

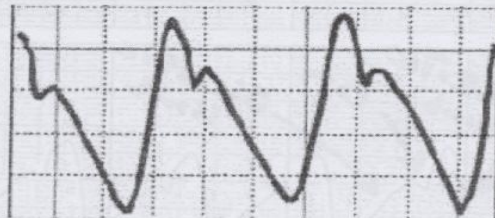
PULSES

Carotid Arterial
Jugular Venous

Dr. Taj

PULSES: Causes

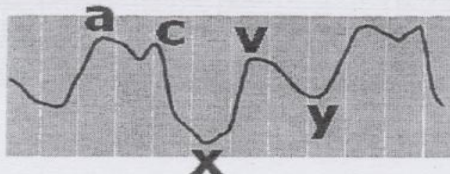
CAROTID ARTERIAL PULSE



When we record the carotid arterial pulse, we get a graph having:

- ❖ **Anacrotic limb (ANA means up)** – It is a record of pressure wave in the artery (arterial wall) during the maximum ejection phase of ventricular systole.
- ❖ **Dicrotic Notch (Dn) or Incisura** – It is due to closure of aortic valve.
- ❖ **Dicrotic limb** – Due to elastic recoil of arterial wall, pressure is maintained to 80 mmHg in the artery during ventricular diastole.

JUGULAR VENOUS PULSE (J.V.P.)



Causes of these waves are:

- “a” wave:** It is due to right atrial contraction.
- “c” wave:** It is due to bulging of tricuspid valve into right atrium during isovolumetric contraction phase of ventricular systole. OR it is a Carotid Artifact.
- “x” descent:** It is due to downward displacement of tricuspid valve by the contraction of papillary muscles during ventricular systole.
- “v” wave:** It is due to increase in right atrial pressure, when right atrium continues to fill with blood from great veins against closed tricuspid valve.
- “y” descent:** It is due to fall in right atrial pressure, when the blood flows out of the right atrium into the right ventricle as soon as the tricuspid valve opens.

PULSES: Causes Cont...

CAROTID ARTERIAL PULSE

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- Anacrotic limb (ANA means up) - It is a record of pressure wave in the artery (arterial wall) during the maximum ejection phase of ventricular systole.
- Dicrotic Notch (Dn) or Incisura - It is due to closure of Aortic valve.
- Dicrotic limb:- Due to elastic recoil of arterial wall, pressure is maintained to 80 mmHg in the artery during ventricular diastole.

JUGULAR VENOUS PULSE (J.V.P)

Causes of these waves are:

- 'a' wave: It is due to right atrial contraction.
- 'c' wave: Due to bulging of tricuspid valve into the right atrium, during isovolumetric contraction.
- 'v' wave: Increased pressure in right atrium due to filling of atrium with blood, when tricuspid valve is closed.
- 'x' descent: Due to downward displacement of AV ring during ventricular systole.
- 'y' descent: Opening of tricuspid valve, with rapid flow of blood from right atrium to right ventricle.

ARTERIAL PULSES: Parts

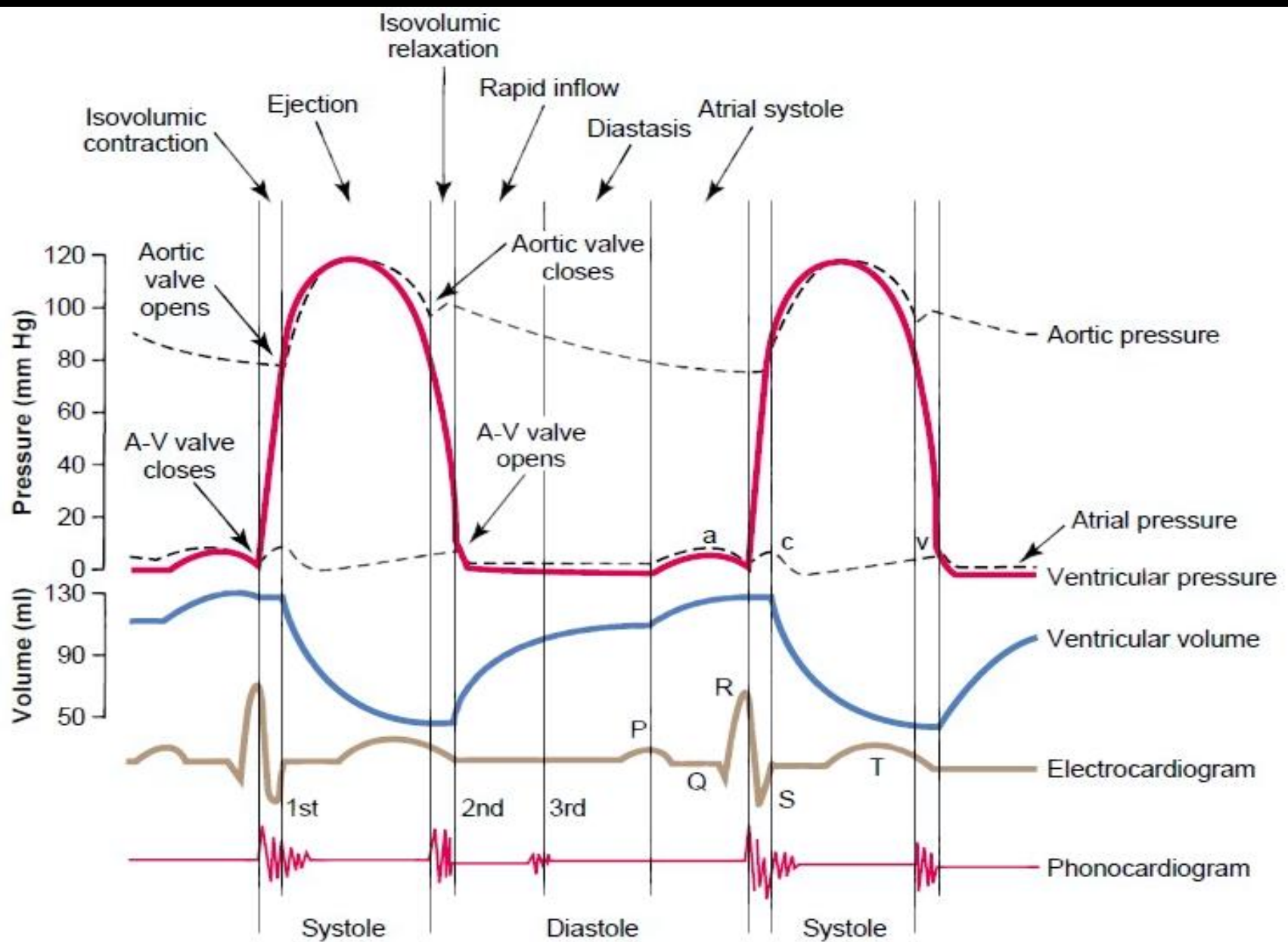
When we record a carotid arterial pulse we get a graph having the following:

- An “**Anacrotic Limb**” (Ana = Up): It is a pressure wave in the arterial wall during the Max. Ejection period of the Systole.
- “**Dicrotic Notch**” or Incisura: Due to the closure of the Aortic Valve.
- “**Dicrotic Limb**”: Due to the elastic recoil of the arterial wall causing the pressure in the arterial wall during Diastole.

VENOUS PULSE (JVP): Parts

- **“a” wave:** It is due to Rt. Atrial contraction. (+ve wave)
- **“c” wave:** It is due to the bulging of the Tricuspid valve into the Rt. Atrium during Isovolumetric Contraction. (+ve wave)
- **“v” wave:** Due to the filling of the Right Atrium with a closed tricuspid valve. (+ve wave)

- **“x” descent:** Due to downwards displacement of the AV rings during ventricular systole pressure thus creating a suction or a negative pressure in the Rt. Atrium. (- ve wave)
- **“y” descent:** Due to the fall in the Rt. Atrial Pressure when the blood starts to flow from the Right Atrium into the Rt. Ventricle during passive filling. (- ve wave)



The Events of the Cardiac Cycle

Waves

- **a** - presystolic; produced by right atrial contraction.
- **c** - bulging of the tricuspid valve into the right atrium during ventricular systole (isovolumetric phase).
- **v** - occurs in late systole; increased blood in the right atrium from venous return.

Descents

- **x** - a combination of atrial relaxation, downward movement of the tricuspid valve and ventricular systole.
- **y** - the tricuspid valve opens and blood flows into the right ventricle.

Causes of raised jugular venous pressure

- Heart failure.
- Constrictive pericarditis (JVP increases on inspiration - called Kussmaul's sign).
- Cardiac tamponade.
- Fluid overload - e.g., renal disease.
- Superior vena cava obstruction (no pulsation).

Abnormalities of the a wave

It disappears in atrial fibrillation.

Large a waves occur in any cause of right ventricular hypertrophy (pulmonary hypertension and pulmonary stenosis) and tricuspid stenosis.

Extra large a waves (called **cannon waves**) in complete heart block and ventricular tachycardia.

Prominent v waves

Tricuspid regurgitation - called cv or v waves and occurring at the same time as systole (a combination of v wave and loss of x descent); there may be earlobe movement.

Slow y descent

Tricuspid stenosis.

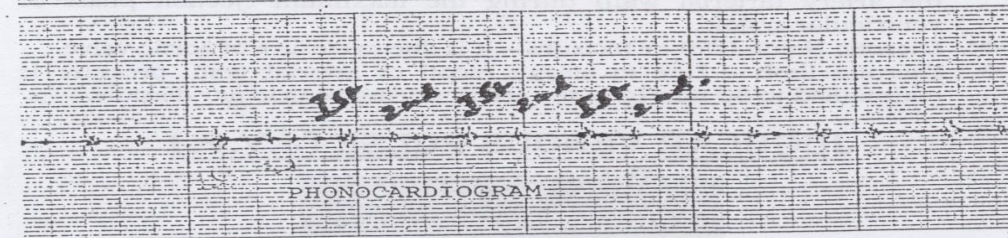
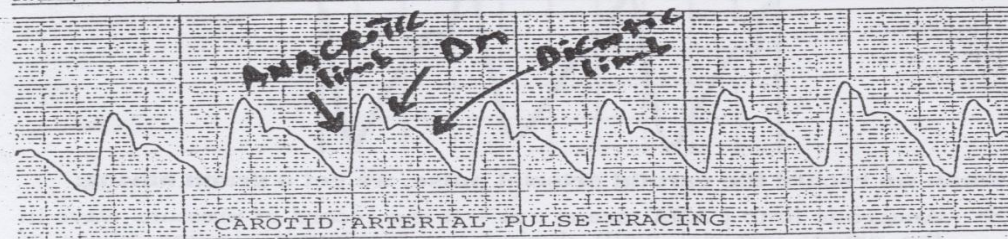
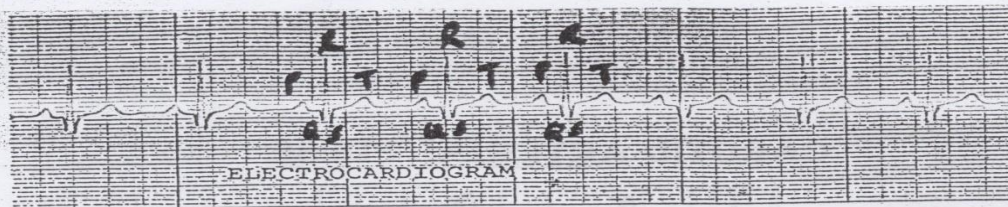
Right atrial myxoma.

Steep y descent

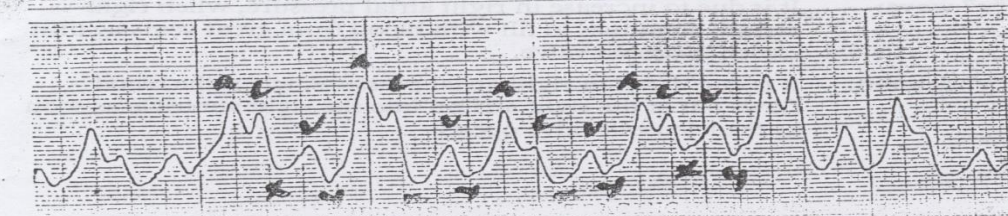
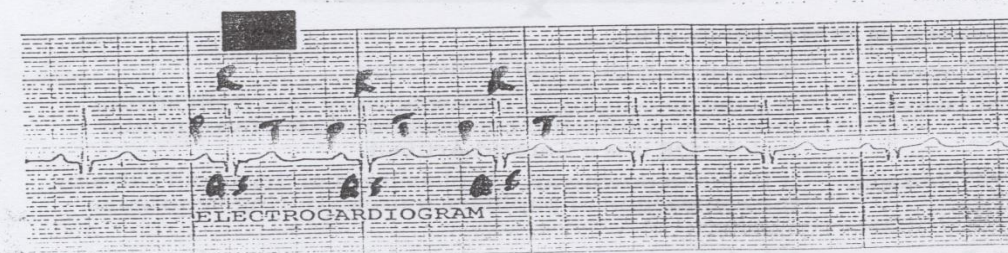
- Right ventricular failure.
- Constrictive pericarditis.
- Tricuspid regurgitation.

(The last two conditions have a rapid rise and fall of the JVP - called Friedreich's sign.)

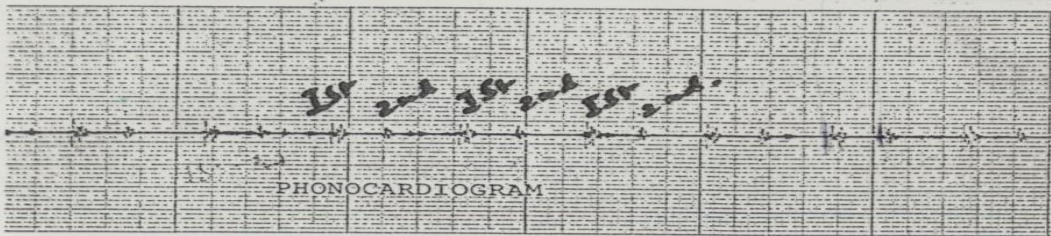
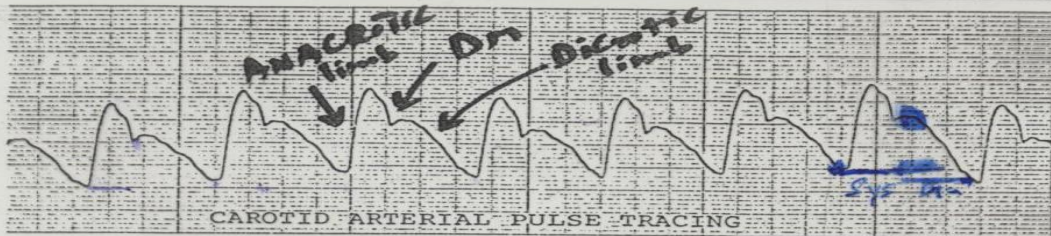
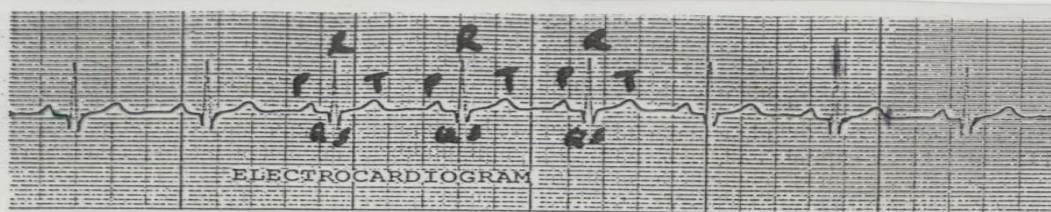
PULSES: Co-relations



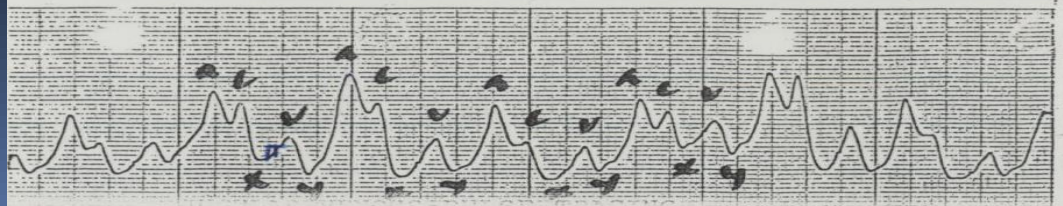
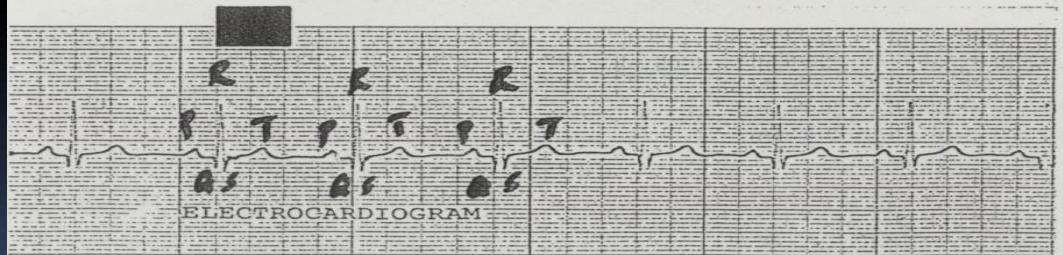
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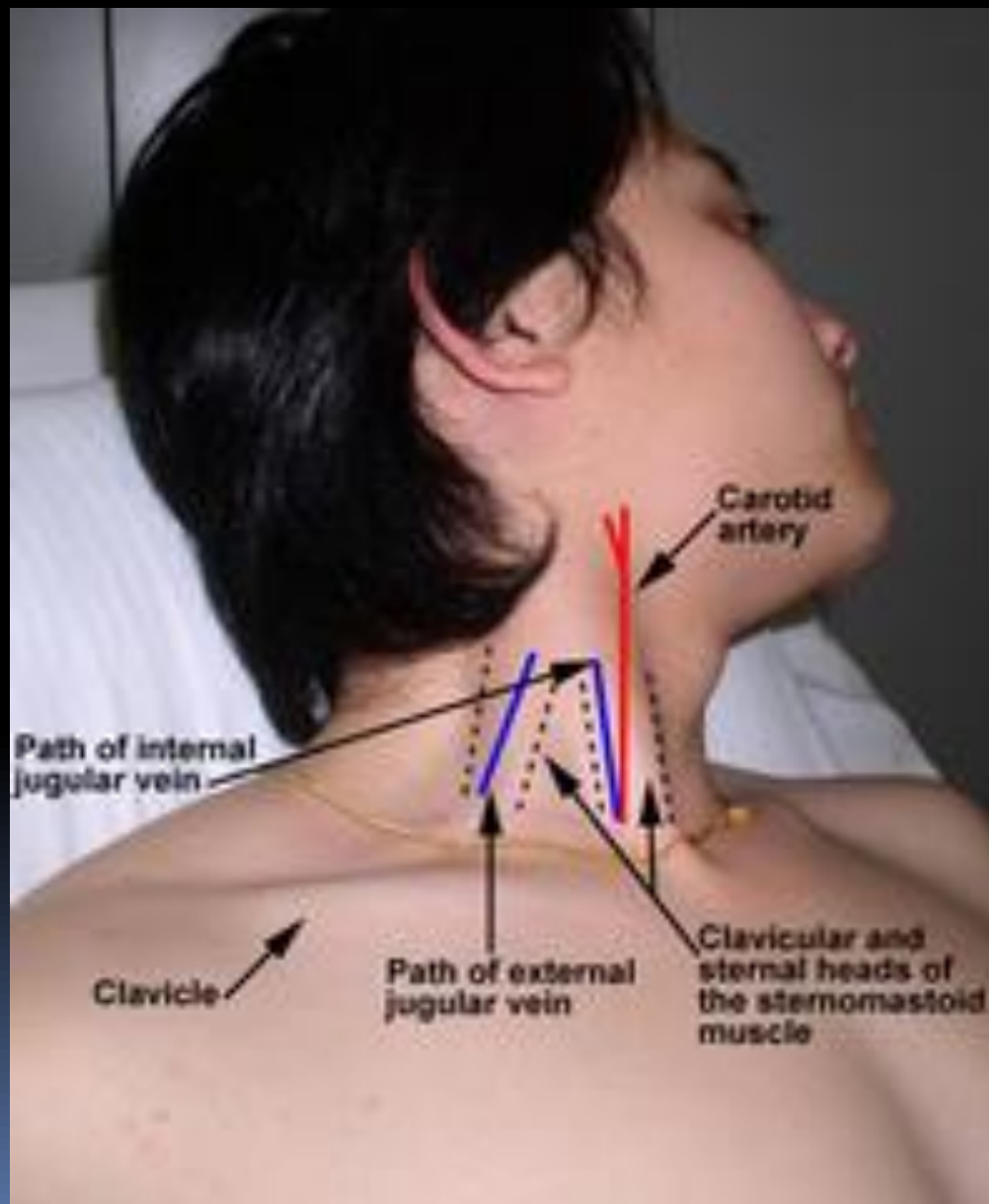
Pulses: Co-relations



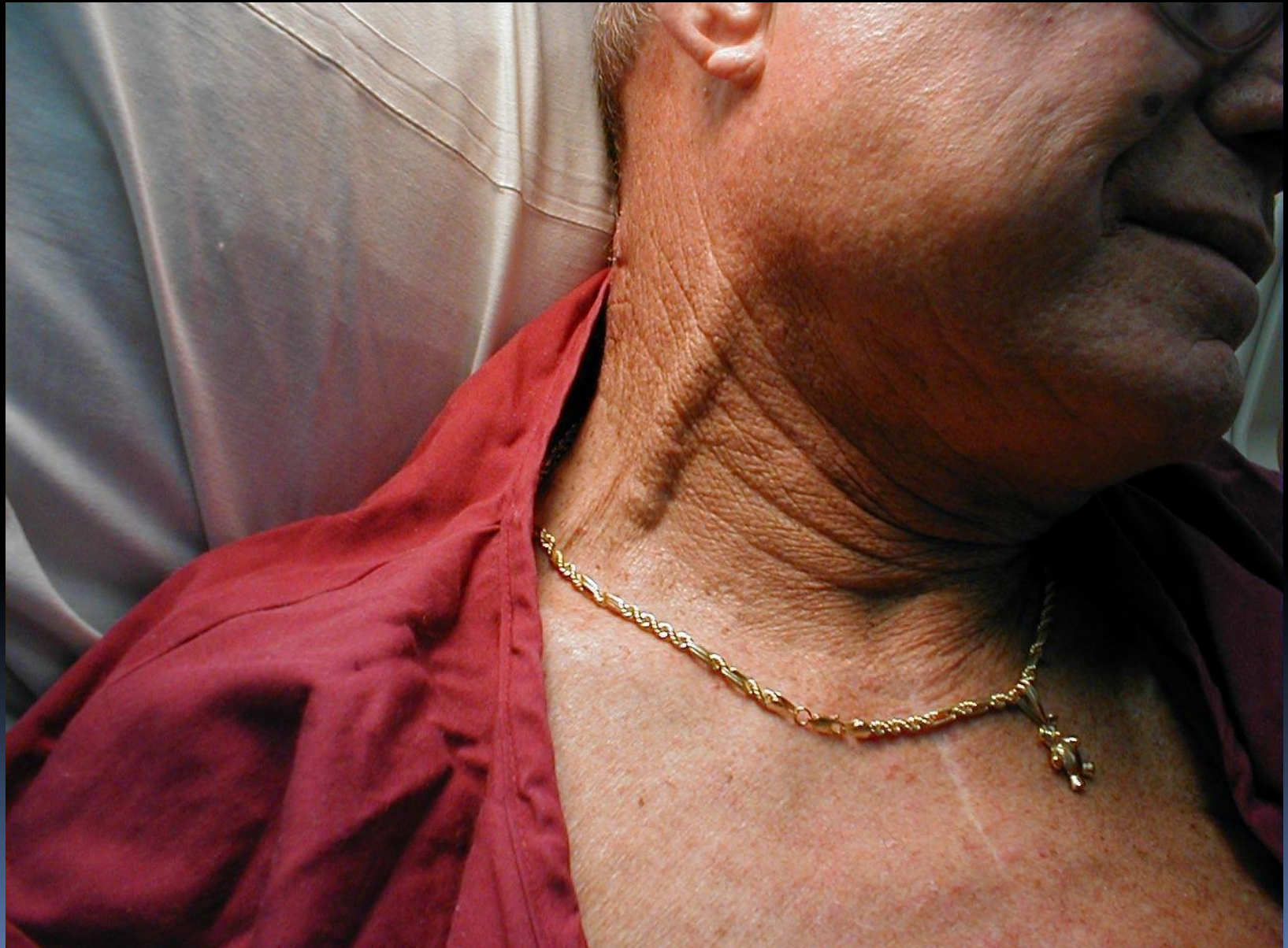
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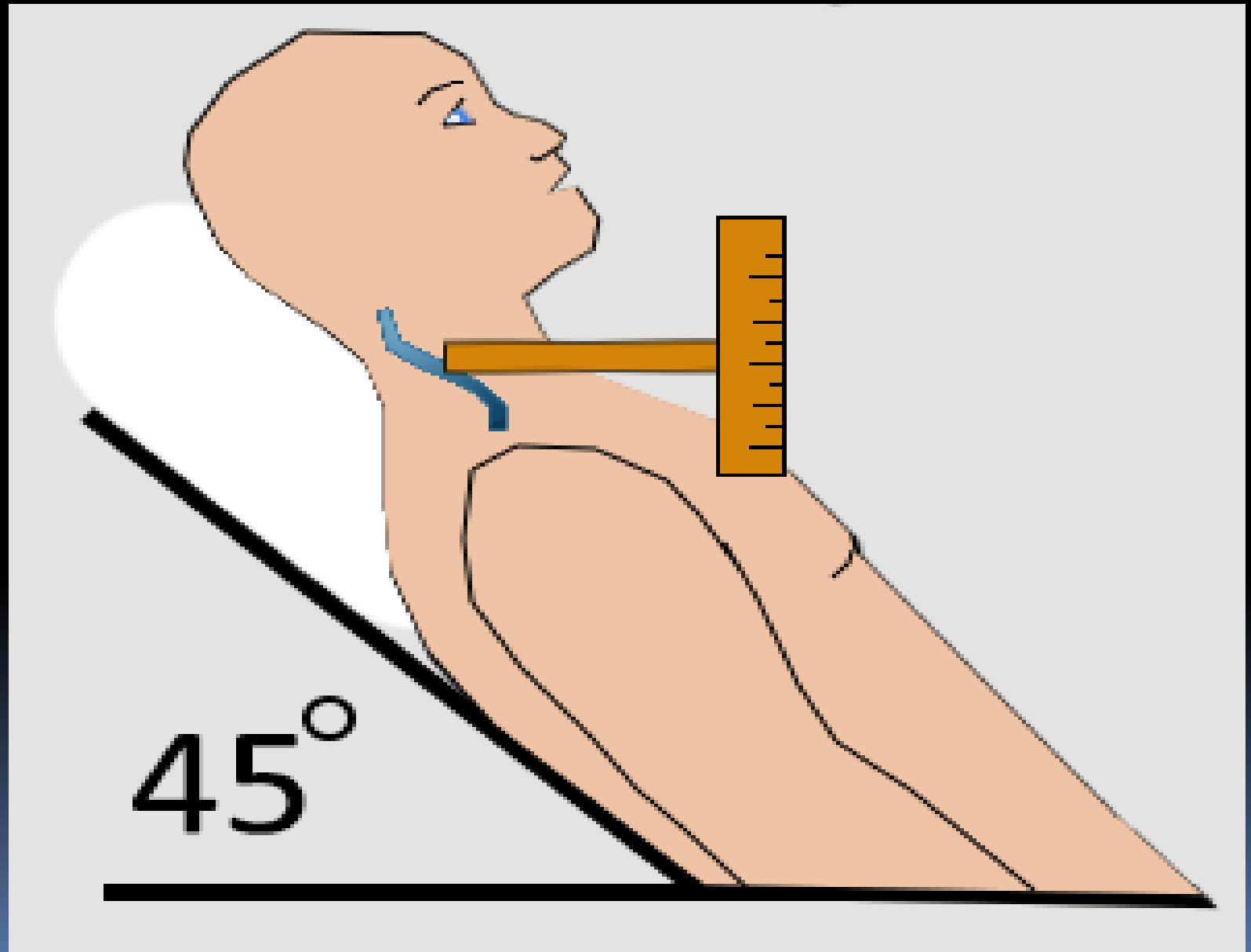
JVP: Method and position of Measurement



JVP: Raised



JVP: Method of Measurement





Thank you