Cardiovascular system Assessment

(A) Taking a cardiac History

Personal and social history:

- Age.
- Smoking. - No of packs per day.
  - Years of smoking.
  - Exposure to secondhand smoke.
  - History of attempts to quit, methods and results.
- Ask about possible precipitating factors or triggers such as medications, smoke
- Sedentary lifestyle or immobilization

Past Health History

- Ask the patient about a history of chest pain, shortness of breath, fatigue, alcohol and tobacco use, anemia, syncope, hypertension, rheumatic fever, streptococcal throat infections, palpitations, and edema.

- Ask about any previous diagnoses of congenital heart disease, arrhythmias, unstable angina, MI, coronary artery bypass graft, angiography, or any other cardiac surgery.

Chief complaint / Present illness

- Ask the patient what problem has brought him or her to the hospital. Common Clinical Manifestations of Cardiovascular Disorders include:
  - Dyspnea (exertional, orthopnea, paroxysmal noctural dyspnea).
  - Chest Pain
  - Edema/Ascites
  - Palpitation
  - Fatigue
  - Syncope and Fainting
  - Cyanosis
  - Clubbing of fingers

- Ask questions to assess chest pain:
  - Where is the location of pain on the chest?.
  - What does the pain feel like? (Pressure, heaviness, burning).
  - How severe is it on a scale of 0 to 10?
  - What causes the pain? (Exertion, stress).
  - Does anything relieve it? (Rest, nitroglycerin).
  - Does it spread to other site? E.g. shoulder or jaw.
  - How long does the pain last?
  - Do you have any additional symptoms? (Shortness of breath, palpitations, dizziness, sweating).

- Angina pectoris:
  - Characteristics: Substernal pain may spread widely throughout chest. Pain in shoulders and hands may be present.
  - Duration: 5–15 min
  - Precipitating factors: exertion, emotion, heavy eating, and cold.
  - Relieving measures: Rest, nitroglycerin, oxygen.

- Myocardial infarction:
  - Characteristics: Substernal or retrosternal pain spreading across chest; may radiate to inside of arm, neck, or jaw.
  - Duration: <15 min
  - Precipitating factors: Occurs spontaneously but may be sequel to unstable angina.
  - Relieving measures: Morphine sulfate, successful reperfusion of blocked coronary artery.

Medications

- Assess the patient‘s current and past use of medications

Social history and habits

- Ask the patient about the presence of major cardiovascular risk factors.

A. Non-Modifiable Risk Factor: e.g. age, gender, race and /or heredity
B. Modifiable Risk Factor: e.g. stress, diet, exercise, sedentary lifestyle, cigarette smoking, alcohol, hypertension, contraceptive pills hyperlipidemia, obesity, and/or DM

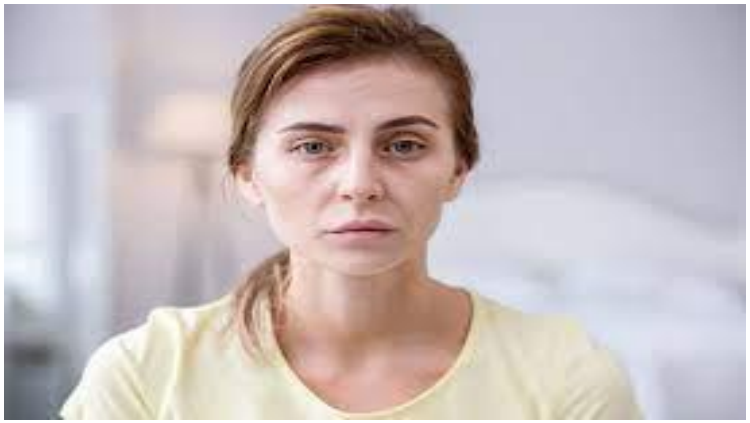
(B) Physical examination:

Vital Signs

- Assess the pulse rate, rhythm, and quality of the arterial blood vessel.
  - Normal range is 60-100 beats per minute
  - Tachycardia is abnormal increase in HR greater than 100 b/m.
  - Bradycardia is abnormal decrease in HR less than 60 b/m.

Inspection

- Inspect skin color.
  - **Pallor:** a decrease in the color of the skin—is caused by lack of oxyhemoglobin as a result of anemia or decreased arterial perfusion.



- Peripheral cyanosis: a bluish discoloration of the nails and skin of the nose, lips, earlobes, and extremities suggesting decreased flow rate of blood to a particular area. This may occur normally in peripheral vasoconstriction associated with a cold environment, in patients with anxiety, or in disease states such as heart failure
- Central cyanosis: a bluish tinge observed in the tongue and buccal mucosa denoting serious cardiac disorders (pulmonary edema and congenital heart disease).

- **Ecchymosis (bruise)**: a purplish-blue color fading to green, yellow, or brown over time—is associated with blood outside of the blood vessels and is usually caused by trauma or prolonged clotting times

- Inspect the extremities for conditions such as edema, clubbing of the nail beds and varicosities.

- **Edema** in the extremities can be caused by gravity, interruption of venous return, or right sided heart failure.

- **Jugular venous distention** indicates an abnormal increase in the volume of the venous system - Inspect the jugular veins in the neck for distention; while the patient's head of bed is elevated 30-45 degrees. Normally the veins are not apparent if the head of the bed is elevated. sociated with right-sided heart failure.

(B) Physical examination: (cont.)

Palpation

- Palpate the upper and lower extremities for temperature, moisture, pulses, and edema bilaterally to assess for symmetry.
- Assess edema by depressing the skin over the tibia or medial malleolus for 5 seconds.
- Palpate the pulses in the neck and extremities for information on arterial blood flow. It is important to palpate each carotid pulse separately.

- Compare the characteristics of the arteries on the right and left extremities to determine symmetry.
- Assess capillary refill to assess arterial flow to the extremities. Nail color should return after pressure in less than 2-3 seconds with normal peripheral perfusion.
- Palpate patient's chest over the fifth left intercostals space (ICS) close to the sternum and in the left midclavicular line.

(B) Physical examination: (cont.)

Auscultation

- Auscultate the carotid arteries, abdominal aorta, and femoral artery using the bell of the stethoscope.
- Auscultate apical pulse while palpating radial pulse. Any discrepancy between apical pulse and pulses felt is noted.

❖ Heart sounds:

- The first heart sound (S1) is associated with closure of the tricuspid and mitral valves (It has a soft lubb sound). It signals the beginning of systole (heard louder at the apex).
- The second heart sound (S2) is associated with closure of the aortic and pulmonary valves (It has a sharp dupp sound). It signals the beginning of diastole (heard louder at the base).
- **Murmurs** are sounds produced by turbulent blood flow across diseased heart valves (Incompetent or stenotic).

Diagnostic Studies of Cardiovasular System

- **Blood Studies.**
  - Coagulation Screening Test
    - Bleeding Time: 2-9 minutes.
    - INR (The international normalized ratio): Normal INR in healthy people is 1.1 or below.

An INR range of 2.0 to 3.0 is generally an effective therapeutic range for people taking warfarin for disorders such as atrial fibrillation or a blood clot in the leg or lung.

- Partial Thromboplastin Time (PTT) – is used to identify deficiencies of coagulation factors, prothrombin fibrinogen and to monitors heparin therapy. Normal value= 25-35 sec.

- Prothrombin Time (PT) used to determine dosages of oral anti-coagulant. Normal value = 12-14 sec.

❖ **Troponin (cardiac):**

Protein that are released after MI.

- Negative: <0.5 ng/mL

- Indeterminate or suspicious for injury to myocardium: 0.5-2.3 ng/mL

- Positive for myocardial injury: >2.3 ng/mL

❖ **CK-MB**: Cardio-specific enzyme that is released in the presence of myocardial tissue injury.

- Elevates in MI within 4-6 hours, peaks in 18 hours and then declines till 3 days.

- Normal value is 5 to 25 IU/L.

❖Serum Lipids

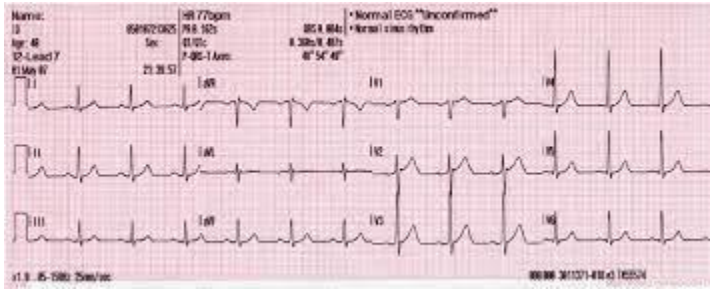
- **Cholesterol**:<200 mg/dL
- **Triglycerides**: <150 mg/dL
- **High density lipoprotein** (HDL): Male: >40 mg/d

  Female: >50 mg/dL

- Low risk for CAD: ≥60 mg/dL
- High risk for CAD: <40 mg/dL

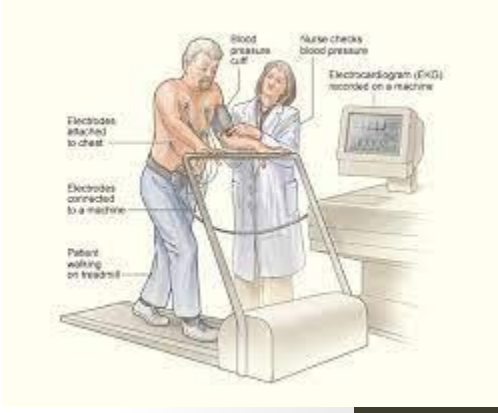
- Chest X-Ray

- ECG



- Holter monitoring: Recording of ECG rhythm for 24-48 hr and then correlating rhythm changes with symptoms and activities recorded in diary.

- Exercise or Stress Testing: used to evaluate the effect of exercise tolerance on cardiovascular function..



- Echocardiogram

- Transesophageal echocardiogram (TEE)
- Magnetic resonance angiography (MRA)
- Cardiac computed tomography (CT)
- Cardiac catheterization/coronary angiograghy