Chest Pain

Office Hours Telephone Triage Protocols | Adult | 2015

Schmitt-Thompson Clinical Content

DEFINITION

- Uncomfortable pressure, fullness, squeezing, or other pain in the chest.
- This includes the area from the clavicles to the bottom of the rib cage.
- Not due to a traumatic injury.

TRIAGE ASSESSMENT QUESTIONS FOR CHEST PAIN

Call EMS 911 Now

SEVERE difficulty breathing (e.g., struggling for each breath, speaks in single words)

R/O: respiratory failure, hypoxia, acute pulmonary edema

Passed out (i.e., fainted, collapsed and was not responding)

R/O: shock

Chest pain lasting longer than 5 minutes and ANY of the following:
* Over 50 years old
* Over 30 years old and at least one cardiac risk factor (i.e., high blood pressure, diabetes, high cholesterol, obesity, smoker or strong family history of heart disease)
* Pain is crushing, pressure-like, or heavy
* Took nitroglycerin and chest pain was not relieved
* History of heart disease (i.e., angina, heart attack, bypass surgery, angioplasty, CHF)

R/O: myocardial infarction, acute coronary syndrome

Visible sweat on face or sweat dripping down face

R/O: myocardial infarction, acute coronary syndrome

Sounds like a life-threatening emergency to the triager

See More Appropriate Protocol

Followed an injury to chest

Go to Guideline: Chest Injury (Adult)

Go to ED Now

SEVERE chest pain

Pain also present in shoulder(s) or arm(s) or jaw

R/O: acute coronary syndrome

Difficulty breathing

Cocaine use within last 3 days

Reason: cocaine can precipitate acute coronary syndrome

History of prior 'blood clot' in leg or lungs (i.e., deep vein thrombosis, pulmonary embolism)

Note: a "blood clot" typically would have required treatment with heparin or coumadin. Reason: increased risk of thromboembolism. R/O: deep vein thrombosis

Recent illness requiring prolonged bed rest (i.e., immobilization)

R/O: pulmonary embolism

Hip or leg fracture in past 2 months (e.g, or had cast on leg or ankle)

R/O: pulmonary embolism

Major surgery in the past month

R/O: pulmonary embolism

Recent long-distance travel with prolonged time in car, bus, plane, or train (i.e., within past 2 weeks; 6 or more hours duration)

Reason: immobilization during prolonged travel increases risk of pulmonary embolus

Heart beating irregularly or very rapidly

R/O: SVT, tachyarrhythmia

Go to ED Now (or to Office with PCP Approval)

Chest pain lasting longer than 5 minutes

Reason: chest pain is a high-risk complaint; referral for evaluation

Intermittent chest pain and pain has been increasing in severity or frequency

R/O: unstable angina

Dizziness or lightheadedness

Coughing up blood

Patient sounds very sick or weak to the triager

Reason: severe acute illness or serious complication suspected

See Today in Office

Fever > 100.5° F (38.1° C)

Intermittent chest pains persist > 3 days

All other patients with chest pain

Alternate Disposition: Have physician speak directly with patient

Patient wants to be seen

Home Care

Intermittent mild chest pain lasting a few seconds each time

Home Care Advice for Mild Chest Pain

1.] **Fleeting Chest Pain:** Fleeting chest pains that last only a few seconds and then go away are generally not serious. They may be from pinched muscles or nerves in your chest wall.

2.] **Chest Pain Only When Coughing:** Chest pains that occur with coughing generally come from the chest wall and from irritation of the airways. They are usually not serious.

3.] **Cough Medicines:**
• **OTC Cough Syrups**: The most common cough suppressant in OTC cough medications is dextromethorphan. Often the letters "DM" appear in the name.
• **OTC Cough Drops**: Cough drops can help a lot, especially for mild coughs. They reduce coughing by soothing your irritated throat and removing that tickle sensation in the back of the throat. Cough drops also have the advantage of portability - you can carry them with you.
• **Home Remedy - Hard Candy**: Hard candy works just as well as medicine-flavored OTC cough drops. Diabetics should use sugar-free candy.
• **Home Remedy - Honey**: This old home remedy has been shown to help decrease coughing at night. The adult dosage is 2 teaspoons (10 ml) at bedtime. Honey should not be given to infants under one year of age.

4.] **Expected Course:** These mild chest pains usually disappear within 3 days.

5.] **Call Back If:**
• Severe chest pain
• Constant chest pain lasting longer than 5 minutes
• Difficulty breathing
• Fever
• You become worse

FIRST AID

FIRST AID Advice for Shock: Lie down with the feet elevated.

FIRST AID ADVICE - Breathing Stopped or Cardiac Arrest

Hands-Only CPR

• Call 911.
• Push hard and fast on the center of the chest.

Special Notes:

• High quality CPR: Rescuers should push hard to a depth of at least 2 inches (5 cm), at a rate of at least 100 compressions per minute, allow full chest recoil, and minimize interruptions in chest compressions. The disco song "Stayin' Alive" has the right beat for CPR.
• The American Heart Association provides a 1 minute instructional video on Hands-Only CPR at: http://handsonlycpr.org/. Be prepared. Watch it now, before you need it!
• Answers to *Frequently Asked Questions* about Hands-Only CPR are available here: http://www.heart.org/HEARTORG/CPRAndECC/HandsOnlyCPR/LearnMore/Learn-More_UCM_440810_FAQ.jsp.
• The American Heart Association provides a free Hands-Only CPR App for the iPhone, PalmPre, and Android.
• You are strongly encouraged to get training in CPR from the American Red Cross or the American Heart Association.
• Hands-OnlyTM CPR is a trademark of the American Heart Association.

"All rescuers, regardless of training, should provide chest compressions to all cardiac arrest victims. Because of their importance, chest compressions should be the initial CPR action for all victims regardless of age. Rescuers who are able should add ventilations to chest compressions. Highly trained rescuers working together should coordinate their care and perform chest compressions as well as ventilations in a team-based approach." Source: 2010 AHA Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care.

CPR by Trained Rescuers

Trained (confident) rescuers should add ventilations to chest compressions while waiting for paramedics to arrive:

- Call 911.
- Perform chest compressions and mouth-to-mouth breathing in cycles of 30 compressions and then 2 breaths.

Special Notes:

- Rescuers should push hard to a depth of at least 2 inches (5 cm), at a rate of at least 100 compressions per minute, allow full chest recoil, and minimize interruptions in chest compressions.

BACKGROUND INFORMATION

Key Points

- Chest pain is a challenging symptom from a triage perspective as there are a number of potentially life-threatening causes of pain and no combination of symptoms that sufficiently discriminate serious from non-serious pain.
- A conservative stance in triaging these patients is recommended.

Serious Causes of Chest Pain

- *Acute coronary syndromes* (angina, myocardial infarction): Chest pain caused by atherosclerotic blockages in the coronary arteries is the most common cause of acute coronary syndromes. This chest pain syndrome is typically seen with exertion, unless the blockage in a particular coronary artery is complete and then pain occurs at rest. Acute myocardial infarctions result from a complete loss of blood supply to the blocked coronary artery involved, often the result of an acute thrombus formation in the diseased vessel or disruption of an atherosclerotic plaque. Atherosclerotic heart disease, also referred to as ischemic heart disease, remains the leading cause of death in adults in the United States. See the **CAUTION** statement below for further symptom description.
- *Pulmonary Embolus:* This potentially life-threatening process occurs when a clot, usually from a source in the lower extremities, dislodges and causes mechanical obstruction in the pulmonary arterial system of the lungs. The classic clinical picture is pleuritic chest pain, dyspnea, and hemoptysis. Some or all of these symptoms may be present. Risk factors include immobilization (e.g., bed bound, recent surgery, prolonged travel), trauma especially to the pelvis or lower extremities, and peripartum and hypercoaguable states (e.g., birth control pills, estrogen use, malignancy).
- *Pneumothorax*: Lung collapse can occur spontaneously or with trauma. The symptoms typically include pleuritic chest pain and dyspnea.
- *Thoracic aortic dissection*: A tear in the thoracic aorta usually presents with acute severe chest pain, often described as sharp and tearing in nature. This pain can be referred to the interscapular area. This disease entity is typically seen in the elderly.
- *Pericarditis*: Inflammation of the sac surrounding the heart or pericardium can result in positional chest pain, often pleuritic and dyspnea.

Other Less Serious Causes of Chest Pain

- *Pneumonia*: Some patients with pneumonia will complain of a sharp localized pleuritic pain. In general, any patient with pneumonia who is hypoxemic, has multilobe involvement, is unable to keep down liquids or medications, or is of advanced age or immunocompromised will require hospitalization.
- *Herpes Zoster:* Usually pain precedes the typical rash of grouped vesicles on a red base in a nerve root distribution.
- *Cholecystitis, cholelithiasis*: The typical pain of gallstone disease is in the epigastrium and right upper quadrant, crampy in nature, but can be confused with chest pain. Gallstone abdominal pain can radiate to the upper back in the region of the shoulder blade.
- *Costochondritis*: Caused by inflammation of the rib cartilages where they attach to the sternum in the front of the chest. The pain is usually sharp. The pain often is worse in by breathing in and it

usually hurts when one touches the area. Costochondritis is a diagnosis of exclusion in those with risk factors for the more serious and life-threatening causes of chest pain.
- *Rib-muscle strain*: Typically the pain is positional, localized, intermittent, and sharp
- *Reflux esophagitis*: Patients will often describe an acid or sour taste from the reflux of stomach contents and acid into the throat and mouth.

Myocardial Infarction - Should a Telephone Triage Nurse Recommend Aspirin?

- **Background**. Research has shown that early administration of aspirin reduces mortality from myocardial infarction. EMS 911 dispatchers sometimes instruct patients to take aspirin after an ambulance has been dispatched. Aspirin for cardiac chest pain is a standing medical order (SMO) for all EMS providers across the United States and Canada. Aspirin is also the standard of care for treating cardiac chest pain, once the patient reaches the emergency department. There is no evidence that taking aspirin at home provides any additional benefit over taking aspirin during paramedic transport or on arrival in the emergency department.
- **Telephone Triage and an EMS 911 Disposition**. Generally, these should be very short calls with the goal being to have the caller speak with the EMS 911 dispatcher as soon as possible. *The triager should deliver and the caller should hear one piece of information: CALL 911 NOW*. One can imagine a scenario in which the nurse triager spends too long on the phone with a caller clarifying allergies/whether or not they already took aspirin/explaining the difference between true aspirin and non-aspirin pain relievers (e.g., Tylenol).
- **If the Caller Asks about Aspirin.** Emphasize the importance of calling EMS 911 first. If there is no aspirin allergy, the patient may chew an aspirin (160 to 325 mg) while waiting for the paramedics to arrive.

Caution - Cardiac Ischemia

- Cardiac ischemia is the most common life-threatening cause of acute chest pain.
- Sometimes adults may present with chest pain as the sole symptom of a myocardial infarction. Often there will be other associated symptoms of cardiac ischemia: shortness of breath, nausea, and/or diaphoresis.
- Some adults can have cardiac ischemia without chest discomfort. For example, a diabetic with diaphoresis and shortness of breath.
- Women are less likely to experience chest pain and are more likely to have atypical symptoms; this can lead to delays in evaluation and treatment.
- Cardiac ischemia should be suspected in any patients with risk factors for cardiac disease. These include: hypertension, smoking, diabetes, hyperlipidemia, a strong family history of heart disease, and age > 50.

REFERENCES

1. 2012 Writing Committee Members, Jneid H, Anderson JL, Wright RS, et.al. American Heart Association. 2012 ACCF/AHA Focused Update of the Guideline for the Management of Patients With Unstable Angina/Non-ST-Elevation Myocardial Infarction. Circulation. 2012;126:875-910.

2. American Heart Association. 2005 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Part 8: Stabilization of the patient with acute coronary syndromes. Circulation. 2005;112:IV-89-IV-110.

3. Amsterdam EA, Kirk JD, Bluemke DA, Diercks D, et.al. Testing of Low-Risk Patients Presenting to the Emergency Department With Chest Pain: A Scientific Statement From the American Heart Association Circulation. 2010 Oct 26;122(17):1756-76.

4. Canto JG, Shlipak MG, Rogers WJ, et.al. Prevalence, clinical characteristics, and mortality among patients with myocardial infarction presenting without chest pain. JAMA. 2000;283(24):3223-3229.

5. Cooper LT Jr. Myocarditis. N Engl J Med. 2009 Apr 9;360(15):1526-38.

6. Edwards M, Chang AM, Matsuura AC, Green M, Robey JM, Hollander JE. Relationship between pain severity and outcomes in patients presenting with potential acute coronary syndromes. Ann Emerg Med. 2011 Dec;58(6):501-7.

7. Eisenberg MJ, Topal EJ. Prehospital administration of aspirin in patients with unstable angina and acute myocardial infarction. Arch Int Med. 1996;156(14):1506-1510.

8. Finkel JB, Marhefka GD. Rethinking cocaine-associated chest pain and acute coronary syndromes. Mayo Clin Proc. 2011 Dec;86(12):1198-207.

9. Gallus AS. Travel, venous thromboembolism, and thrombophilia. Semin Thromb Hemost. 2005 Feb;31(1):90-6.

10. Goldman L, Kirtane AJ. Triage of patients with acute chest pain and possible cardiac ischemia: the elusive search for diagnostic perfection. Ann Intern Med. 2003;139:987-995.

11. Goodacre S, et.al. How useful are clinical features in the diagnosis of acute undifferentiated chest pain? Acad Emerg Med. 2002;9(3):203-8.

12. Han JH, Lindsell CJ, Storrow AB, Luber S, Hoekstra JW, Hollander JE, Peacock WF 4th, Pollack CV, Gibler WB; EMCREG i*trACS Investigators. The role of cardiac risk factor burden in diagnosing acute coronary syndromes in the emergency department setting. Ann Emerg Med. 2007;49(2):145-52, 152.e1.

13. Jaffy MB, Meischke H, Eisenberg MS. Prevalence of aspirin use among patients calling 9-1-1 for chest pain. Acad Emerg Med. 1998;5(12):1146-9

14. Kessler CM. The link between cancer and venous thromboembolism: a review. Am J Clin Oncol. 2009 Aug;32(4 Suppl):S3-7.

15. Kline JA, Courtney DM, Kabrhel C, Moore CL, Smithline HA, Plewa MC, Richman PB, O'Neil BJ, Nordenholz K. Prospective multicenter evaluation of the pulmonary embolism rule-out criteria. J Thromb Haemost. 2008 May;6(5):772-80.

16. Lee TH, Goldman L. Evaluation of the patient with acute chest pain. N Engl J Med. 2000;342(16):1187-1195.

17. Markenson D, Ferguson JD, Chameides L, Cassan P, Chung KL, Epstein J, Gonzales L, Herrington RA, Pellegrino JL, Ratcliff N, Singer A. Part 17: First Aid - 2010 American Heart Association and American Red Cross Guidelines for First Aid. http://circ.ahajournals.org/content/122/18_suppl_3/S934.full.pdf+html

18. Marsan RJ, Shaver KJ, Sease KL, et.al. Evaluation of a clinical decision rule for young adult patients with chest pain. Acad Emerg Med. 2005; 12(1):26-31.

19. McConaghy JR, Oza RS. Outpatient diagnosis of acute chest pain in adults. Am Fam Physician. 2013 Feb 1;87(3):177-82.

20. McCord J, Jneid H, Hollander JE, et.al. Management of cocaine-associated chest pain and myocardial infarction: a scientific statement from the American Heart Association, et.al. Circulation. 2008 Apr 8;117(14):1897-907.

21. McRae S. Pulmonary embolism. Aust Fam Physician. 2010 Jun-Jul;39(6):462-6.

22. McSweeney JC, Cody M, O'Sullivan P, et.al. Women's early warning symptoms of acute myocardial infarction. Circulation. 2003;108:2619-2623.

23. Pope JH, et.al. Missed diagnosis of acute cardiac ischemia in the emergency department. N Engl J Med. 2000;342(16):163-1170.

24. Sayre MR, Koster RW, Botha M, Cave DM, et.al. Adult Basic Life Support Chapter Collaborators. Part 5: Adult basic life support: 2010 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. Circulation. 2010 Oct 19;122(16 Suppl 2):S298-324.

25. Swap CJ, Nagurney JT. Value and limitations of chest pain history in the evaluation of patients with suspected coronary syndromes. JAMA. 2005;294:2623-2629.

26. Weber JE, Chudnofsky, Boczcar, et.al. Cocaine associated chest pain: how common is myocardial infarction? Acad Emerg Med. 2000;7:873-877.

27. Welch RD, Zalenski RJ, Frederick PD, et.al. Prognostic value of a normal or nonspecific initial electrocardiogram in acute myoacardial infarction. JAMA. 2001;286:1977-1984.

28. Wilbur J, Shian B. Diagnosis of deep venous thrombosis and pulmonary embolism. Am Fam Physician. 2012 Nov 15;86(10):913-9.

AUTHOR AND COPYRIGHT

Author: David A. Thompson, MD, FACEP

Company: Schmitt-Thompson Clinical Content

Content Set: Office Hours Telephone Triage Protocols | Adult

Version Year: 2015

Last Revised: 8/10/2014

Last Reviewed: 1/18/2015