I KATEDRA i KLINIKA KARDIOLOGII
WARSZAWSKIEGO UNIWERSYTETU MEDYCZNEGO

SIGNS AND SYMPTOMS OF CARDIOVASCULAR DISEASES

Ewa Szczerba

SYMPTOM

any morbid phenomenon

(a symptom in relation to disease) or departure from the normal in structure, function, or sensation, **experienced by the patient** and indicative of disease

STEDMAN'S Medical dictionary 26th Edition

SIGN

any abnormality indicative of disease, **discoverable on examination** of the patient; an **objective** symptom of disease, in contrast to a symptom which is subjective

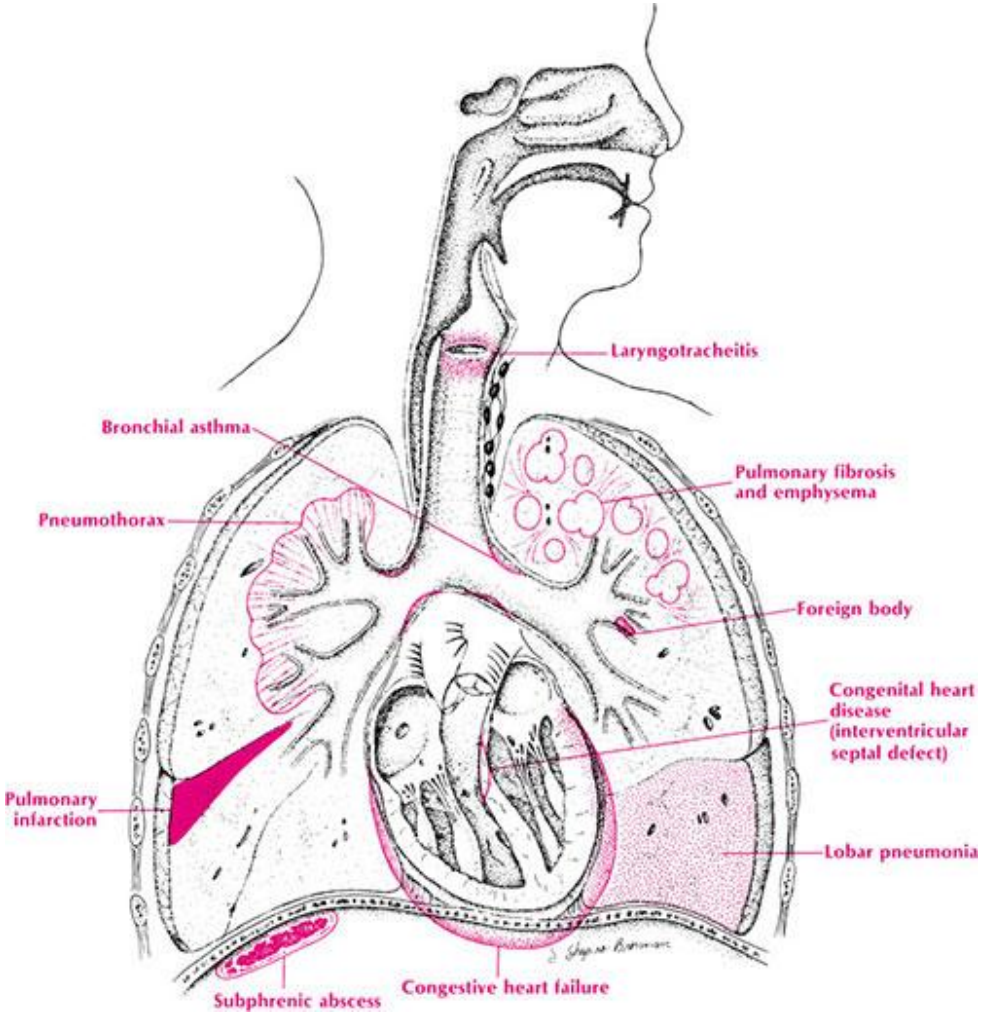
STEDMAN'S Medical dictionary 26 th Edition

Cardinal symptoms of heart disease

- Dyspnea
- Chest pain or discomfort
- Cyanosis
- Syncope
- Palpitations
- Oedema
- Hemoptysis
- Cough

Braunwald – *Heart disease* 6th edition

Dyspnea



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DYSPNEA

- Pulmonary congestion
- Reduced cardiac output

Acute / Chronic
At rest / on exertion
Exacerbating / relieving factors
Body position – ortopnoe?
Accompanied by other symptoms?

Dyspnea

Physical examination:

- Evidence of airways obstruction?
- Hyperinflation?
- Assess air movement and quality of breath sounds
- Signs of volume overload?
- Evidence of DVT?
- Edema?

Additional exams:

- BNP/NT-pro-BNP
- Arterial blood gases
- Chest X-rays
- ECHO?
- CT scan?

Chest pain

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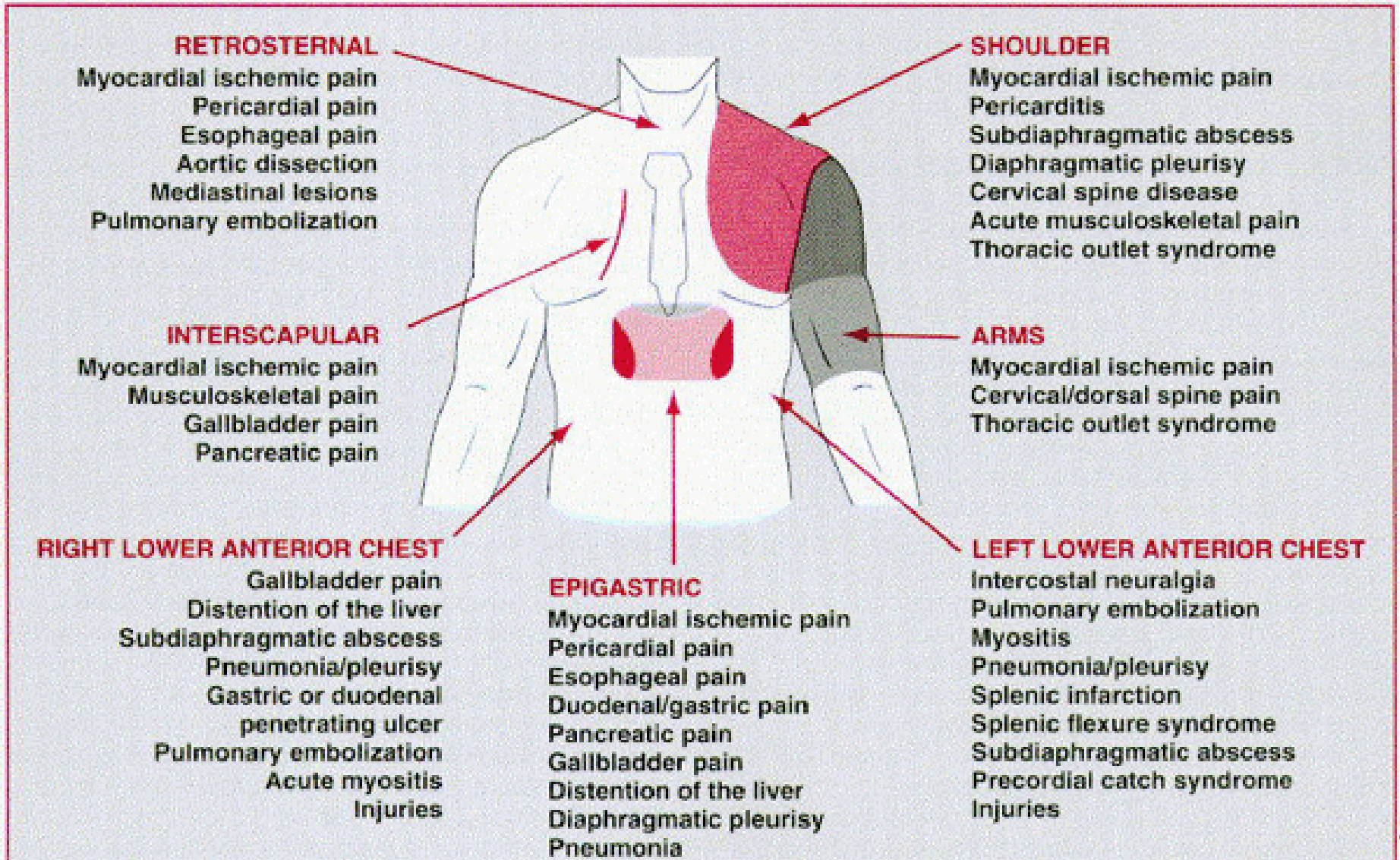
Chest Pain

- **<u>History is very important</u>**
- Points to note in the history
  - location
  - radiation
  - character
  - aggravating factors
  - relieving factors
  - time relationships
    - duration, frequency and pattern of occurrence
  - setting in which it occurs
  - associated factors

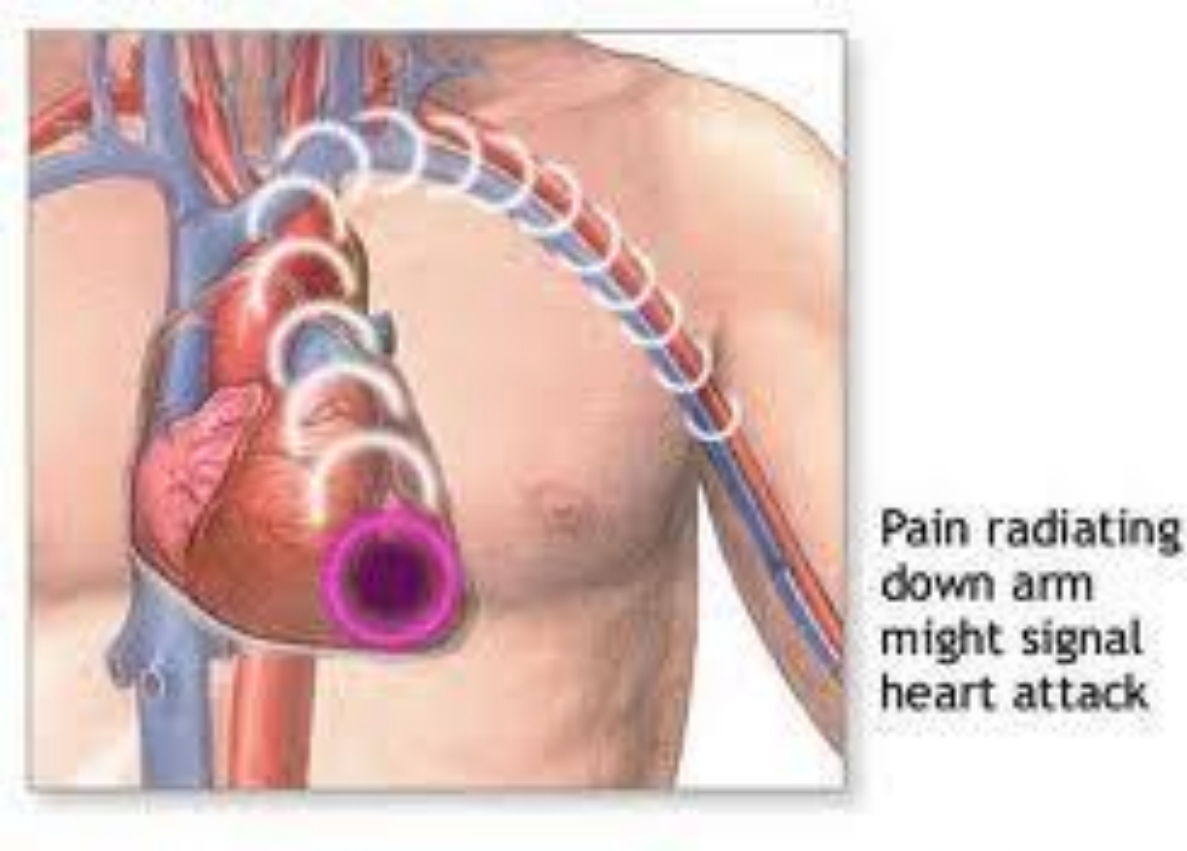
Chest Pain or Discomfort

- although a cardinal manifestation of heart disease, also originates from
  - Non-cardiac intrathoracic structures
    - aorta, pulmonary artery, bronchopulmonary tree, pleura, mediastinum, oesophagus and diaphragm
  - tissues of the neck and thoracic wall
    - skin, thoracic muscles, cervicodorsal spine, costochondral junctions, breasts, sensory nerves and spinal cord
  - subdiaphragmatic organs
    - stomach, duodenum, pancreas and gallbladder

Differential diagnosis of chest pain according to location



Chest pain



ADAM

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TABLE 48-2 -- CAUSES OF CHEST PAIN

Condition	Location	Quality	Duration	Aggravating or Relieving Factors	Associated Symptoms or Signs
CARDIOVASCULAR CAUSES					
Angina	Retrosternal region; radiates to or occasionally isolated to neck, jaw, epigastrium, shoulder, or arms (left common)	Pressure, burning, squeezing, heaviness, indigestion	<2–10 min	Precipitated by exercise, cold weather, or emotional stress; relieved by rest or nitroglycerin; atypical (Prinzmetal's) angina may be unrelated to activity, often early morning	S_3 or murmur of papillary muscle dysfunction during pain
Rest or unstable angina	Same as angina	Same as angina but may be more severe	Usually <20 min	Same as angina, with decreasing tolerance for exertion or at rest	Similar to stable angina, but may be pronounced; transient heart failure can occur
Myocardial infarction	Substernal and may radiate like angina	Heaviness, pressure, burning, constriction	≥30 min but variable	Unrelieved by rest or nitroglycerin	Shortness of breath, sweating, weakness, nausea, vomiting
Pericarditis	Usually begins over sternum or toward cardiac apex and may radiate to neck or left shoulder; often more localized than the pain of myocardial ischemia	Sharp, stabbing, knifelike	Lasts many hours to days; may wax and wane	Aggravated by deep breathing, rotating chest, or supine position; relieved by sitting up and leaning forward	Pericardial friction rub
Aortic dissection	Anterior chest; may radiate to back	Excruciating, tearing, knifelike	Sudden onset, unrelenting	Usually occurs in setting of hypertension or predisposition, such as Marfan syndrome	Murmur of aortic insufficiency, pulse or blood pressure asymmetry; neurologic deficit

Chest pain

Pulmonary embolism (chest pain often not present)	Substernal or over region of pulmonary infarction	Pleuritic (with pulmonary infarction) or angina-like	Sudden onset; minutes to <1 hr	May be aggravated by breathing	Dyspnea, tachypnea, tachycardia; hypotension, signs of acute right ventricular failure, and pulmonary hypertension with large emboli; rales, pleural rub, hemoptysis with pulmonary infarction
Pulmonary hypertension	Substernal	Pressure; oppressive	Similar to angina	Aggravated by effort	Pain usually associated with dyspnea; signs of pulmonary hypertension

Chest pain

NONCARDIAC CAUSES					
Pneumonia with pleurisy	Localized over involved area	Pleuritic, localized	Brief or prolonged	Painful breathing	Dyspnea, cough, fever, dull to percussion, bronchial breath sounds, rales, occasional pleural rub
Spontaneous pneumothorax	Unilateral	Sharp, well localized	Sudden onset, lasts many hours	Painful breathing	Dyspnea; hyperresonance and decreased breath and voice sounds over involved lung
Musculoskeletal disorders	Variable	Aching	Short or long duration	Aggravated by movement; history of muscle exertion or injury	Tender to pressure or movement
Herpes zoster	Dermatomal in distribution	Burning, itching	Prolonged	None	Vesicular rash appears in area of discomfort
Esophageal reflux	Substernal, epigastric	Burning, visceral discomfort	10–60 min	Aggravated by large meal, postprandial recumbency; relief with antacid	Water brash
Peptic ulcer	Epigastric, substernal	Visceral burning, aching	Prolonged	Relief with food, antacid	
Gallbladder disease	Epigastric, right upper quadrant	Visceral	Prolonged	May be unprovoked or follow meals	Right upper quadrant tenderness may be present
Anxiety states	Often localized over precordium	Variable; location often moves from place to place	Varies; often fleeting	Situational	Sighing respirations, often chest wall tenderness

Cyanosis

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Cyanosis

- Both: a symptom and a physical sign
- Results from an increased quantity of reduced hemoglobin

Central cyanosis-decreased arterial oxygen saturation due to right-to-left shunting of blood or impared pulmonary function

Peripheral cyanosis – secondary to cutaneus vasoconstriction due to low cardiac output or exposure to cold air

Cyanosis

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Cyanosis

- **Hypoxia**
- Congenital heart disease with right-to-left shunt
- Pulmonary embolism
- Pulmonary edema
- Pulmonary disease (oxygen diffusion and alveolar ventilation abnormalities)
- Hemoglobinopathies
- Decreased cardiac output
- Vasospasm
- Arterial obstruction
- Pulmonary arteriovenous fistulas
- Elevated hemidiaphragm
- Neoplasm (bronchogenic carcinoma, mediastinal neoplasm, intrahepatic lesion)

Syncope

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Syncope

- Loss of consciousness resulting most commonly from reduced perfusion of the brain.
- Cardiac syncope:
  - Rapid onset without aura, convulsive movements, urinary incontinence
  - Consciousness regained promptly

Tachyarythmias, bradyarythmias, orthostatic hypotension, vasodepressor syncope, aortic stenosis...

Palpitation

Patient's description: pounding, jumping, racing, or irregularity of the heart beat

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Palpitations

- Unpleasant awareness of the forceful or rapid beating of the heart

Tachycardia, atrial fibrilation, ectopic beats, augmented stroke volume due to valvular regurgitation, sudden onset of bradycardia...

Palpitations

- associated with drug use
  - tobacco, coffee, tea, alcohol epinephrine, aminophylline, MAOI
- on standing
  - postural hypotension
- middle aged women, associated flushes and sweats
  - menopausal syndrome
- associated with normal rate and rhythm
  - anxiety state

Oedema

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Oedema

- Both lower extremities (symetrical).
- Most pronounced in the evening.
- Preceded by a weight gain of 3-5kg
- Accompanying symptoms: dyspnea, pulmonary congestion.
- REMEMBER: In recumbent patients oedema of cardiac origin is present in the back, abdomen, sacrum area

Oedema

- Causes of peripheral oedema
  - Cardiac failure
  - Chronic venous insufficiency
  - Hypoalbuminaemia – nephrotic syndrome, liver disease, protein losing enteropathy
  - Drugs
    - retaining sodium (fludrocortisone, NSAID)
    - increasing capillary permeability (nifedipine)

Pitting oedema

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Pitting oedema

A B

Cough

- Defined as an explosive expiration that provides a means of clearing the tracheobronchial tree of secretions and foreign bodies

pulmonary venous hypertension, pulmonary edema or infarction, compresion of the tracheobronchial tree (aortic aneurysm)

Cough

- **the nature of the sputum is often helpful**
  - *pink frothy sputum* - pulmonary oedema
  - *clear white mucoid sputum* –viral infection or longstanding bronchial irritation
  - *thick, yellowish sputum* – infection
  - *rusty sputum* – pneumococcal pneumonia
  - *blood streaked sputum* – tuberculosis, bronchiectasis, Ca lung or pulmonary infarction

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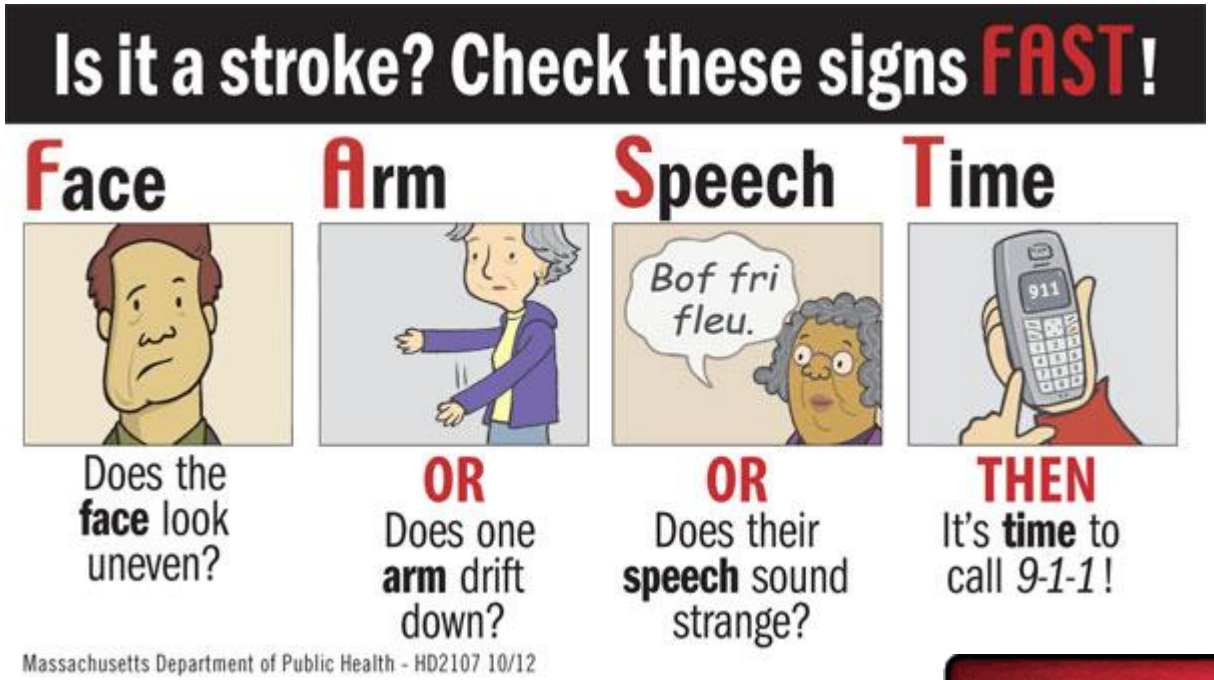
Hemoptysis

- The expectoration of blood or of sputum, either streaked or grossly contaminated with blood

pulmonary edema, pulmonary embolism, mitral stenosis, pulmonary infarction, TBC, carcinoma of the lung.

Neurological symphtoms



Other symptoms

- Fatigue
- Nocturia
- Anorexia, cachexia, weight loss
- Hoarseness – compression of the recurrent laryngeal nerve (aortic anerysm, enlarged left atrium)

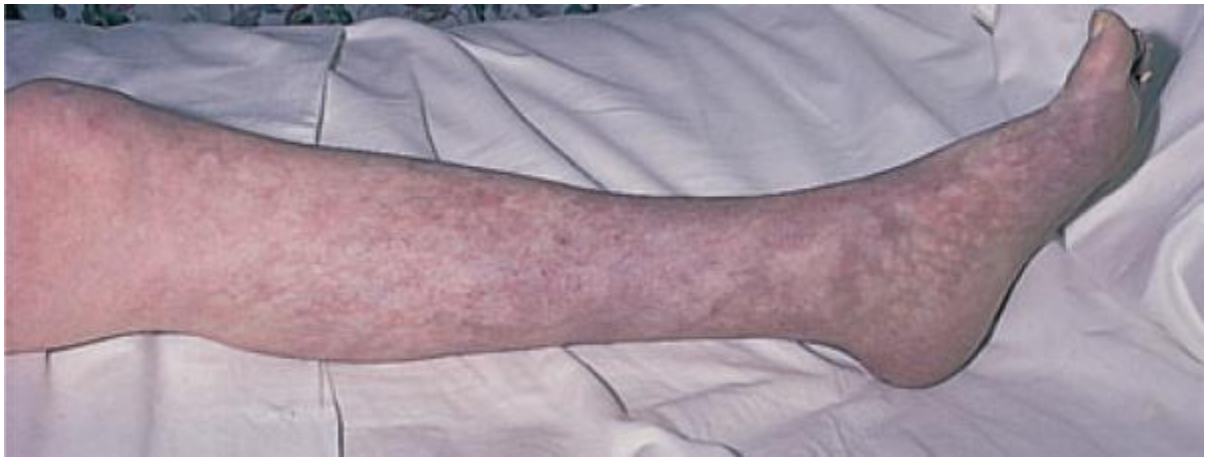
Fatigue

- non-specific
- common in patients with impaired cardiovascular function
- consequent to a reduced cardiac output
- associated with muscular weakness
- may be caused by drugs e.g. β-blockers
- may also result for excessive blood pressure reduction in patients with hypertension or heart failure
- caused by excessive diuresis or diuretic induced hypokalaemia

SIGNS – General appearance

- Position: sitting, supine, leaning forward?
- Skin – color, moist/dry?
- Oedema?
- Cyanosis – peripheral, central? Clubbing of the fingers and toes?
- Features of hyperlipidemia (corneal arcus, xanthelasma)
- Overweight? Fat tissue distribution?
- Features of genetic disorders, Marfan's syndrome

Cyanosis of the leg



Finger clubbing

Finger clubbing

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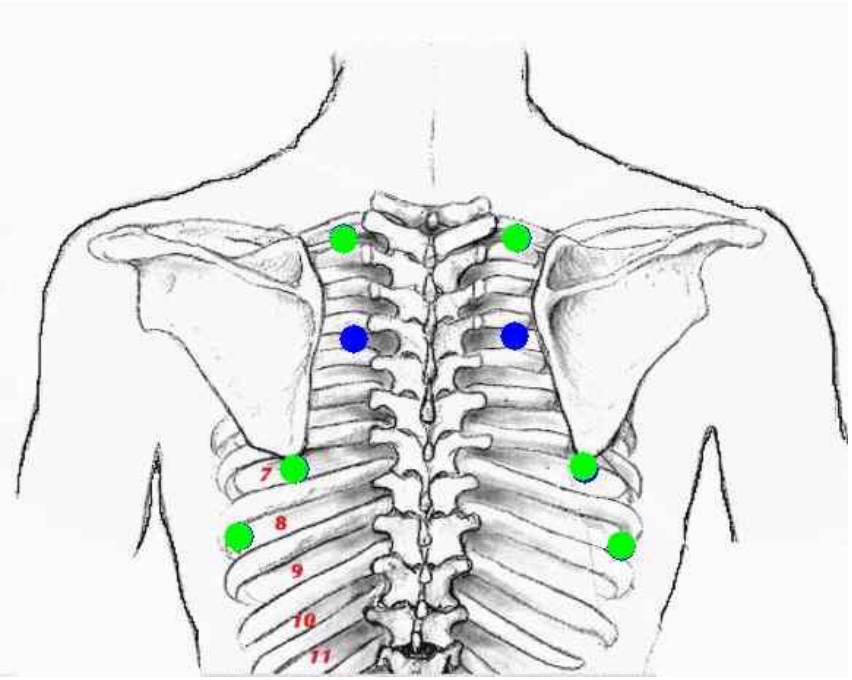
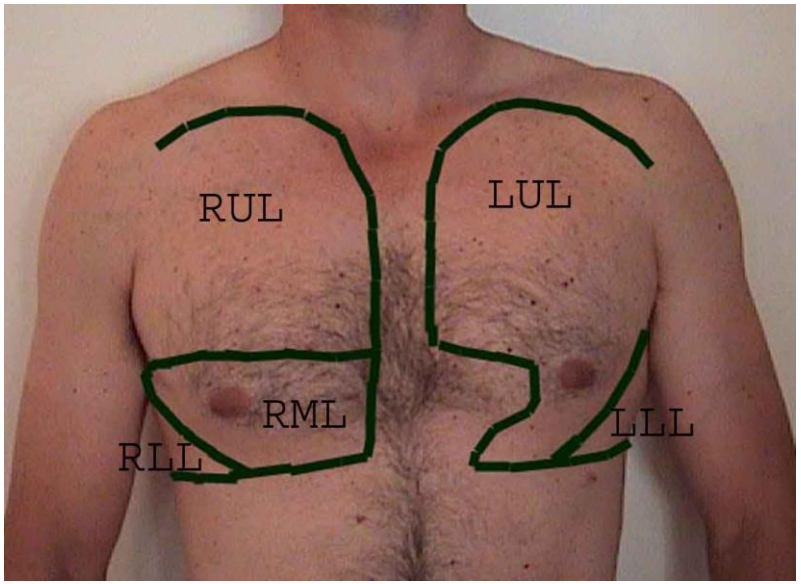
SIGNS

- Breathing
  - Number of breaths (tachypnoe?)
  - Diviation of trachea?
  - Symetrical/asymetrical movement of the chest
  - Duration of expiration/inspiration
  - Additional sounds - stridor?

Thorax ausculation





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Breath sounds

Crackles:

- Explosive, sharp, discrete bursts of interrupted sound.
- Their pattern is remarkably constant and cannot be destroyed by coughing.
- Crackles are divided into two types depending on their acoustic properties.

Wheezes:

- continuous, high-pitched sound heard throughout respiration

Rhonchi:

- Low-pitched sounds
- Frequently disappear following a cough

Pleural rub:

- the sound produced by the motion of inflamed pleurae
- the two thickened surfaces produce vibrations as they move irregularly over each other.

Crackles

Fine Crackles

sounds like the crackling noise made when salt is heated on a frying pan.

On auscultation fine crackles are in general higher pitched, less intense and of shorter duration than coarse crackles.

The **probable mechanism** for the production of fine crackles is as follows. During inspiration, the air pressure on the "upstream" (mouth) side increases until it is able to overcome the forces that are closing the bronchiole. When this occurs, the airway snaps open as the pressure between the bronchiole and the alveolus is equalized . The resulting vibration in the airway causes a discrete, sharp sound of very short duration.

Fine crackles are usually appreciated only during inspiration.

Coarse Crackles

sound of water being poured from a bottle.

coarse crackles are in general lower pitched, less intense and of longer duration than fine crackles.

The bubbling sound of coarse crackles is produced when air passes over secretions in the larger airways (trachea and bronchi).

Since air flows through the airways duringinspiration and expiration, **coarse crackles are more likely to be detected during both phases of the respiratory cycle.**

The most common conditions associated withcoarse crackles are congestive heart failure and pneumonia,Bronchiectasis.

SIGNS

- Palpation of the pulse
  - On which vessels? In what clinical settings?
  - Asculatation?
  - Pulse deficit
  - Regularity?
  - Tachycardia/bradycardia

SIGNS

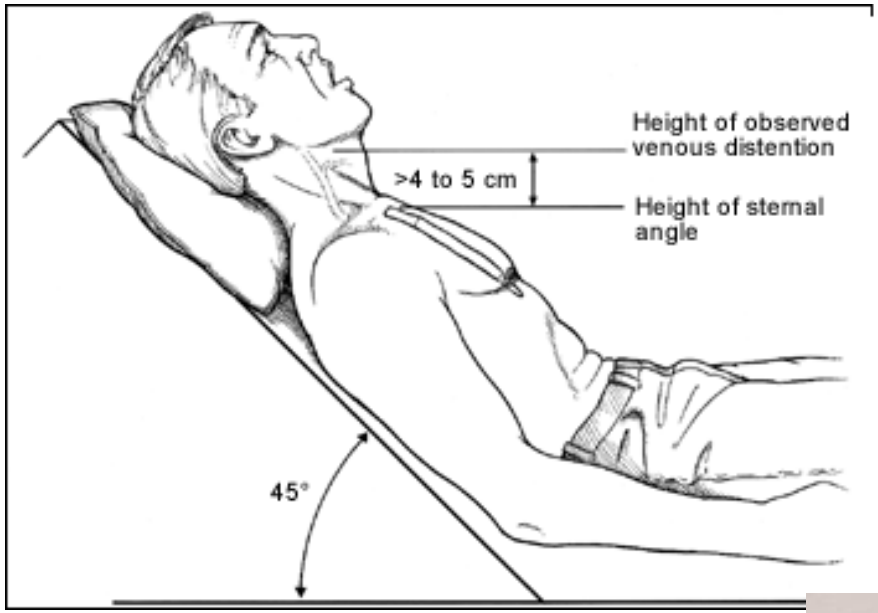
- Upper and lower extremities
  - Skin color
  - Ulcerations/rash
  - Odema
  - Varices
  - Skin above pacemaker/ICD

SIGNS

- Abdomen:
  - Pathological murmurs, pulsations
  - Ascites
  - Hepatomegaly, splenomegaly
  - Hepato-jugular reflux

Typical distention of the internal jugular vein

Hepatojugular reflux



Examination of the praecordium and chest

- Look:
  - wounds, skin abnormalities, bone abnormalities, apex beat
- Palpate:
  - pain?
  - Praecordial thrill

Heart auscultation

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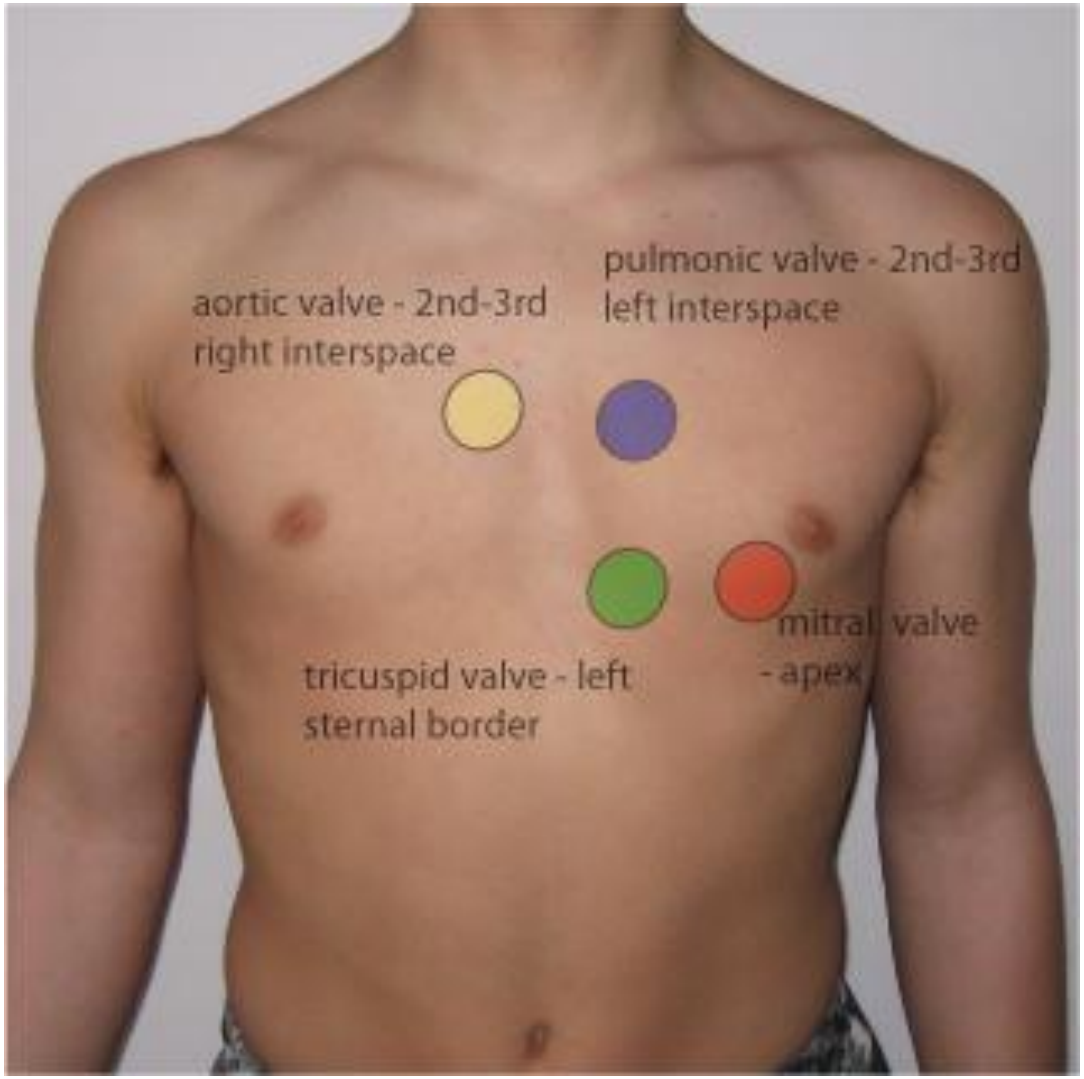
Heart auscultation



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Heart sounds

- First heart sound is produced by the closing of the mitral and tricuspid valve
- Second heart sound is produced by the closing of aortic and pulmonic valve leaflets

Heart sounds

- Third heart sound is created by a sudden and rapid blood inflow to the ventricle in diastole (increased rate or volume of ventricular filling).
  - Impairment of ventricle function
  - AVR
- Forth heart sound is created by the systole of the artia and is connected with an increased pressure in the atria. Occures when diminished ventricular compliance increases the resistance to ventricular filling:
  - Systemic hypertension
  - Aortic stenosis
  - Hypertrophic cardiomyopathy

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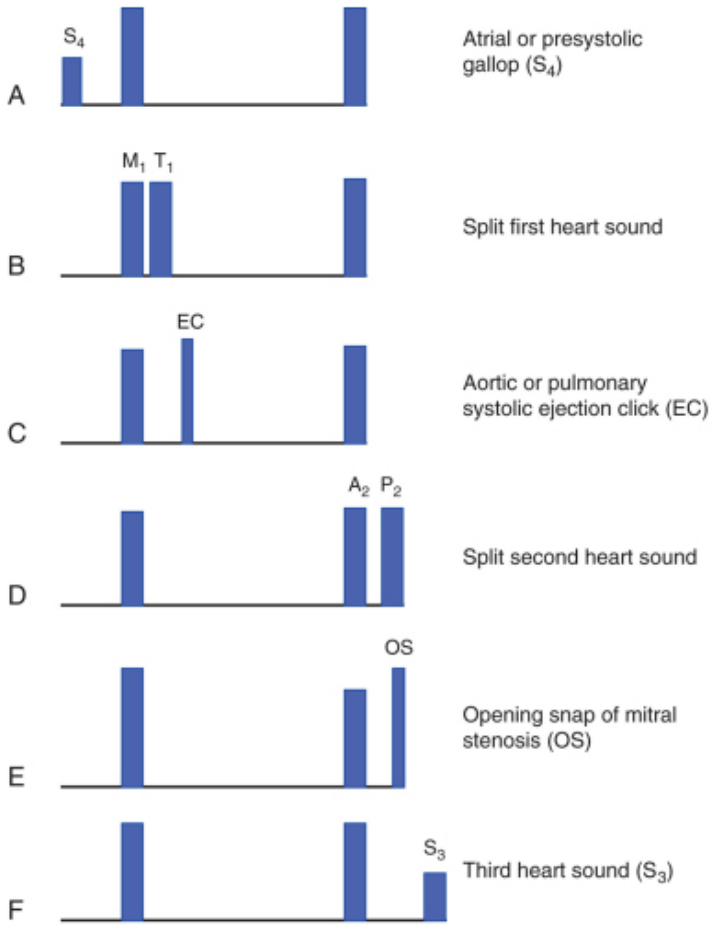
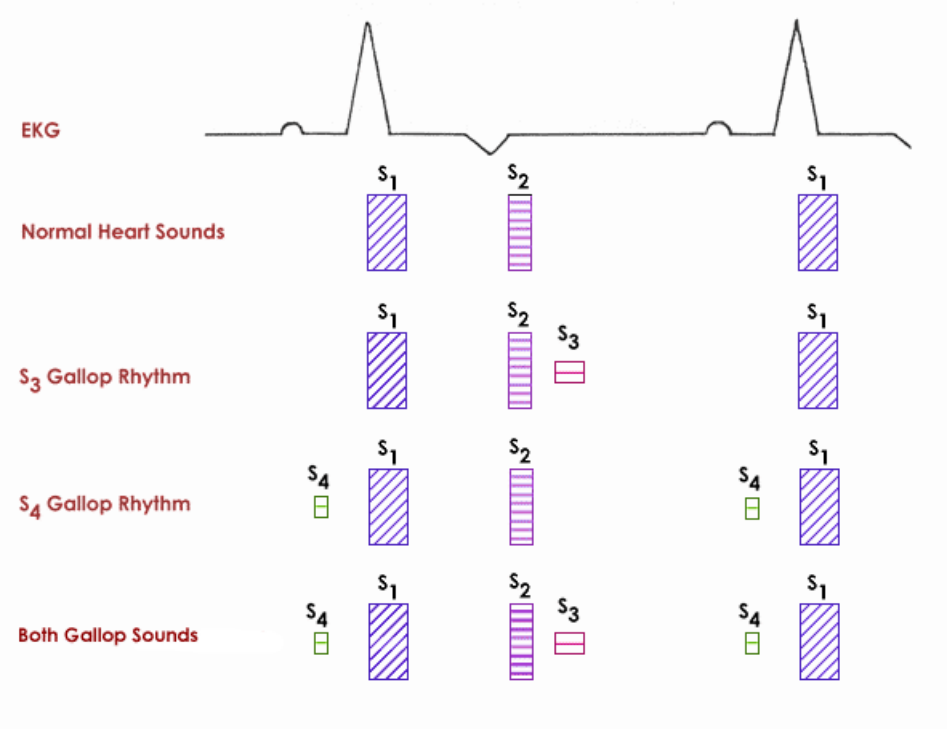
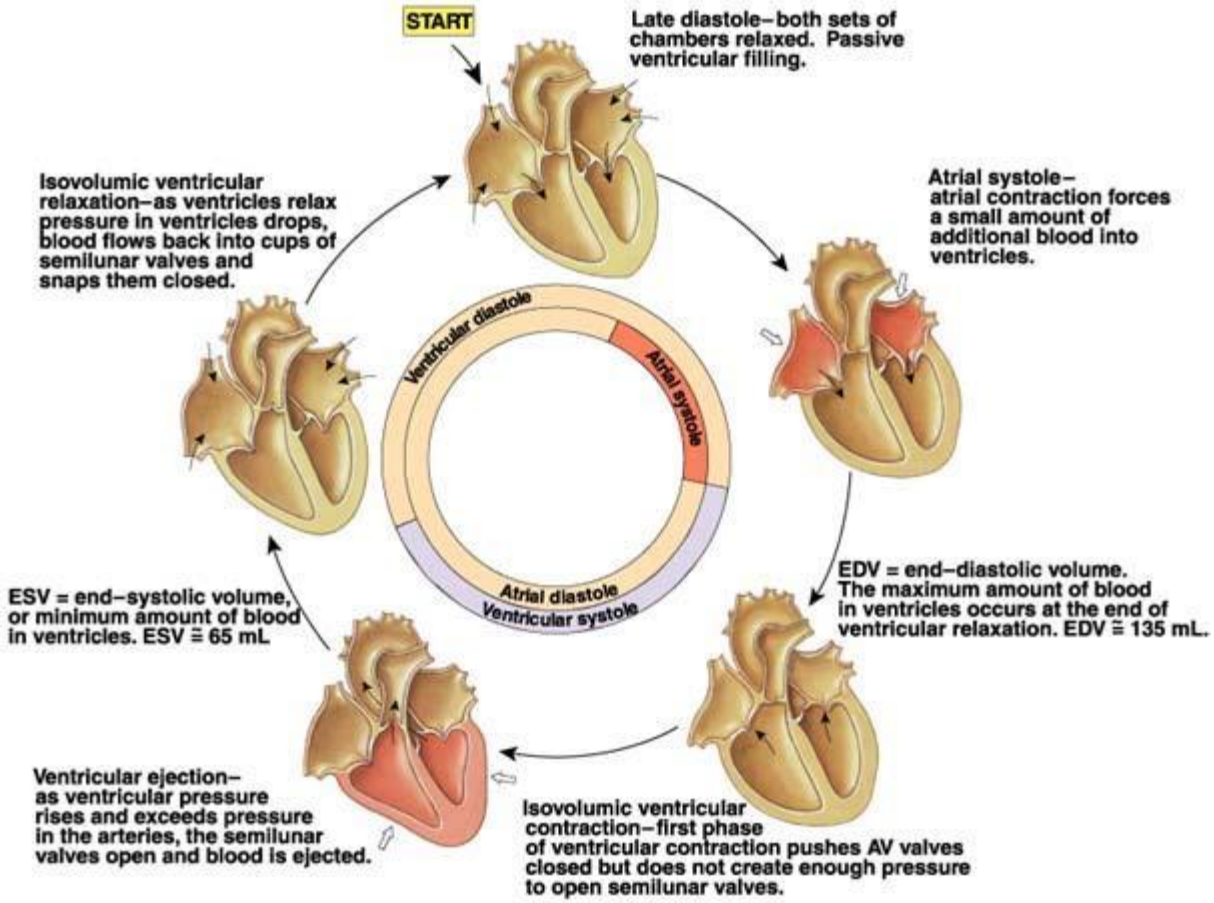
Heart sounds





Heart murmurs



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Heart murmurs

- Localization; side of maximal intensity
- Tone
- Timing
- Grade
- Radiation
- Realtion to heart sounds (systolic, diastolic, continuous)
- Realation with posture and respiation

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Heart murmurs - grade

- I - faint, heard only with special effort
- II – soft
- III – loud
- IV – loud with thrill
- V – audible with stetoscope barely touching the chest
- VI – murmur audible without the stethoscope

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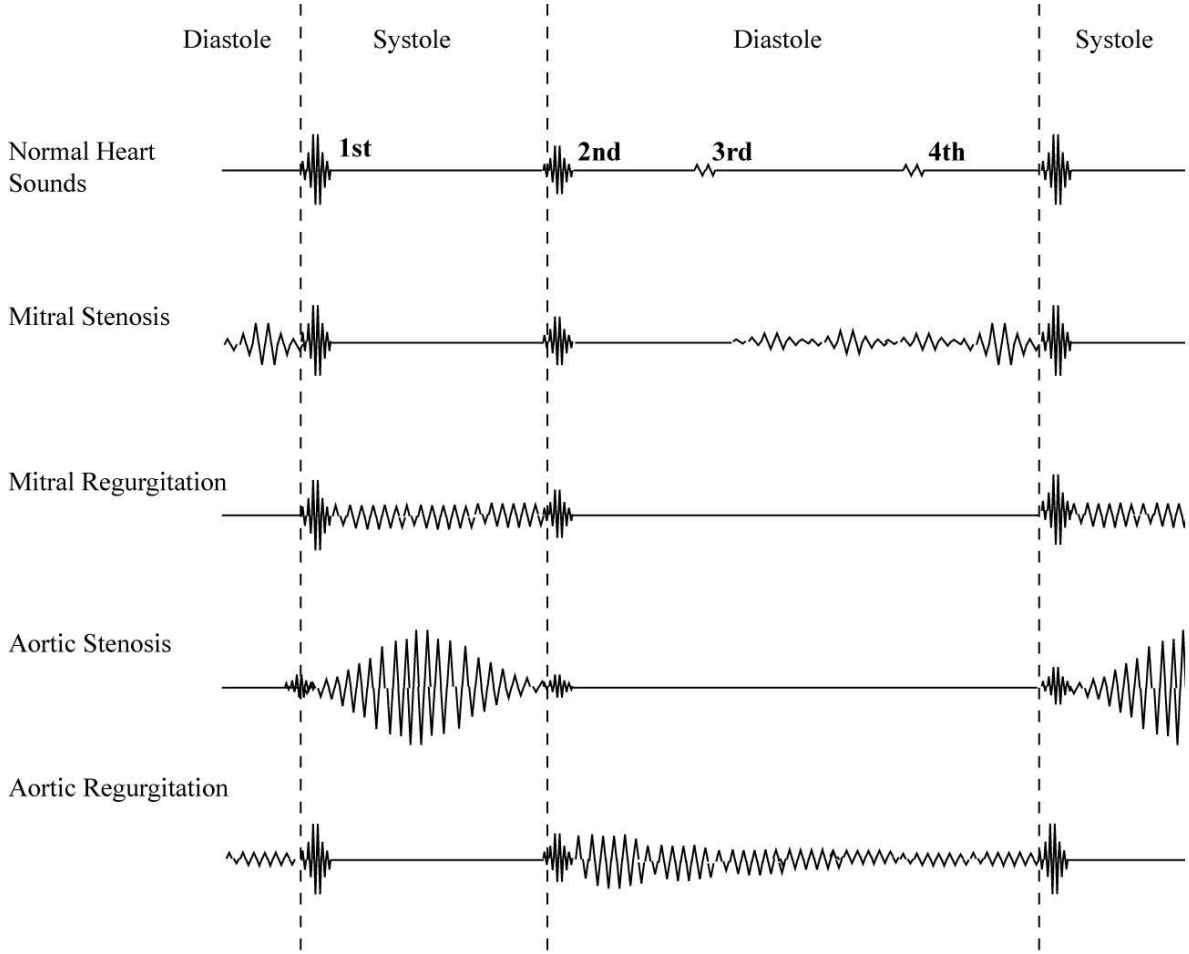
Heart murmurs



- www.easyauscultation.com

Symptoms and signs typical of heart failure (1)

Symptoms	Signs
Typical	***More specific***
Breathlessness	Elevated jugular venous pressure
Orthopnoea	Hepatojugular reflux
Paroxysmal nocturnal dyspnoea	Third heart sound (gallop rhythm)
Reduced exercice tolerance	Laterally displaced apical impulse
Fatigue, tiredness, increased time to recover after exercise	Cardiac murmur
Ankle swelling	

Symptoms and signs typical of heart failure (2)

Symptoms	Signs
Less typical	***Less specific***
Nocturnal cough	Peripheral oedema (ankle, sacral, scrotal)
Wheezing	Pulmonary crepitations
Weight gain (>2 kg/week)	Reduced air entry and dullness to percussion at lung bases (pleural effusion)
Weight loss (in advanced heart failure)	Tachycardia
Bloated feeling	Irregular pulse
Loss of appetite	Tachypnoea (>16 breaths/min)
Confusion (especially in the elderly)	Hepatomegaly
Depression	Ascites
Palpitations	Tissue wasting (cachexia)
Syncope	

Traditional clinical classification of chest pain

Typical angina (definite)	Meets all three of the following characteristics: • substernal chest discomfort of characteristic quality and duration; • provoked by exertion or emotional stress; • relieved by rest and/or nitrates within minutes.
Atypical angina (probable)	Meets two of these characteristics.
Non-anginal chest pain	Lacks or meets only one or none of the characteristics.

Classification of angina severity according to the Canadian Cardiovascular Society

Class I	**Ordinary activity does not cause angina such as walking and climbing stairs.** Angina with strenuous or rapid or prolonged exertion at work or recreation.
Class II	**Slight limitation of ordinary activity.** Angina on walking or climbing stairs rapidly, walking or stair climbing after meals, or in cold, wind or under emotional stress, or only during the first few hours after awakening. Walking more than two blocks on the level and climbing more than one flight of ordinary stairs at a normal pace and in normal conditions.
Class III	**Marked limitation of ordinary physical activity.** Angina on walking one to two blocks[a] on the level or one flight of stairs in normal conditions and at a normal pace.
Class IV	**Inability to carry on any physical activity without discomfort,** angina syndrome may be present at rest.

[a]Equivalent to 100–200 m.

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Thank you

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