

Standard of Care: Costochondritis

ICD 10 Codes: M94.0 (Chondrocostal Junction Syndrome)

Case Type / Diagnosis: Costochondritis; Tietze's Syndrome

Costochondritis (CC) is a benign inflammatory condition of the costochondral or costosternal joints that causes localized pain.³ The onset is insidious. The etiology is not clear, but it is most likely related to repetitive trauma, a recent cough, or recent strenuous activity.³ Symptoms include intermittent pain at the costosternal joints and tenderness to palpation. It most frequently occurs unilaterally at ribs 2-5, but can occur at other levels as well. The epidemiology of CC is not well documented, but there is thought to be a higher frequency in females and in Hispanics.⁴

The chest wall is made up of the ribs, which connect the vertebrae posteriorly and with the sternum anteriorly. Posteriorly, the twelve ribs articulate with the spine through both the costovertebral and costotransverse joints forming the most hypomobile region of the spine. Anteriorly, ribs 1-7 articulate with the costocartilage at the costochondral joints. The costocartilage then attaches directly to the sternum at the costosternal joints, which are synovial joints. Ribs 8-10 attach to the sternum via the cartilage at the rib above, while ribs 11 and 12 are floating ribs, without an anterior articulation.

There are many causes of musculoskeletal chest pain arising from the ribs and their articulations, including rib trauma, rib fractures, slipping rib syndrome, costovertebral arthritis and Tietze's syndrome. CC is often misnamed as Tietze's syndrome, a rare condition which is characterized by localized swelling of a single costal cartilage, usually at the 2nd or 3rd rib. Tietze's syndrome is typically associated with infectious, rheumatologic or neoplastic processes.³

Indications for Treatment:

Anterior chest wall pain often described as sharp, aching, or pressure-like that can typically be reproduced with palpation, upper extremity movement, deep breathing, or exertion. Differential diagnosis (see below) is important to ensure that symptoms are not cardiac related.

Contraindications / Precautions for Treatment:

It is essential to rule out causes of chest pain that are not musculoskeletal in nature such as myocardial infarction, angina, pulmonary embolism, neoplasm or chest infection.¹ Symptoms that are suggestive of non-musculoskeletal cause include: exertional pain, numbness, fever, chills, cough, dyspnea, or respiratory findings. Individuals > 35 years old with a risk or history of coronary artery disease or with cardiopulmonary symptoms should have an electrocardiogram and chest x-ray to ensure that symptoms are not cardiac in origin. Patients with fever, cough, chest wall swelling, or respiratory findings should have radiographic imaging. A chest CT scan is appropriate if there is suspicion of an infectious or neoplastic process. Nuclear scanning with

Standard of Care: _____

scintigraphy has previously been studied to determine its usefulness in diagnosing patients with costochondritis but was not found to be specific.³

Evaluation:

Medical History: Review pertinent medical records and the patients past medical history. Screen for any cardiac history or history of thoracic surgeries. Review imaging, such as chest x-rays, CT scans, EKGs, and echocardiograms.

History of Present Illness: Onset is often associated with recent cough, recent strenuous activity, or recent activity with significant upper extremity involvement. Consider the date of onset and length of time symptoms have been present. Symptom aggravants typically include deep breathing, exertional activities/cardiovascular exercise, and/or lifting heavy objects.³

Social History: Consider the patients home environment, role in the home, work, and hobbies.

Medications: Patients may be using acetaminophen, non-steroidal anti-inflammatory drugs, or other analgesics. Refractory cases of CC may be treated with local injections such as lidocaine or a corticosteroid.³

Examination

This section is intended to capture the most commonly used assessment tools for this case type/diagnosis. It is not intended to be either inclusive or exclusive of assessment tools.

Pain: Pain should be rated on VAS scale 0 to 10. Pain is typically described as sharp, aching, or pressure-like. Pain is typically unilateral along the costochondral joints of ribs 2-5.³

Palpation: Chest wall palpation will typically identify tenderness unilaterally along the costochondral or costosternal joints of ribs 2-5. It is also recommended to palpate the thoracic spine, ribcage, sternum, cervical spine, clavicle, and shoulders. Visually observe for a rash consistent with Herpes Zoster.³ It is unusual to identify localized swelling with costochondritis, this is more consistent with Tietze's syndrome.⁵

ROM: Assess ROM of the shoulder as mobility of the UE on the involved side will usually provoke chest wall pain.³ Additional impairment measures can be identified by assessing thoracic extension ROM as well as monitoring for rib movement with deep inhalation.

Joint Play Assessment: Segmental mobility of the thoracic spine should be assessed as well as rib mobility. Assess for end feel, mobility, and pain provocation.²

Standard of Care: _____

Strength: Given postural dysfunction which can be associated with costochondritis, it is recommended to assess strength of deep cervical flexors and periscapular muscles.

Posture/alignment: Assess sitting and standing posture as this may further exacerbate symptoms of costochondritis.⁵

Muscle Length: Assess length of upper trapezius, scalenes, pectoralis major, pectoralis minor, latissimus dorsi.⁵

Functional Outcomes: No special tests have been identified as valid for differential diagnosis of costochondritis. The Patient Specific Functional Scale (PSFS) is a functional outcome measure documented in the literature for costochondritis but there is no costochondritis specific functional outcome measure.⁵

Differential Diagnosis: sternocostal arthritis, fibromyalgia, herpes zoster, slipping rib syndrome, Tietze syndrome, infection, neoplasm, painful xiphoid syndrome, traumatic muscle overuse/myalgias, myocardial infarction.^{2,3}

Assessment:

Problem List

- Pain
- Palpatory tenderness
- Limitations in shoulder, cervical, thoracic, or rib range of motion
- Decreased mobility with joint play assessment
- Strength limitations
- Postural impairments
- Decreased muscle length
- Functional impairments

Prognosis: Costochondritis typically resolves within one year; most frequently it lasts weeks to several months. It can be recurring depending on an individual's occupational demands and hobbies (repetitive movement of the UE, lifting, or cardiovascular exercise).⁵

Goals

- Established impairment-based goals that align with above mentioned problem list.
- Establish functional goals based on household activities, occupational activities, hobbies, and sports participation.

Standard of Care: _____

Treatment Planning / Interventions

Interventions most commonly used for this case type/diagnosis.

This section is intended to capture the most commonly used interventions for this case type/diagnosis. It is not intended to be either inclusive or exclusive of appropriate interventions.

There is little high-quality research into physical therapy intervention for costochondritis, but the following published treatments are noted in case studies and case series.^{2,5}

- Patient education regarding activity modification and proper body mechanics

Impairment based treatment model including:

- Manual therapy to the thoracic spine and CT junction
- 1st and 2nd rib mobilizations
- PA mobilizations and manipulations of ribs 3-10.
- Stretching of pec major/minor, latissimus dorsi, upper trapezius, scalenes
- Cupping along the rib cage.
- Strengthening of peri-scapular muscles and deep cervical flexors.
- Home exercise program to maintain mobility gained with manual therapy.

Medical treatment for costochondritis may include acetaminophen and anti-inflammatory medication. Refractory cases of CC may be treated with local injections such as lidocaine or a corticosteroid.³

Frequency & Duration: Most likely, pt will benefit from PT at 1x/week for up to 4 weeks with an emphasis on progressing to independent self-management.^{2,5}

Patient / family education: As noted in treatment section, instruct patient in proper posture, avoidance of aggravating activities and proper ergonomics and body mechanics to reduce aggravation of costochondral junction. Instruct the patient in a home program with therapeutic exercises to correct any muscle imbalances found on the examination.

Recommendations and referrals to other providers

Return to referring MD, especially if you suspect cardiac issues. Symptoms that are suggestive of non-musculoskeletal cause include: exertional pain, numbness, fever, chills, cough, dyspnea, or respiratory findings. Individuals > 35 years old with a risk or history of coronary artery disease or with cardiopulmonary symptoms should have an electrocardiogram and chest x-ray to ensure that symptoms are not cardiac in origin. Patients with fever, cough, chest wall swelling, or respiratory findings should have radiographic imaging. A chest CT scan is appropriate if there is suspicion of an infectious or neoplastic process.³ If chest pain of cardiac origin is suspected and emergent, refer to emergency room or call emergency services.

Standard of Care: _____

Re-evaluation

Standard Time Frame- 30 days or less if appropriate

Other Possible Triggers- change in symptoms, worsening symptoms, failure to respond to treatment or onset of cardiac chest pain.

Discharge Planning

Commonly expected outcomes at discharge: Patient will have met goals noted above with focus on self-management of symptoms through activity modification.

Transfer of Care: Return to referring MD if no improvement for further medical management. Patient may be referred to cardiologist if cardiac origin is suspected.

Patient's discharge instructions Continue with home exercise program, postural correction, and self-management of pain. Follow up with MD if pain persists.

Is a BWH clinical competency associated with the document: NO

Revised: Karen Lovely, PT, DPT
December 2022

Reviewed by: Amy Butler, PT

Standard of Care: _____

REFERENCES

1. Ayloo A, Cvengros T, Marella S. Evaluation and treatment of musculoskeletal chest pain. *Primary Care Clin Office Pract.* 2013;40:863-887.
2. Barranco-Trabi J, Mank V, Roberts J, Newman DP. Atypical costochondritis: complete resolution of symptoms after rib manipulation and soft tissue mobilization. *Cureus.* 2021;13(4):e14369.
3. Proulx AM, Zyrd TW. Costochondritis: diagnosis and treatment. *American Family Physician.* 2009;80(6):617-620.
4. Schumann JA, Sood T, Parente JJ. Costochondritis. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK532931/>
5. Zaruba RA, Wilson E. Impairment based examination and treatment of costochondritis: a case series. *The International Journal of Sports Physical Therapy.* 2017;12(3): 458-467.

Standard of Care: _____