

# RHYTHM INTERPRETATION

## CARDIAC ASSESSMENT

### Primary Care Paramedicine

Module: 12

Section: 06



- Calls involving cardiovascular complaints are among the most common you will deal with as a Paramedic.
- As a clinician you will be required to assess pathology of the cardiovascular system, recognize the potential for a life threatening condition and provide care until the patient is handed over to a higher level of care.

- As with any medical or trauma complaint, identify the most life threatening issues first:
  - Primary Survey
    - Airway
    - Breathing
    - Circulation
    - Order of steps differs depending on type of cardiac patient
      - Normally: ABC
      - Unresponsive or suspected cardiac arrest: CAB
  - Secondary Survey

- Cardiovascular disease may present with a variety of symptoms
- Common chief complaints include:
  - Chest pain or discomfort
    - including shoulder, arm, neck, or jaw pain or discomfort
  - Dyspnea
  - Syncope
  - Abnormal heart beat or palpitations

- Most common chief complaint of patients with myocardial infarction
- Many causes of chest pain or discomfort are unrelated to cardiac disease
  - Pulmonary embolus
  - Pleurisy
  - Reflux esophagitis
- A history of chest pain is important
  - Use the OPQRST method (or a similar method) to obtain information when possible

- Often associated with myocardial infarction
- Primary symptom of pulmonary congestion caused by heart failure
- Common causes of dyspnea that may be unrelated to heart disease include:
  - Chronic obstructive pulmonary disease
  - Respiratory infection
  - Pulmonary embolus
  - Asthma

- Historical factors important in differentiating breathing difficulties:
  - Duration and circumstances of onset of dyspnea
  - Anything that aggravates or relieves the dyspnea, including medications
  - Previous episodes
  - Associated symptoms
  - Orthopnea
  - Prior cardiac problems

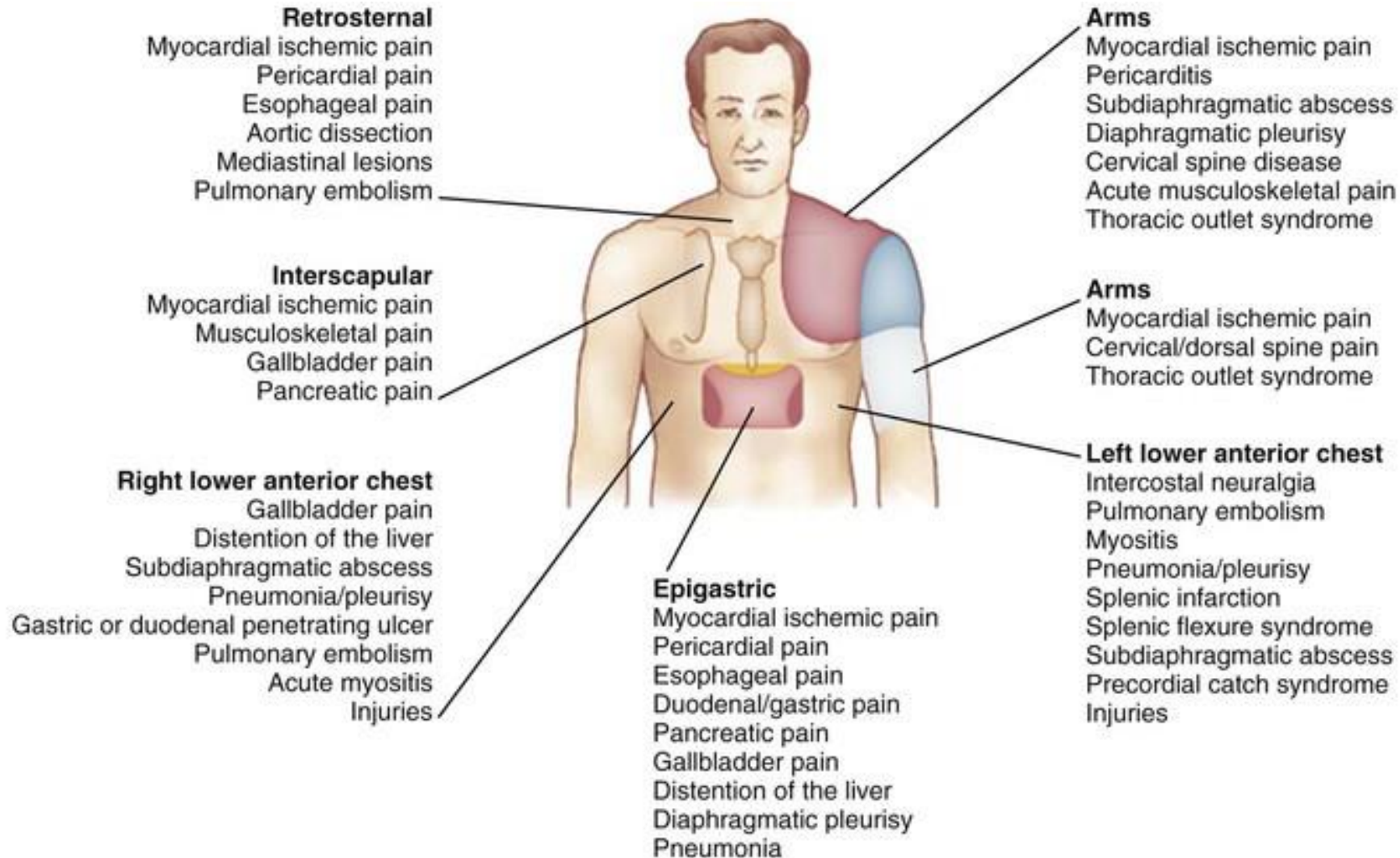
- Caused by a sudden decrease in cerebral perfusion
- Cardiac causes of syncope result from events that decrease cardiac output
  - The most common cardiac disorders associated with syncope are dysrhythmias
- Other causes of syncope in the medical patient include:
  - Stroke
  - Drug or alcohol intoxication
  - Aortic stenosis
  - Pulmonary embolism
  - Hypoglycemia



- Pre-syncope aura (nausea, weakness, lightheadedness)
- Circumstances of occurrence
  - Patient's position before the event
  - Severe pain
  - Emotional stress
- Duration of syncopal episode
- Symptoms before syncopal episode (palpitation, seizure, incontinence)
- Other associated symptoms
- Previous episodes of syncope

- Palpitations are sometimes a normal occurrence but may also indicate a serious dysrhythmia
- Important information to obtain includes:
  - Pulse rate (if obtained)
  - Regular versus irregular rhythm (if obtained)
  - Circumstances of occurrence
  - Duration
  - Associated symptoms (chest pain, diaphoresis, syncope, confusion, dyspnea)
  - Previous episodes, frequency
  - Medications (drug stimulant or alcohol use)

Cardiac	Musculoskeletal	Gastrointestinal
Presence of cardiac risk factors	History of trauma	History of indigestion
Specifically noted time of onset	Vague onset	Vague onset
Related to physical effort or emotional	Related to physical effort	Related to food consumption or psychosocial stress
Disappears if stimulating cause can be terminated	Continues after cessation of effort	May go on for several hours; unrelated to effort
Commonly forces patients to stop effort	Patients often can continue activity	Patients often can continue activity
Patient may awaken from sleep	Delays falling asleep	Patient may awaken from sleep, particularly during early morning
Relief at times with nitroglycerin	Relief at times with heat, nonsteroidal anti-inflammatory drugs, or rest	Relief at times with antacids
Pain often in early morning or after washing and eating	Worse in evening after a day of physical effort	No particular relationship to time of day; related to food, tension
Greater likelihood in cold weather	Greater likelihood in cold, damp weather	Anytime



- Chest pain or Discomfort
  - Onset and duration
  - Character
  - Location
  - Severity
  - Associated symptoms
  - Treatment
  - Medications

SAMPLE	OPQRST-ASPEN
<p>Signs and Symptoms</p> <p>Allergies</p> <p>Medications</p> <p>Past medical history</p> <p>Last oral intake</p> <p>Events preceding the incident</p>	<p>Onset</p> <p>Provokes or Palliates</p> <p>Quality</p> <p>Region, Radiation, Referral</p> <p>Severity</p> <p>Treatment</p> <p>Associated Symptoms</p> <p>Pertinent Negatives</p>

- Is the patient taking prescription medications, particularly cardiac medications?
- Is the patient being treated for any other illness?
- Has the patient ever had any of the following?
  - Myocardial infarction or episodes of angina pectoris
  - Coronary artery bypass procedure or angioplasty
  - Implanted pacemaker or ICD
  - Heart failure
  - Hypertension
  - Diabetes
  - Chronic lung disease

- Does the patient have any allergies?
- Are there any other associated risk factors for a cardiac event?
- Does the patient have an implanted pacemaker or implantable cardioverter-defibrillator (ICD)?



- Cardiac surgery and hospitalization
- Valvular disease
- Aneurysm
- Rhythm disorder
- Acute rheumatic fever, unexplained fever, swollen joints, inflammatory rheumatism
- Pulmonary disease
- Congenital heart disease
- Diabetes
- Renal disease
- Hypertension
- Peripheral vascular disease
- Kawasaki disease

- Long QT syndrome
- Marfan syndrome
- Diabetes
- Heart disease
- Dyslipidemia
- Hypertension
- Congenital heart defects
- Family members with cardiac risk factors

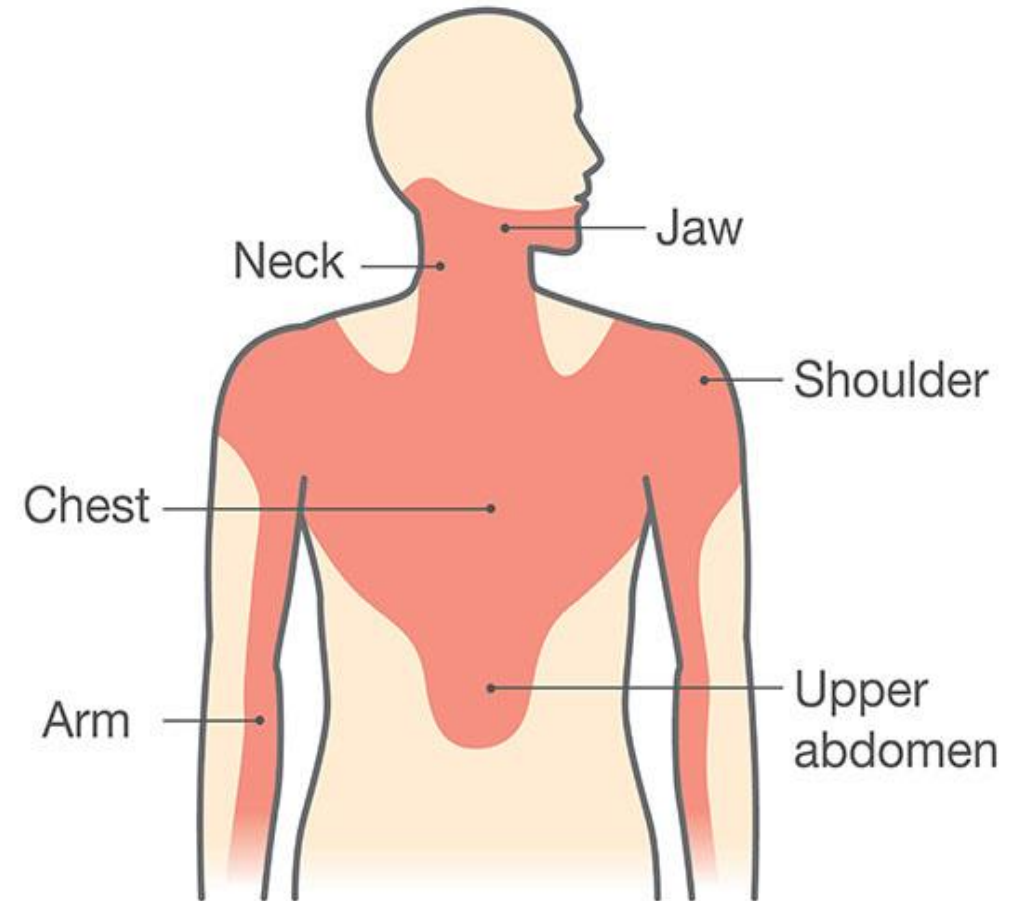
- Employment
  - Physical demands
  - Environmental hazards
- Tobacco use
- Nutritional status
- Usual diet
- Weight

- Alcohol consumption
- Known hypercholesterolemia/triglycerides
- Relaxation/hobbies
- Exercise
- Illicit drug use

- The “classic presentation” of AMI is pain or discomfort beneath the sternum that lasts more than 30 minutes
- Associated signs and symptoms:
  - Apprehension
  - Diaphoresis
  - Dyspnea
  - Nausea and vomiting
  - Sense of impending doom
- Presentation may also be atypical
- A thorough medical history and physical examination is important

- Altered level of consciousness
- Restless or anxiety
- Headache
- Signs of trauma
- Fatigue
- Limited activity
- Facial grimace or other indications of pain

- The discomfort of cardiac chest pain often radiates to other regions of the body



- The examination of the heart includes the following:
  - Inspecting
  - Palpating
  - Percussing the chest
  - Auscultating the heart
- In assessing cardiac function, it is a common error to listen to the heart first
  - It is important to follow the proper sequence



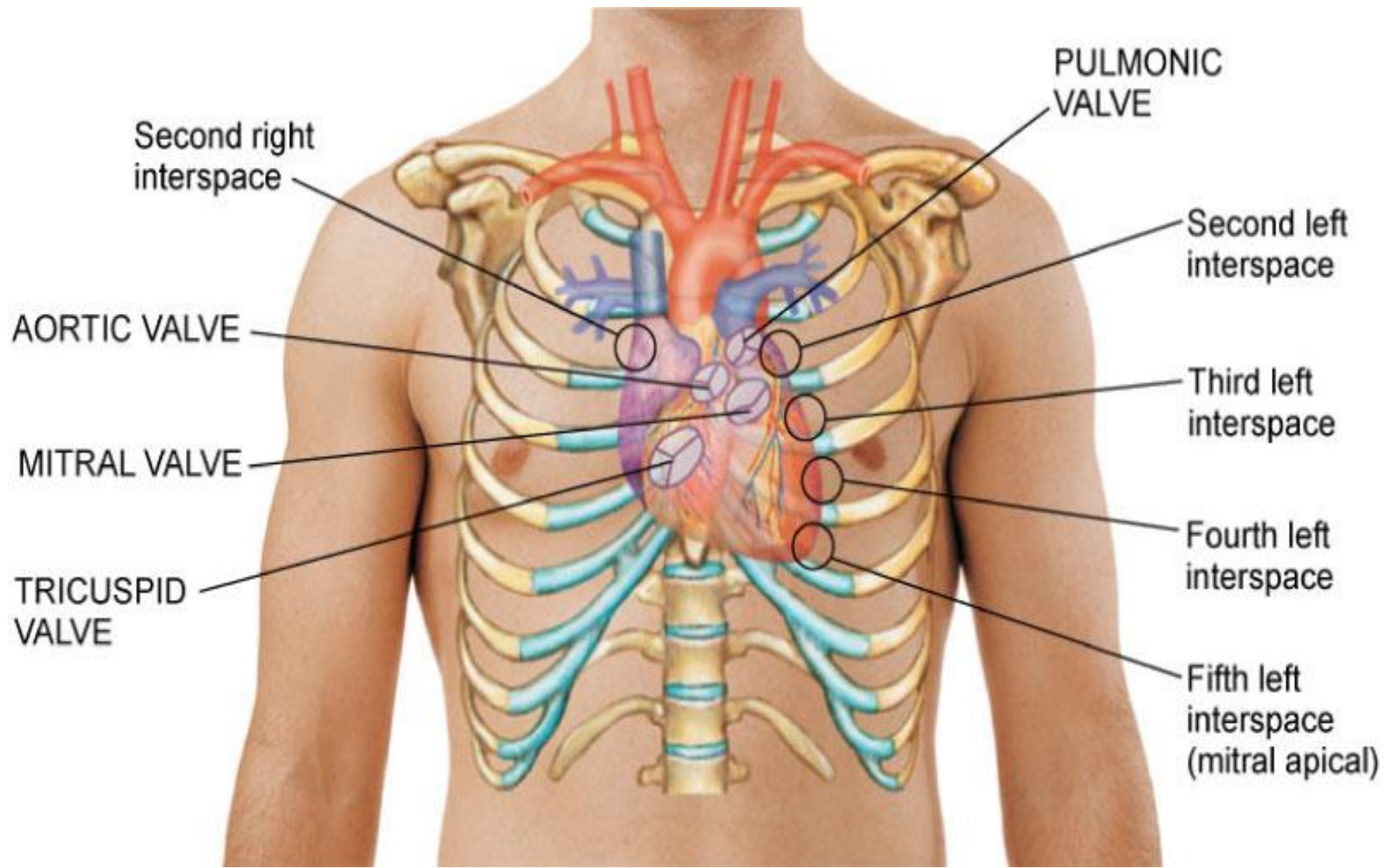
- The secondary assessment for cardiac conditions follows a systematic approach focusing on:
  - Inspection
  - Auscultation
  - Palpation approach

- Skin color, capillary refill, skin moisture
  - Indications of adequate hemoglobin oxygenation (pulse oximetry)
  - Indications of cardiac function (peripheral perfusion)
- Jugular vein distention (JVD)
  - Should be evaluated with the patient's head elevated at 45 degrees
  - May be difficult to assess in obese patients

- Peripheral and presacral edema
  - Caused by chronic back-pressure in systemic venous circulation
  - Most obvious in dependent areas (ankles and sacral region in bedridden patients)
  - May be:
    - Nonpitting - minimal or no depression of tissue after removal of finger pressure
    - Pitting - depression of tissue remains after removal of finger pressure

- Additional indicators of cardiac disease
  - Nitroglycerin patch
  - Midsternal scar from coronary surgery
  - Implanted pacemaker or automatic implantable cardioverter-defibrillator (left upper chest; abdominal wall)
  - Medic alert information

- Lung sounds
  - Assess for equality
  - Assess for adventitious sounds that may indicate pulmonary congestion or edema
- Heart sounds



- Assess overall rate and rhythm
  - Frequency
  - Intensity
  - Duration
  - Pathology

- May be auscultated for:
  - Frequency (pitch)
  - Intensity (loudness)
  - Duration
  - Timing in the cardiac cycle



- Aortic
    - Second intercostal space to the right of the sternum
  - Pulmonic
    - Second intercostal space to the left of the sternum
- And
- Third left intercostal space at the left sternal border

- Tricuspid
  - Fifth left intercostal space close to the sternal border
- Mitral
  - Fifth intercostal space just medial to the left midclavicular line
  - Directly over the left ventricle
  - Sometimes called the apical area or apex

- The lub of the lub-dub sound produced by the heart
- Occurs as the mitral and tricuspid valves close
- Marks the beginning of ventricular systole
- Best heard with the diaphragm of the stethoscope at the apex of the heart (fifth intercostal space)

- The dub of the lub-dub sound
- Occurs as the aortic and pulmonic valves close
- Marks the end of ventricular systole
- Best heard with the diaphragm of the stethoscope at the second intercostal space to the right and left of the sternum (aortic and pulmonic areas)

- An extra heart sound associated with rapid ventricular filling
- Common in children, athletes, and young adults
- The presence of a third heart sound is considered abnormal in persons over age 30
- Best heard at the apex with the bell of the stethoscope
- Sounds like Ken-Tuck-Y with the emphasis on Tuck
  - Ken = S1, Tuck = S2, Y = S3
- May be a warning sign of impending congestive heart failure

- Thought to be due to the last of ventricular filling, tensing of the atrioventricular valves, and atrial contraction
- Heard just before S1
- Best heard at the apex with the bell of the stethoscope
- Sounds like Ten-nes-see with the emphasis on Ten
  - Ten = S4, Nes = S1, See = S2

- Peripheral or presacral edema
- Pulse
  - Rate
  - Regularity
  - Equality
  - Pulse deficit
  - Pulsus paradoxus
  - Pulsus alternans

- Apical impulse
  - Visible and palpable force produced by the contraction of the left ventricle
- Pulse deficits can be noted by palpating or auscultating the apical impulse and the carotid pulse simultaneously



- Skin
  - Diaphoretic pale skin is an indicator of peripheral vasoconstriction and sympathetic stimulation
  - Cyanosis is an indicator of poor oxygenation
  - Fever is usually an indicator of infection

- Slow down pace of examination
  - Positions that may be uncomfortable or perhaps too difficult
  - May not be able to lie flat for an extended time
  - May not be able to control their breathing pattern at your request
  - An abrupt position change may cause a transient lightheadedness because of a drop in arterial pressure

- Common symptoms of cardiovascular disorder
  - Confusion and syncope
  - Palpitations
  - Coughs and wheezes
  - Hemoptysis
  - Shortness of breath
  - Chest pain and tightness
  - Incontinence, impotence, and heat intolerance
  - Fatigue
  - Leg edema

- Previous diagnosis of heart disease
- Drug reactions
- Potassium depletion
- Digitalis toxicity
- Interference with activities of daily living
- Ability of the patient and family to cope with the condition
- Orthostatic hypotension

- You respond to a house for Mr. Jones, a 68-year-old white male. He is concerned about intermittent chest pain. He is not currently having pain. You begin to take a careful history.
- Which of the following elements of the history of present illness would you find most concerning regarding a cardiac origin of the pain?
  - Pain is related to physical activity
  - Pain is precipitated by breathing or coughing
  - Pain occasionally delays his ability to fall asleep

- You further question Mr. Jones regarding the pain's onset and duration, character, location, severity, and \_\_\_\_\_ symptoms.

- By asking about associated symptoms you find out that Mr. Jones experiences shortness of breath as well as diaphoresis during the pain episodes. He also states that last week he slipped and struck his chest against the refrigerator. You are now convinced that Mr. Jones is experiencing cardiac chest pain.
- The history of a chest wall injury is most likely an example of:
  - Occam's razor
  - A red herring

- You begin your physical exam of Mr. Jones with the knowledge that in cases of angina pectoris the physical exam may \_\_\_\_\_:
  - Confirm your diagnosis of angina pectoris
  - Point you to another source of the pain
  - Be normal



- Mr. Jones was ultimately admitted to the hospital where he underwent further evaluation and management of his angina pectoris.

- Cardiovascular disease is one of the leading causes of death in Canada with many deaths occurring within the first 24 hours.
- Your assessment and recognition of life threatening presentations is the start of the healing process.