financial counseling to assist families with questions related to coverage for health care services, and specifically for out-of-network coverage
- Interpreters
- Sibling care
- Pastoral care

More information about the Welcome Center is available at NationwideChildrens.org/WelcomeCenter.

For an urgent consultation, call the Physician Direct Connect Line at (614) 355-0221 or (877) 355-0221. To make a referral, call (614) 722-6200 or (877) 722-6220, fax (614) 722-4000, or visit **NationwideChildrens.org/ChestWall.**

CH1564.06.12.xxxx

Surgery

Diagnosis and Treatment of Chest Wall Deformities

NATIONWIDE CHILDREN'S

When your child needs a hospital, everything matters.℠

The Chest Wall Clinic at Nationwide Children's Hospital

Pectus deformities affect approximately one in 400 people and usually become more severe during adolescent growth years. If untreated, adults experience increasing symptoms with advancing age.

The Chest Wall Clinic at Nationwide Children's Hospital provides comprehensive evaluation and treatment of disorders affecting the chest wall including pectus excavatum, pectus carinatum, rib deformities and chest wall tumors. Our minimally invasive surgical techniques, including the Nuss procedure, provide reduced scarring and a faster return to regular activities for patients.

Patients receive comprehensive treatment from a multidisciplinary team that includes, but is not limited to, nurses, anesthesiologists, and occupational and physical therapists.

Often patients require evaluation by cardiology and pulmonary medicine. When these interventions are needed, they work in concert with the physicians and staff of the Chest Wall Clinic to care for the patient. These patients also require radiologic evaluations including plain radiologic chest films and sometimes computed tomography of the chest. Those patients who require surgery are given close attention to pain control and early initiation of physical therapy.

Common Chest Wall Deformities

Pectus Excavatum
Pectus excavatum is the most common chest wall disorder treated at Nationwide Children's. Pectus excavatum is a deformity that occurs in approximately one out of 1,000 children. It is characterized by a concavity of the sternum. The disorder is usually noted at birth as a mild condition but can become progressively more pronounced over time.

Additional symptoms and conditions can include:
- Chest pain
- Shortness of breath, especially on exertion
- Mitral valve prolapse
- Associated syndromes affecting skeletal growth
- Scoliosis

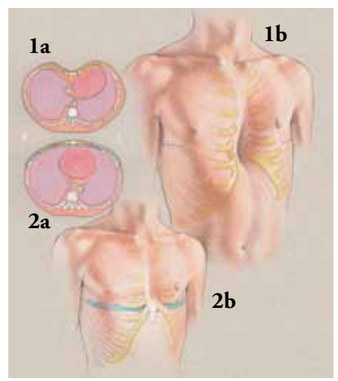

Figure 1a: cross-section of torso / 1b: front view of torso Illustrations show chest deformity pectus excavatum.

Figure 2a: cross-section of torso / 2b: front view of torso Illustrations show chest wall post surgery.

Pectus Carinatum
Pectus carinatum is characterized by a prominent sternum and is usually asymptomatic. Pectus carinatum occurs in approximately 20 percent of people with a pectus deformity. Of those diagnosed, three out of four pectus carinatum patients are males.

Additional symptoms and conditions can include:
- Chest pain
- Scoliosis
- Mitral valve prolapse
- Connective tissue disorders

Chest Wall Tumors
A variety of soft tissue tumors can present in the chest wall. Chest wall tumors include benign conditions, including neurofibromas and malignant tumors, such as soft tissue sarcomas (e.g., Ewings sarcoma, rhabdomyosarcoma and others).

Diagnosis and Treatment of Chest Wall Deformities

Making the Diagnosis
Chest wall deformities can be evident in infancy, but many also develop or become more obvious as children grow. Abnormalities are usually noted by the parents, but may be evident only to the physician and found during routine chest examination.

Other deformities may be noted by the patient. Because the chest wall develops over time, becoming less flexible after infancy, disorders may become more or less problematic with maturation of the chest wall.

Chest Wall Deformity Referrals
The optimal ages for chest wall deformity referrals are between 10 and 12 years. Patients are examined earlier if parents or the primary care physician have questions.

If patients are diagnosed after adolescence, they can still be examined to determine what their options are given the severity of the deformity. With any of these referrals, no pre-visit studies are needed.

Treatment for Pectus Excavatum
For those who require treatment, the most commonly performed procedure is a minimally invasive thoracoscopic surgery to correct the deformity by placing a prosthetic bar behind the sternum, known as the Nuss procedure. The bar is removed after three years and the defect has remodeled into a more symmetrically positioned sternum. The appropriate timing of surgery is typically in the early adolescent years, but patients undergo evaluation for this condition at any age.

This minimally invasive surgery is a marked improvement over traditional open surgery for treatment of pectus excavatum, meaning several advantages to your patients, including:
- Smaller incisions and reduced scarring
- Reduced operating time
- An approximate 90 percent decrease in blood loss
- An early return to regular activity
- Excellent cosmetic results

Treatment for Pectus Carinatum
While surgery has been used successfully in the past for pectus carinatum, recent success has been achieved with external prosthetic bracing. The custom brace is worn for nine to 12 months and has minimal impact on patients' activities. The rare patients who do not respond to bracing are usually amenable to surgery.

Treatment for Chest Wall Tumors
Treatment of chest wall tumors is dependent on factors such as the type of tumor and its location and size. Surgical interventions to remove the tumor are determined upon consultation with the surgeon.

Postoperative Care and Management

Postoperative care involves the management of pain in the first few weeks, as well as monitoring for signs of infection. Patients are followed very closely in the pediatric surgery clinic for the first three months to ensure steady return to normal activities.

Contact sports are not allowed until a minimum of three months following surgery. For patients with a surgical implant, the hardware is usually removed after three years.