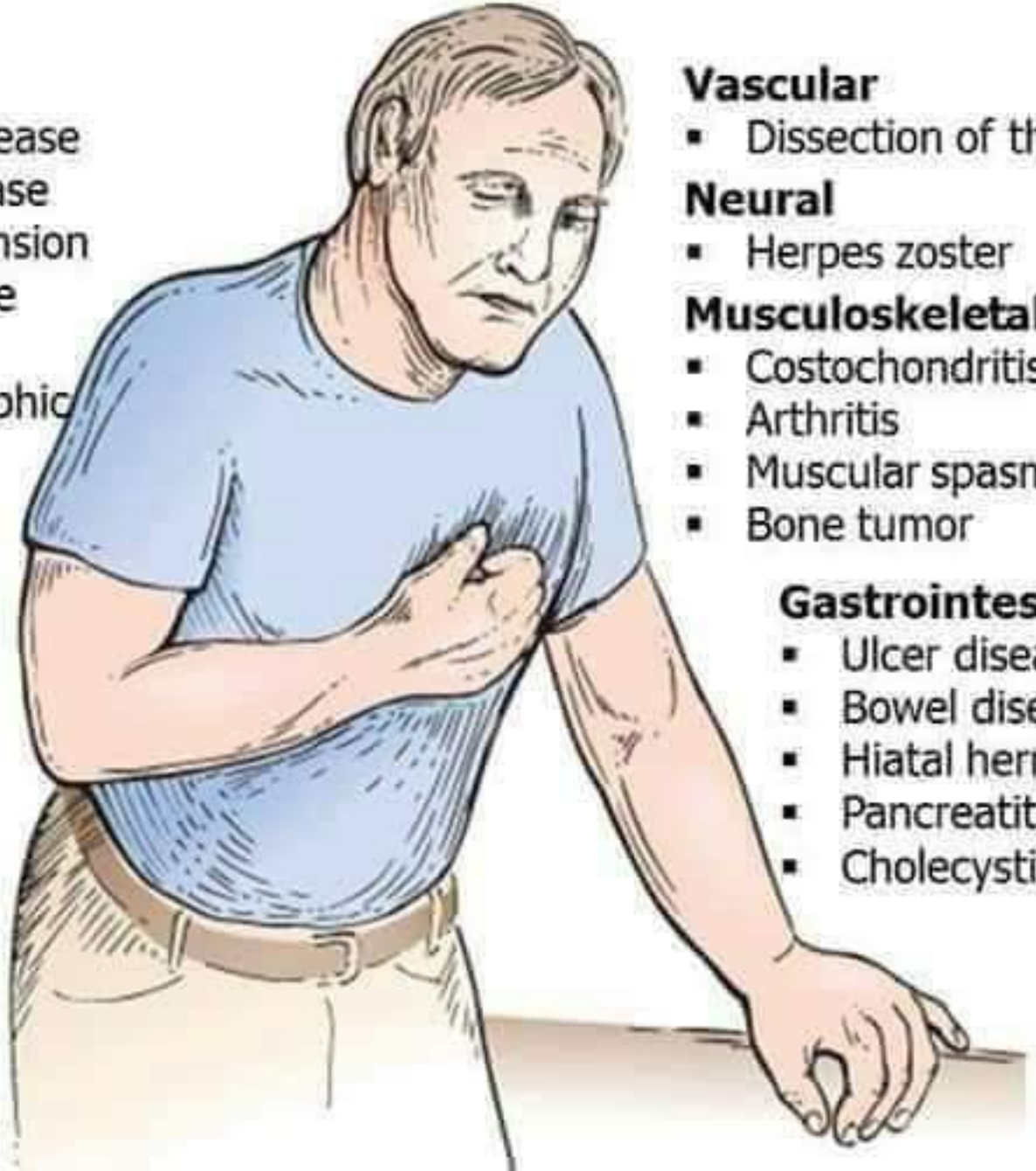

Chest Pain

# Common Causes of Chest Pain



**Cardiac**
- Coronary artery disease
- Aortic valvular disease
- Pulmonary hypertension
- Mitral valve prolapse
- Pericarditis
- Idiopathic hypertrophic subaortic stenosis

**Pulmonary**
- Pulmonary embolism
- Pneumonia
- Pleuritis
- Pneumothorax

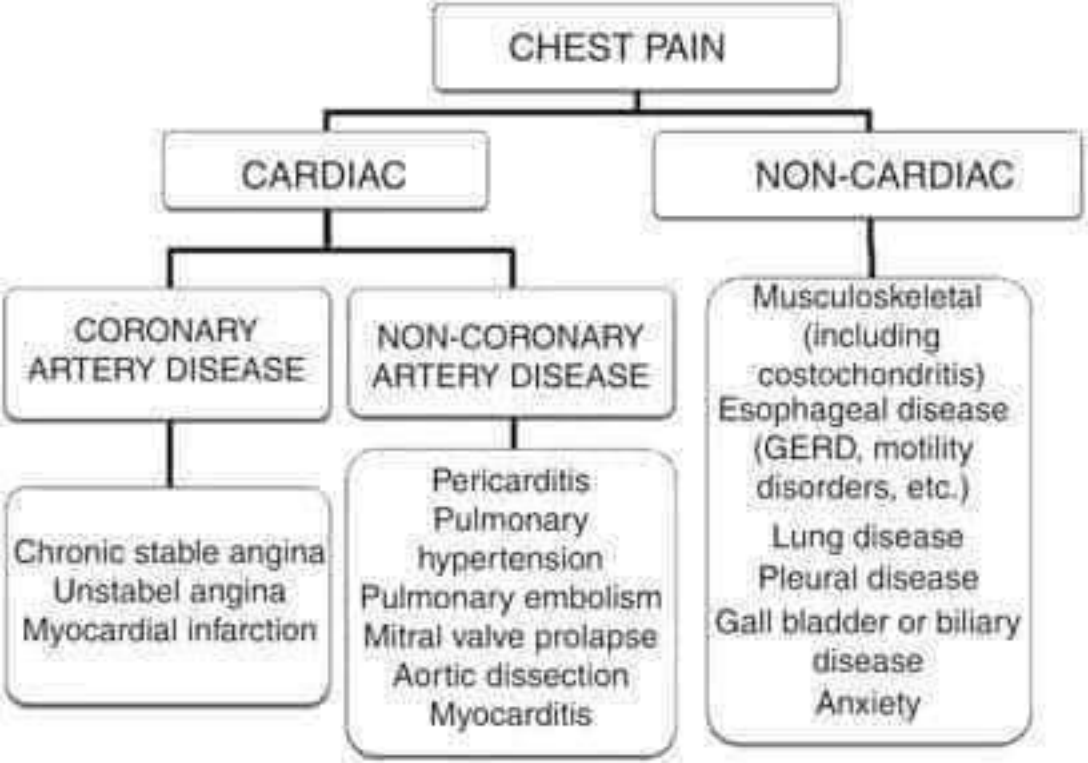
**Emotional**
- Anxiety
- Depression

**Vascular**
- Dissection of the aorta

**Neural**
- Herpes zoster

**Musculoskeletal**
- Costochondritis
- Arthritis
- Muscular spasm
- Bone tumor

**Gastrointestinal**
- Ulcer disease
- Bowel disease
- Hiatal hernia
- Pancreatitis
- Cholecystitis


CHEST PAIN
CARDIAC
NON-CARDIAC
CORONARY ARTERY DISEASE
NON-CORONARY ARTERY DISEASE
Musculoskeletal (including costochondritis)
Esophageal disease (GERD, motility disorders, etc.)
Lung disease
Pleural disease
Gall bladder or biliary disease
Anxiety
Chronic stable angina
Unstabel angina
Myocardial infarction
Pericarditis
Pulmonary hypertension
Pulmonary embolism
Mitral valve prolapse
Aortic dissection
Myocarditis

## DIFFERENTIAL DIAGNOSIS

### Cardiac

- Acute coronary syndrome (ACS)
- Aortic dissection
- Stable angina
- Pericarditis
- Aortic stenosis (AS)
- Myocarditis
- Arrhythmia

### Pulmonary

- Pulmonary embolism (PE)
- Pneumothorax (PTX)
- Pulmonary hypertension (PH)
- Pneumonia
- Pleuritis
- Lung cancer



### Gastrointestinal

- GERD
- Esophageal motility disorder
- Peptic ulcer
- Biliary disease
- Cholecystitis
- Mallory-Weiss tears
- Boerhave syndrome
- Pancreatitis
- Perihepatic/subdiaphragmatic abscess
- Esophagitis

# HISTORY: DIAGNOSIS-SPECIFIC PEARLS



- **ACS:** history of prior ACS, smoking, chest pain radiating to left arm, right arm, or the shoulder or both arms, nausea or vomiting, diaphoresis; atypical presentations in diabetics and women
- **Valvular disease:** effort syncope
- **Arrhythmia:** palpitations (especially felt in the neck), anxiety, light-headedness, chest pain, syncope, polyuria (2/2 ANP release)
- **Pericardial disease:** Chest pain ↑ w/ inspiration, ↓w/ sitting forward, radiates to trapezius (pericarditis), dyspnea, fatigue w/o chest pain (cardiac tamponade). History of malignancy, uremia, SLE, recent MI, thyroid disease, viral prodrome
- **Aortic dissection:** history of HTN, Marfan syndrome, bicuspid AV or history of AV replacement, sudden-onset "tearing" or "knife-like" chest or back pain
- **Anemia:** h/o bleeding, hemolysis, pica, dyspnea on exertion
- **Pneumonia:** older, immunocompromised
- **PE:** VTE risk factors (surgery, trauma, immobility, cancer, paresis, OCP/hormonal therapy),history of DVT/PE, hemoptysis
- **Pneumothorax/flail chest:** history of recent trauma, neck/chest wall procedures
- **Anxiety:** history of anxiety disorder

# PHYSICAL EXAM: GENERAL CONSIDERATIONS

- Assess respiratory and hemodynamic status—defer further evaluation until stabilized
- Acquire bilateral arm blood pressures
- Check and compare pulses in all four extremities
- Auscultate for reduced breath sounds, pleural rub, pericardial rub, murmur, gallop
- Evaluate for pain reproducible on palpation, as well as a focused skin examination

# PHYSICAL EXAM: DIAGNOSIS-SPECIFIC PEARLS

- ACS: Signs of heart failure: S3, SBP < 80, crackles; determine Killip Class.
- AS: late-peaking systolic crescendo murmur at LUSB, slow carotid pulse upstroke, ↓ S2
- Arrhythmia: heart rate (regular v irregular), "frog sign" (prominent JVP a-waves), signs of structural heart disease (murmur, etc.)
- Aortic dissection: pulse deficit/differential (R >L) (+LR 5.7), neurologic deficit (+LR 6.6–33), new diastolic murmur
- Anemia: pallor, tachycardia, orthostastic hypotension, systolic flow murmur
- Pericardial disease: 3 phase-friction rub at LLSB (pericarditis), pulsus paradoxus >10 mmHg
    - Beck's triad: distant heart sounds, JVD, ↓SBP (tamponade)

# References


1. Beers MH. The Merck Manual of Medical Information. Simon and Schuster; 2003.
2. Bope ET, Kellerman RD. Conn's Current Therapy 2015, Expert Consult - Online. Elsevier Health Sciences; 2014.
3. Isselbacher KJ. Harrison's principles of internal medicine, companion handbook. McGraw-Hill Companies; 1995.
4. Staff P, Reference PD. Physicians' Desk Reference 2014. PDR Network; 2013.

**Aortic dissection**:

- CXR: 90% have any abnormal findings, of note, 20% have normal aortic contours and are without a widened mediastinum
- CT chest w/ contrast if high suspicion

**Asthma/COPD**:

- CXR: hyperinflation
- Blood gas: hypercapnia
- Peak flow, spirometry

**Pneumonia**:

- CXR: new consolidation, effusion (though ~7% will have no initial CXR findings)
- CBC with differential, BMP, sputum/blood culture, *S. Pneumo/Legionella* urinary antigens

**PE**:

- D-dimer in low-probability (Wells < 2) patients
- Blood gas (hypoxia and hypocapnia)
- EKG (nonspecific; sinus tach, precordial T wave inversion, S1Q3/S1Q3T3, or RBBB are possible)
- CXR (nonspecific, elevated hemidiaphragm, unilateral effusion, atelectasis are possible)
- Doppler US lower extremities
    - Wells score < 2: D-dimer (-LR 0.22)
    - Wells score >2 or + D-dimer: spiral CT w/ contrast or VQ scan (if contrast contraindicated)

# WORK UP

**ACS**:

- EKG: ST elevation, new conduction defect, Q wave, ST depression, peaked or inverted T waves; check serially for dynamic ST-T wave changes
- Troponin I: test serially at presentation and q6h, will be detectable within 3–6h of myocardial injury
- Lipid profile, hemoglobin A1c
- Urine tox screen

**CHF:** echocardiogram, BNP, EKG

**Valvular disease:** echocardiogram

**Arrhythmia:** EKG, review telemetry

**Pericardial Disease**



- EKG diffuse STEs or TWIs (pericarditis), electrical alternans, ↓ voltages (effusion)
- Echocardiogram: presence, size of effusion and presence of tamponade physiology
- Troponin: often positive