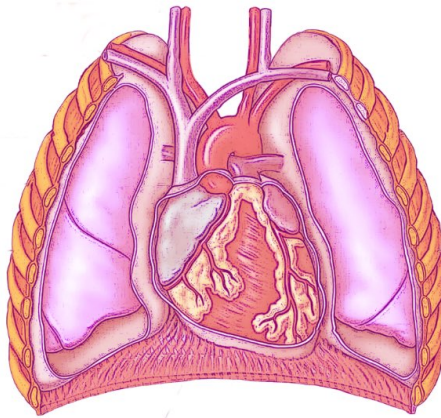




Internal Medicine



Topic : CVS - Physical Examination
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1. Complete and Comprehensive Physical Examination of the Cardiovascular System

The cardiovascular exam is essential to evaluating a patient with suspected cardiovascular disease. A thorough examination should follow a systematic approach, which includes inspection, palpation, percussion (rarely used in practice), and auscultation.

- **Inspection:** Start by observing the patient's general appearance, posture, and color. Look for signs such as cyanosis, pallor, or clubbing, which may suggest underlying heart or respiratory issues.
- **Jugular Venous Pressure (JVP):** Assess the neck veins for distention, which could indicate right-sided heart failure or fluid overload.
- **Palpation:** Palpate the precordium for any abnormal pulsations or thrills. Feel for the apex beat, which is usually located at the 5th intercostal space in the midclavicular line. Displacement of the apex beat may suggest left ventricular hypertrophy.
- **Auscultation:** Listen to the heart sounds, murmurs, and rubs. Start with the aortic area (right second intercostal space), pulmonic area (left second intercostal space), tricuspid area (left lower sternal border), and mitral area (left 5th intercostal space, midclavicular line).

2. Determine Venous Pressure by Examination of Neck Veins

- **Jugular Venous Pressure (JVP):** The JVP is an indirect measure of right atrial pressure, and it can help assess fluid status and the function of the right heart. To assess JVP:
 - Position the patient at a 30-45 degree angle.
 - Inspect the neck for the visible pulsation of the internal jugular vein (not the carotid artery).
 - Measure the height of the pulsation above the sternal angle (the normal JVP is < 3-4 cm).
 - Elevation of JVP indicates right heart failure, volume overload, or obstruction to venous return.

3. Assess Arterial Pulses and Recognize Pulsus Alternans, Bisferiens Pulse, and Paradoxical Pulse

- **Arterial Pulses:** Palpating the arterial pulses (carotid, radial, femoral, etc.) gives information about blood flow and heart function. Check for:
 - **Pulsus alternans:** Alternating strong and weak beats, which suggests left ventricular dysfunction (e.g., in heart failure).
 - **Bisferiens pulse:** A double-peaked pulse, often seen in aortic regurgitation or combined aortic stenosis and regurgitation.
 - **Paradoxical pulse:** An exaggerated decrease in systolic blood pressure during inspiration (> 10 mm Hg), often associated with pericardial tamponade or severe asthma.

4. Perform Hepatojugular Reflux Test to Assess Venous Pressure

This test assesses the right heart's ability to handle increased venous return.

- **Procedure:** Have the patient lie at a 45-degree angle, and apply firm pressure to the upper abdomen (over the liver).
- **Positive Test:** If the JVP rises by more than 3-4 cm and stays elevated with the pressure applied, it suggests right heart failure or volume overload, indicating that the heart cannot accommodate increased venous return effectively.

5. On Cardiac Auscultation, Recognize Systolic and Diastolic Murmur Effects of Physiologic and Pharmacologic Interventions

Cardiac auscultation helps identify murmurs, which are abnormal sounds due to turbulent blood flow.

- **Systolic Murmurs:** Occur during ventricular contraction. They can be associated with conditions like aortic stenosis, mitral regurgitation, and tricuspid regurgitation.
- **Diastolic Murmurs:** Occur during ventricular relaxation. These are usually associated with conditions like aortic regurgitation and mitral stenosis.
- **Effect of Interventions:**
 - **Physiologic changes:** Exercise, fever, or anemia can increase blood flow, leading to a louder murmur.
 - **Pharmacologic interventions:** Medications like beta-blockers or ACE inhibitors can reduce afterload or heart rate, affecting murmur intensity.

6. Pericardial Friction Rub

- **What it is:** A pericardial friction rub is a high-pitched sound caused by the rubbing of the inflamed pericardial layers.
- **Auscultation:** Listen at the left lower sternal border. The rub is often described as a “grating” or “scratchy” sound that is heard during both systole and diastole. It is best heard when the patient leans forward and holds their breath.
- **Associated Conditions:** Commonly heard in pericarditis.

7. On Cardiac Auscultation, Recognize S-1, S-2, and Normal Physiologic Splitting

- **S-1:** The first heart sound, associated with the closure of the mitral and tricuspid valves. It marks the beginning of systole.
- **S-2:** The second heart sound, associated with the closure of the aortic and pulmonic valves. It marks the end of systole and the beginning of diastole.
- **Normal Splitting of S-2:** During inspiration, the pulmonic valve closes slightly later than the aortic valve due to increased venous return. This results in a split S-2 (heard as two distinct sounds).
- **Abnormal Splitting:** Can be heard in conditions like right bundle branch block (RBBB) or pulmonic stenosis.

8. S-3 and S-4, and How They Are Best Appreciated

- **S-3 (ventricular gallop):** A low-frequency sound occurring early in diastole, just after S-2. It is associated with rapid ventricular filling and is often heard in conditions like heart failure and volume overload.
- **Best appreciated with the bell of the stethoscope at the apex** in the left lateral decubitus position.
- **S-4 (atrial gallop):** A low-frequency sound occurring late in diastole, just before S-1. It is caused by atrial contraction against a stiff or non-compliant ventricle and is associated with conditions like hypertensive heart disease or aortic stenosis.
- **Best appreciated with the bell of the stethoscope at the apex** while the patient is in the left lateral decubitus position.

9. Special Characteristics of the Murmur of Mitral Valve Prolapse (MVP) and Hypertrophic Cardiomyopathy (HCM)

- **MVP:**
 - **Murmur characteristics:** A mid-systolic click followed by a late systolic murmur. The murmur results from regurgitation due to mitral valve prolapse.
 - **Change with position:** The murmur often becomes louder when the patient is in the standing position or after the Valsalva maneuver due to increased regurgitation.
- **HCM:**
 - **Murmur characteristics:** A harsh systolic murmur heard best at the left sternal border. It occurs due to outflow obstruction of the left ventricle.
 - **Change with position:** The murmur becomes louder with the Valsalva maneuver or standing due to decreased venous return and left ventricular filling, which increases the obstruction.

10. Pericardial Friction Rub

This sound, often described as a scratchy or grating noise, is best heard during both systole and diastole. The rub is due to inflammation of the pericardium, often caused by pericarditis. It is most audible when the patient is sitting upright, leaning forward, and holding their breath.

- **Auscultation Location:** Left lower sternal border (sometimes heard over the apex).
- **Clinical Context:** Pericardial friction rub is commonly heard in conditions like acute pericarditis, post-myocardial infarction (Dressler's syndrome), and uremic pericarditis.

Summary

A thorough cardiovascular physical exam involves assessing the patient's symptoms, inspecting the neck veins, palpating arterial pulses, and auscultating heart sounds and murmurs. By carefully listening to and recognizing different heart sounds, murmurs, and signs like JVP and hepatojugular reflux, you can identify many cardiovascular conditions and guide further diagnostic workup. Understanding the physiological and pathological changes, as well as how they alter auscultation findings, is key for any medical student or clinician involved in diagnosing cardiovascular diseases.