

Cardiovascular System Physical Examination

- Refer to Macleod's videos on JU clinical.

Before any examination make sure to: introduce yourself, take permission, ensure good privacy and illumination, warmth of the room and good hand hygiene.

Comment: After introducing myself, taking permission from the patient, ensuring good privacy and illumination, warmth of the room, washing my hands, I will now start my examination by being on the right side of my patient.

General examination:

Make sure that the patient is in the correct position & the exposure is appropriate:

Position: semi-sitting position (45°)

Exposure: From the Anterior chest till the umbilicus.

Ask about consciousness and orientation (place, time and person).

Ask yourself these questions:

- Is he lying comfortably on his bed?
- Does he look cyanosed?
- Does he look pale?

Comment: my patient looks conscious, alert, oriented to place, time and person, lying comfortably on his bed, not in distress, not in pain, not cyanosed and not pale.

Vital signs:

- Blood pressure
- Respiratory rate (normal 12 - 20 breath per minute)
- Pulse rate: radial pulse over one minute
- Temp.

About the Pulse:

1) Radial pulse: put your 3 fingers over the radial artery which lies lateral to the tendon of flexor carpi radialis (measure it over one minute).

Note: In case of smaller arteries such as the radial artery we only comment on the rate & rhythm and we need a larger artery such as the brachial artery in order to comment on the volume & character.

- **Rate:** normal rate → 60 - 100 beats per minute.
- **Rhythm:** normal sinus rhythm or regular rhythm.
- **Compressibility:** compressible.

About the radial artery:

- **Radioradial delay:** palpate the radial pulse of both hands simultaneously.
Ex: Aortic dissection or brachial artery abnormalities.

- **Collapsing pulse:** First ask the patient if he has any pain in his shoulder or arm
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Ex: Aortic regurgitation
- **Pulse deficit:** Auscultate the apical HR and count the radial pulse at the same time and then subtract the radial pulse from the apical HR. HR: heart rate
Ex: A-Fib

Note: There's also Radio-femoral delay (In coarctation of the Aorta) but you'll not be asked to do it in the OSCE.

2) Brachial pulse: Put your thumb over the brachial artery which lies medial to the biceps tendon (measure it over one minute)

Here you should comment on the character and volume also.

- **Rate:** normal rate → 60 - 100 beat per minute.
- **Rhythm:** normal sinus rhythm or regular rhythm.
- **Volume:** good volume.
- **Character:** good character.
- **Compressibility:** compressible.

Abnormalities regarding the volume and character:

- Volume: "Read the examples from the book".
 1. Large pulse volume (high SV)
 2. Low pulse volume (low SV)
- Character :
 - A. Slow rising pulse: gradual upstroke with a reduced peak occurring late in the systole (aortic stenosis)
 - B. Pulse bisferens: increase pulse with a double systolic peak separated by distinct mid-systolic dip (aortic regurgitation and aortic stenosis + regurgitation)
 - C. Brachio-brachial delay: a difference > 10mmhg suggest aortic or subclavian artery disease.
 - D. Pulse alterans: beat to beat variation in pulse volume with a normal rhythm (occurs in advanced HF)

Blood pressure: BP should be measured from both hands in supine and erect position.

Hands:

It's always better to examine the hands right after measuring the BP and Pulse rate so you don't forget it in the OSCE.

- **Nails:**
Tar staining, peripheral cyanosis, splinter hemorrhages, nails clubbing.
Note that it's normal if you find 1-2 splinter hemorrhages (could be due to a trauma).
- **Dorsum of the hands:**
Temperature, Fine tremor, flapping tremor (astrexis), xanthomata.

- **Palm of the hands:**
Janeway lesions or osler's node (infective endocarditis), xanthomata.
- **Entire skin:**
Petechial rash → caused by vasculitis and endocarditis.

Face:

- Conjunctiva → pallor (anemia) / petechial hemorrhage.
- Iris → conrenal arcus.
- Medial aspect of the eyelids → xanthelasmata.
- Roths spots (on fundoscopy) → anemia, leukemia.
- Malar flush → mitral stenosis.
- Also look for dental hygiene and central cyanosis.

Comment: by inspection, there's no conjunctival pallor, no petechial hemorrhage was noticed, no corneal arcus or xanthelasmata suggesting hyperlipidemia, no malar flush, no central cyanosis and the patient has good dental hygiene.

Neck: masses, dilated veins, scars.

Comment: there are no scars, no masses and no dilated veins.

While examining the neck you should also examine the carotid pulse and JVP.

3) Carotid Pulse: put 2 fingers over the carotid artery which is located 2 cm below the angle of the jaw and over the anterior part of sternocleidomastoid muscle.

Comment: by inspection, I see one peak outwards, palpable, not affected by obstruction in the neck, not affected by respiration or any position. "The last 3 points to differentiate it between the JVP"

Now comment on the 5 things:

- **Rate:** normal rate → 60 - 100 beat per minute.
 - **Rhythm:** normal sinus rhythm or regular rhythm.
 - **Volume:** good volume.
 - **Character:** good character.
 - **Compressibility:** compressible.
- **Carotid bruit:** Ask the patient to take deep breath, expiration, ويجبس نفسه. Put the stethoscope diaphragm over the carotid pulse.

JVP:

In order to relax the neck muscles put one pillow under the patient's head, turn his head to the left side.

➤ **Inspection:**

- Use a torch and try to identify the pulse.
- Ask the patient to take a deep breath and hold it

- Ask the patient to sit upright and then lie flat
- Do the abdominojugular reflex test.
- Obliteration of the neck

Comment: I see two peaks, inward pulsation, not palpable, increases when lying flat and with abdominojugular test, decreases with deep breath, disappear on sitting upright and with neck obliteration.

Measurements:

- Locate the highest point of the jugular venous wave.
- Place any object from that point horizontal to the ground.
- Measure the length by a ruler, located vertically to the sternal angle.
- Add 5cm.
- JVP is normally less than 9cm.
- Causes of raised JVP: Rt. Heart dilatation in PE, Cor pulmonale, Obstruction of SVC by lung CA.

➤ **Auscultation:** by diaphragm → venous hum

Precordium:

➤ **By inspection:**

- ***from the foot of the bed:***

Ask the patient to take a deep breath and comment:

Comment: Symmetrical bilateral chest expansion, No chest deformities such as: pectus excavatum or carinatum, Pattern of breathing: 1. Male: Abdominothoracic
2. Female: thoracoabdominal

- ***Now continue from the Right side:***

Comment: No visible masses, no scars, no dilated veins, normal hair distribution, no visible pulsation (AAA). I can comment on the apex beat if it was visible.

➤ **Palpation:**

- **Precordium:** Maintain eye-eye contact and palpate over the precordium, parallel to the intercostal spaces, and comment if there's any tenderness.
- **Apex beat:** count to the 5th intercostal space and then feel the apex beat by the whole palm of your hand and then localize it by 2 fingers, if you didn't feel it turn the patient's body to the left.

Comment: Apex beat is located at the 5th intercostal space, at mid-clavicular line, not displaced, gentle tapping.

- **Heave:** by the heel of the hand, palpate over the left sternal border and the apex, while the patient is holding his breath on expiration.
- **Thrills:** by the pads of the fingers palpate over the left and right sternal border + the apex

Comment: there's no heave nor thrills.

- Remember: (Thrills → Three → Three areas to palpate)

➤ **Auscultation:**

Listen with your stethoscope diaphragm at the 4 auscultation areas:

- Apex → mitral valve
- Lower left sternal border → tricuspid valve
- Upper right sternal border → Aortic valve
- Upper left sternal border → pulmonic valve

Listen with you stethoscope bell at:

- Apex → Mitral stenosis, added sounds (S3,S4)
- Lower left sternal border (Tricuspid Area) → Tricuspid regurgitation

Special maneuvers:

- Roll the patient to the left side, listen by the bell over the apex for the murmur of → Mitral Stenosis
- Ask the patient to sit upright, lean forward and hold breath on expiration, listen by the diaphragm over the 2nd right intercostal space and the 3rd left sternal edge for the murmur of → Aortic regurgitation.

Radiation:

- Listen by the diaphragm over the carotid arteries for the radiation of the murmur of → Aortic Stenosis or for carotid bruits.
- Listen over the left axilla for the radiation of the murmur of → Mitral regurgitation

Comment: normal heart sounds (S1, S2), no splitting, no added sounds, no pericardial rub and no murmurs.

