

Policy: MP050

Section: Medical Benefit Policy

Subject: Surgical Correction of Chest Wall Deformities

Applicable Lines of Business

Commercial	X	CHIP	X
Medicare	X	ACA	X
Medicaid	X		

I. Policy: Surgical Correction of Chest Wall Deformities

II. Purpose/Objective:

To provide a policy of coverage regarding Surgical Correction of Chest Wall Deformities

III. Responsibility:

- A. Medical Directors
- B. Medical Management Department

IV. Required Definitions

1. Attachment – a supporting document that is developed and maintained by the policy writer or department requiring/authoring the policy.
2. Exhibit – a supporting document developed and maintained in a department other than the department requiring/authoring the policy.
3. Devised – the date the policy was implemented.
4. Revised – the date of every revision to the policy, including typographical and grammatical changes.
5. Reviewed – the date documenting the annual review if the policy has no revisions necessary.

V. Additional Definitions

Medical Necessity or Medically Necessary means Covered Services rendered by a Health Care Provider that the Plan determines are:

- a. appropriate for the symptoms and diagnosis or treatment of the Member's condition, illness, disease or injury;
- b. provided for the diagnosis, and the direct care and treatment of the Member's condition, illness disease or injury;
- c. in accordance with current standards of good medical treatment practiced by the general medical community;
- d. not primarily for the convenience of the Member, or the Member's Health Care Provider; and the most appropriate source or level of service that can safely be provided to the Member. When applied to hospitalization, this further means that the Member requires acute care as an inpatient due to the nature of the services rendered or the Member's condition, and the Member cannot receive safe or adequate care as an outpatient.

Medicaid Business Segment

Medically Necessary — A service, item, procedure, or level of care that is necessary for the proper treatment or management of an illness, injury, or disability is one that:

- Will, or is reasonably expected to, prevent the onset of an illness, condition, injury or disability.

- Will, or is reasonably expected to, reduce or ameliorate the physical, mental or developmental effects of an illness, condition, injury or disability.
- Will assist the Member to achieve or maintain maximum functional capacity in performing daily activities, taking into account both the functional capacity of the Member and those functional capacities that are appropriate for Members of the same age

Haller CT index: Gives an objective measurement for comparing the severity between different patients. It is derived from dividing the transverse diameter of the chest by the anterior-posterior diameter.

INDICATIONS:

Surgical repair of Pectus Excavatum and Pectus Carinatum is considered medically necessary if the insured individual meets **ALL** of the following criteria:

1. Well-documented evidence of severe functional impairment arising from the sternal deformity. Complications include but may not be limited to:
 - Cardiopulmonary impairment documented by respiratory and cardiac function tests;
 - Frequent lower respiratory tract infections;
 - Exercise limitations;
 - Atypical chest pain; **AND**
2. An EKG, stress test, echocardiogram, stress echo or cardiac catheterization documented to define the relationship between the cardiopulmonary impairment and the sternal deformity. **AND**
3. A CT scan of the chest that indicates one of the following:
 - a Haller CT index* greater than 3.25; or

For members with significant discrepancies of anterior-posterior to medial-lateral dimensions of the chest wall, a Correction Index** of 28% or higher

*Daunt SW, Cohen JH, Miller SF. Age-related normal ranges for the Haller index in children. Pediatric radiology 2004;34(4):326-330.

** St. Peter SD, Juang D, Garey CL, et al. A novel measure for pectus excavatum: the correction index. J Pediatr Surg 2011;46:2270-3.

LIMITATIONS:

Anatomic studies such as chest x-ray, chest CT scan or anteroposterior diameter without evidence of compromise of physiologic function will not be considered primary considerations for surgical correction.

EXCLUSIONS:

Surgical intervention to correct the sternal deformity in the absence of significant medically documented functional impairment and/or cardiopulmonary compromise is considered cosmetic/ not medically necessary and therefore **NOT COVERED**.

Medicaid Business Segment:

Any requests for services, that do not meet criteria set in the PARP, may be evaluated on a case by case basis.

Coding Associated With: Surgical Correction of Chest Wall Deformities

The following codes are included below for informational purposes and may not be all inclusive. Inclusion of a procedure or device code(s) does not constitute or imply coverage nor does it imply or guarantee provider reimbursement. Coverage is determined by the member specific benefit plan document and any applicable laws regarding coverage of specific services. Please note that per Medicare coverage rules, only specific CPT/HCPCS Codes may be covered for the Medicare Business Segment. Please consult the CMS website at www.cms.gov or the local Medicare Administrative Carrier (MAC) for more information on Medicare coverage and coding requirements

- 21740 Reconstructive repair of pectus excavatum or carinatum
- 21742 Reconstructive repair of pectus excavatum or carinatum, minimally invasive approach, without thoracoscopy
- 21743 Reconstructive repair of pectus excavatum or carinatum, minimally invasive approach, with thoracoscopy

LINE OF BUSINESS:

Eligibility and contract specific benefit limitations and/or exclusions will apply. Coverage statements found in the line of business specific benefit document will supersede this policy. For Medicare, applicable LCD's and NCD's will supercede this policy. For PA Medicaid Business segment, this policy applies as written.

REFERENCES:

- Fonkasrud EW, Bustorff-Silva J, "Repair of Pectus Excavatum and carinatum in Adults", *American Journal of Surgery*, 177(2):121-124, Feb 1999
- Hollands CM, Puglisi R, Burnweit CA, Nahmad M, Nuss DM, "Minimal Access Repair of Pectus Excavatum – The Nuss Procedure", *Pediatrics* 102(3) Supplement To Pediatrics, Part 2 of 2:789, Sept 1998.
- Wu PC, Knauer EM, McGowan GE, Hight DW, "Repair of Pectus excavatum Deformities in Children: A New Perspective of Treatment Using Minimal Access Surgical Technique", *Archives of Surgery*, 136(4):419-424, April 2001.
- Quigley PM, Haller JA, Jelus KL, Loughlin GM, Marcus CL, "Cardiorespiratory Function Before and After Corrective Surgery in Pectus Excavatum", *Journal of Pediatrics*, 128(5): 638-643, May 1996.
- Mocchegiani R, Badano L, Lestuzzi Cnicolosi GL, Zanuttini D, "Relation of Right Ventricular Morphology and Function in Pectus Excavatum to the Severity of the Chest Wall Deformity", *American Journal of Cardiology*, 76(12):941-946, Nov 1995.
- Chen CL,"Long Term Results of Surgical Correction of Pectus Excavatum", *Chest* 112(3) Supplement 3:150S, Sept 1997.
- Lacquet LK, Morshuis WJ, Folgering HT, " Long Term Results after Correction of Anterior Chest Wall Deformities", *Journal of Cardiovascular Surgery*. 39(5):683-688, Oct. 1998.
- Ells DG,"Chest Wall Deformities", *Pediatrics Review*. 11(5):147-151. Nov. 1989.
- Pickard LR, Tepas JJ, Shermeta DW, Haller JA Jr., "Pectus Carinatum: Results of Surgical Therapy" *Journal of Pediatric Surgery*. 1979 Jun;14(3):228-230
- Goretsky MJ, Kelly RE Jr., Croitoru D, Nuss D. "Chest Wall Anomalies: Pectus Excavatum and Pectus Carinatum" *Adolesc Med* 15 (2004) 455-471
- Kim DH, Hwang JJ, Lee MK, Lee DY, Paik HC. " Analysis of the Nuss Procedure for Pectus Excavatum in Different Age Groups" *Ann Thorac Surg* 2005; 80:1073-7.
- Park HJ, Lee SY, Lee CS, Youm W, Lee KR. " The Nuss procedure for pectus Excavatum: Evolution of Techniques and Early Results on 300 Patients" *Ann thorac Surg* 2004; 77:289-95
- Sigalet DL, Montgomery M, Harder J, Wong V, Kravarusic D, Alassiri A. Long term cardiopulmonary effects of closed repair of pectus excavatum. *Pediatr Surg Int*. 2007 May;23(5):493-7.
- Kubiak R, Habelt S, Hammer J, Hacker FM, Mayr J, Bielek J. Pulmonary function following completion of minimally invasive repair for pectus excavatum. *Eur J Pediatr Surg* 2007 Aug;17(4):255-60.
- Kelly RE, Shamberger RC, Mellins RB et al. Prospective multicenter study of surgical correction of pectus excavatum: desing, perioperative complications, pain, and baseline pulmonary function facilitated by internet-based data collection. *J Am Coll Surg* 2007 Aug;205(2):205-16.
- Up to Date. Diseases of the chest wall.
- Hamdi M, Blondeel P, Van Landuyt K, et al. Bilateral autogenous breast reconstruction using perforator free flaps: A single center's experience. *Plast Reconstr Surg*. 2004;114(1):83-89; discussion 90-92.
- Freitas Rda S, Tolazzi AR, Martins VD, et al. Poland's syndrome: Different clinical presentations and surgical reconstructions in 18 cases. *Aesthetic Plast Surg*. 2007;31(2):140-146.

Marks MW, Iacobucci J. Reconstruction of congenital chest wall deformities using solid silicone onlay prostheses. Chest Surg Clin N Am. 2000;10(2):341-355.

Hodgkinson DJ. The management of anterior chest wall deformity in patients presenting for breast augmentation. Plast Reconstr Surg. 2002;109(5):1714-1723.

Borschel GH, Izenberg PH, Cederna PS. Endoscopically assisted reconstruction of male and female Poland syndrome. Plast Reconstr Surg. 2002;109(5):1536-1543.

Esteves E, Paiva KC, Calcagno-Silva M, Chagas CC, Barbosa-Filho H. Treatment of pectus excavatum in patients over 20 years of age. J Laparoendosc Adv Surg Tech A. 2011 Jan 8

Sigl S, Del Frari B, Harasser C, Schwabegger AH. The effect on cardiopulmonary function after thoracoplasty in pectus carinatum: A systematic literature review. Interact Cardiovasc Thorac Surg. 2018;26(3):474-479.

Oswald N, Jalal Z, Kadiri S, Naidu B. Changes in chest wall motion with removal of Nuss bar in repaired pectus excavatum - a cohort study. J Cardiothorac Surg. 2019;14(1):4.

Linton SC, Ghomrawi HMK, Tian Y, et al. Association of operative volume and odds of surgical complication for patients undergoing repair of pectus excavatum at children's hospitals. J Pediatr. 2021 Dec 27

Brungardt JG, Chizek PW, Schropp KP. Adult pectus excavatum repair: national outcomes of the Nuss and Ravitch procedures. J Thorac Dis. 2021 Mar;13(3):1396-1402.

van Braak H, de Beer SA, Zwaveling S, et al. Ravitch surgery or dynamic compression bracing for pectus carinatum: a retrospective cohort study. Ann Thorac Surg. 2022 Nov 14:S0003-4975(22)01428-X

Sollie ZW, Gleason F, Donahue JM, et al. Evolution of technique and results after permanent open repair for pectus deformities. JTCVS Tech. 2022 Jan 19;12:212-219

Norlander L, Sundqvist AS, Anderzén-Carlsson A, et al. Health-related quality of life after Nuss procedure for pectus excavatum: a cross-sectional study. Interact Cardiovasc Thorac Surg. 2022 Jun 15;35(1):ivac031

This policy will be revised as necessary and reviewed no less than annually.

Devised: 9/99

Revised: 12/01, 12/02 (add medical necessity definition); 10/03 change title, add pectus carinatum
09/05 (defined Haller CT and Extended Criteria); 10/09 (criteria); 5/16 (Removed PA); 10/16 (cited reference for Haller Index)

Reviewed: 10/04, 10/06, 10/07, 10/08, 10/10, 10/11, 10/12, 10/13, 10/14, 10/15, 9/17, 9/18; 9/19, 9/20, 9/21, 9/22, 9/23

Geisinger Health Plan may refer collectively to health care coverage sponsors Geisinger Health Plan, Geisinger Quality Options, Inc., and Geisinger Indemnity Insurance Company, unless otherwise noted. Geisinger Health Plan is part of Geisinger, an integrated health care delivery and coverage organization.

Coverage for experimental or investigational treatments, services and procedures is specifically excluded under the member's certificate with Geisinger Health Plan. Unproven services outside of an approved clinical trial are also specifically excluded under the member's certificate with Geisinger Health Plan. This policy does not expand coverage to services or items specifically excluded from coverage in the member's certificate with Geisinger Health Plan. Additional information can be found in MP015 Experimental, Investigational or Unproven Services.

Prior authorization and/or pre-certification requirements for services or items may apply. Pre-certification lists may be found in the member's contract specific benefit document. Prior authorization requirements can be found at <https://www.geisinger.org/health-plan/providers/ghp-clinical-policies>

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