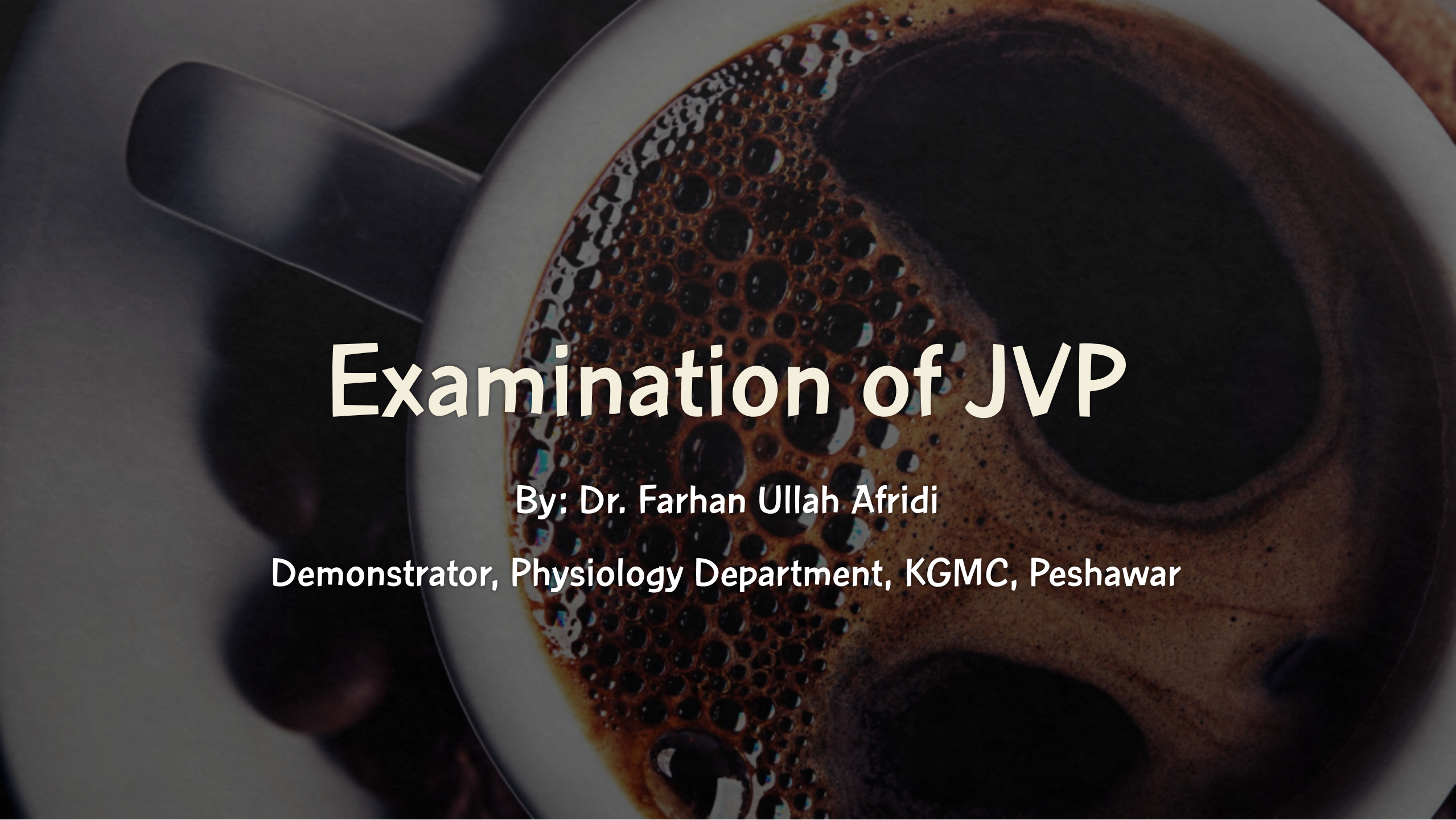

Examination of JVP

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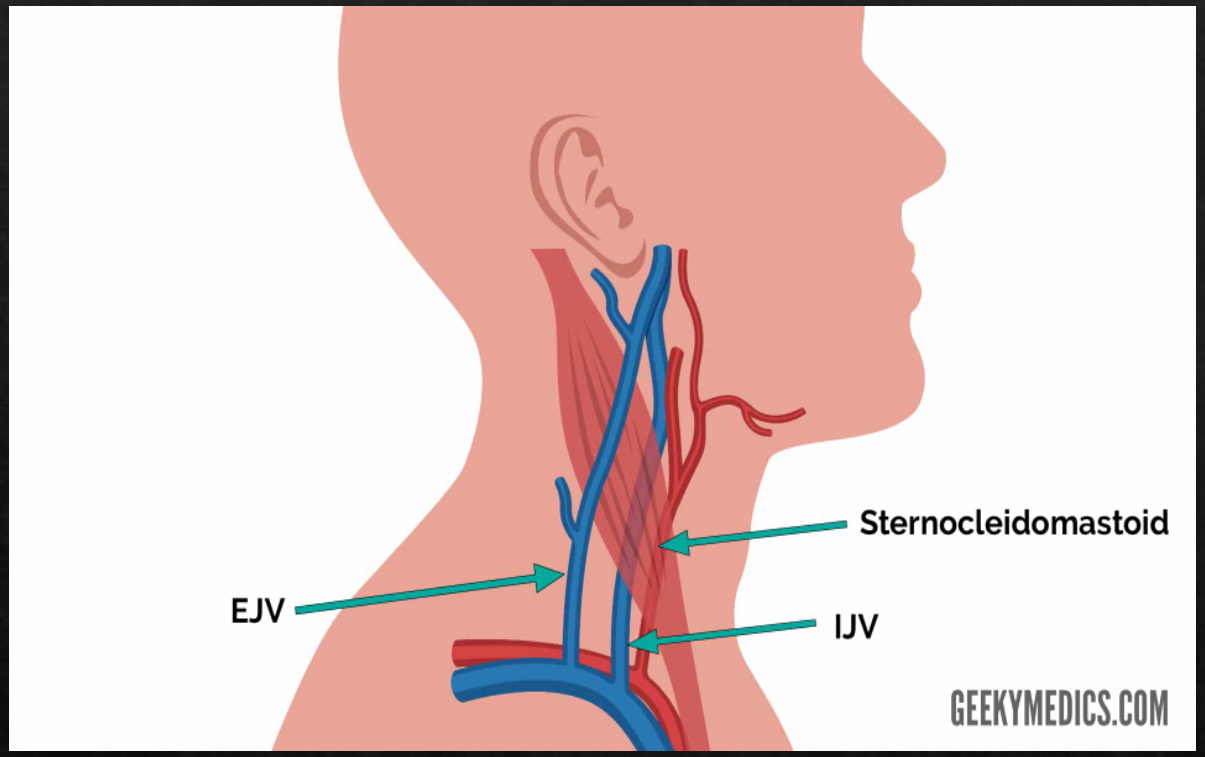
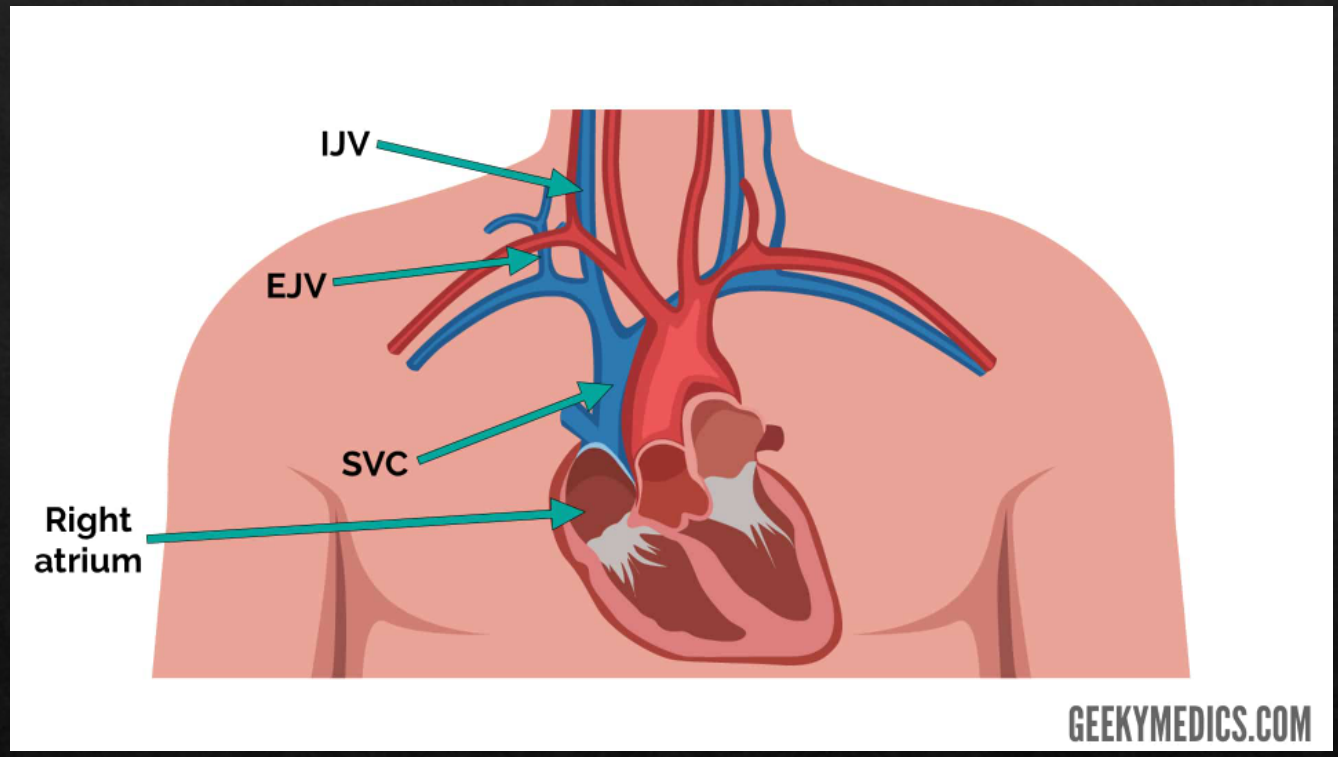
What is JVP

- Vertical height of oscillating column of blood in the Right **INTERNAL** Jugular Vein
- Provides an **indirect** measure of Central Venous Pressure.
- IJV connects to the RA (via SVC) without any intervening valves, resulting in a continuous column of blood
- Changes in RAP are reflected in the IJV (e.g. raised RAP results in distension of the IJV).

- The IJV runs between the **medial end of the clavicle** and the **ear lobe**, **under the medial aspect of the sternocleidomastoid**





Why do we assess the JVP?

- Provides insight into the patient's **fluid status** and **central venous pressure**.

- If a patient is hypervolemic the JVP will appear raised due to increased venous pressure within the right atrium causing a higher than normal column of blood within the IJV.

How to locate IJV

- Differences between the venous pulsation of the JVP and the arterial pulsation of the carotid artery include:

- **Number of pulses**: the JVP has a **double waveform pulse** (i.e. 2 pulses) whereas the carotid artery has a single pulsation for each cardiac cycle.

- **Palpability**: the pulse of the JVP is **not palpable**, whereas the carotid pulse is typically easy to feel.
- The double waveform pulsation associated with the JVP reflects pressure changes within the right atrium.

How to assess JVP

- 1. Position the patient in a semi-recumbent position (at 45°).

- 2. Ask the patient to turn their head slightly to the left.

- 3. Inspect for evidence of the IJV, running between the medial end of the clavicle and the ear lobe, under the medial aspect of the SCM (it may be visible just above the clavicle between the sternal and clavicular heads of the sternocleidomastoid).

  The IJV has a double waveform pulsation, which helps to differentiate it from the pulsation of the external carotid artery.

- If possible, have a tangential light source that shines obliquely from the left

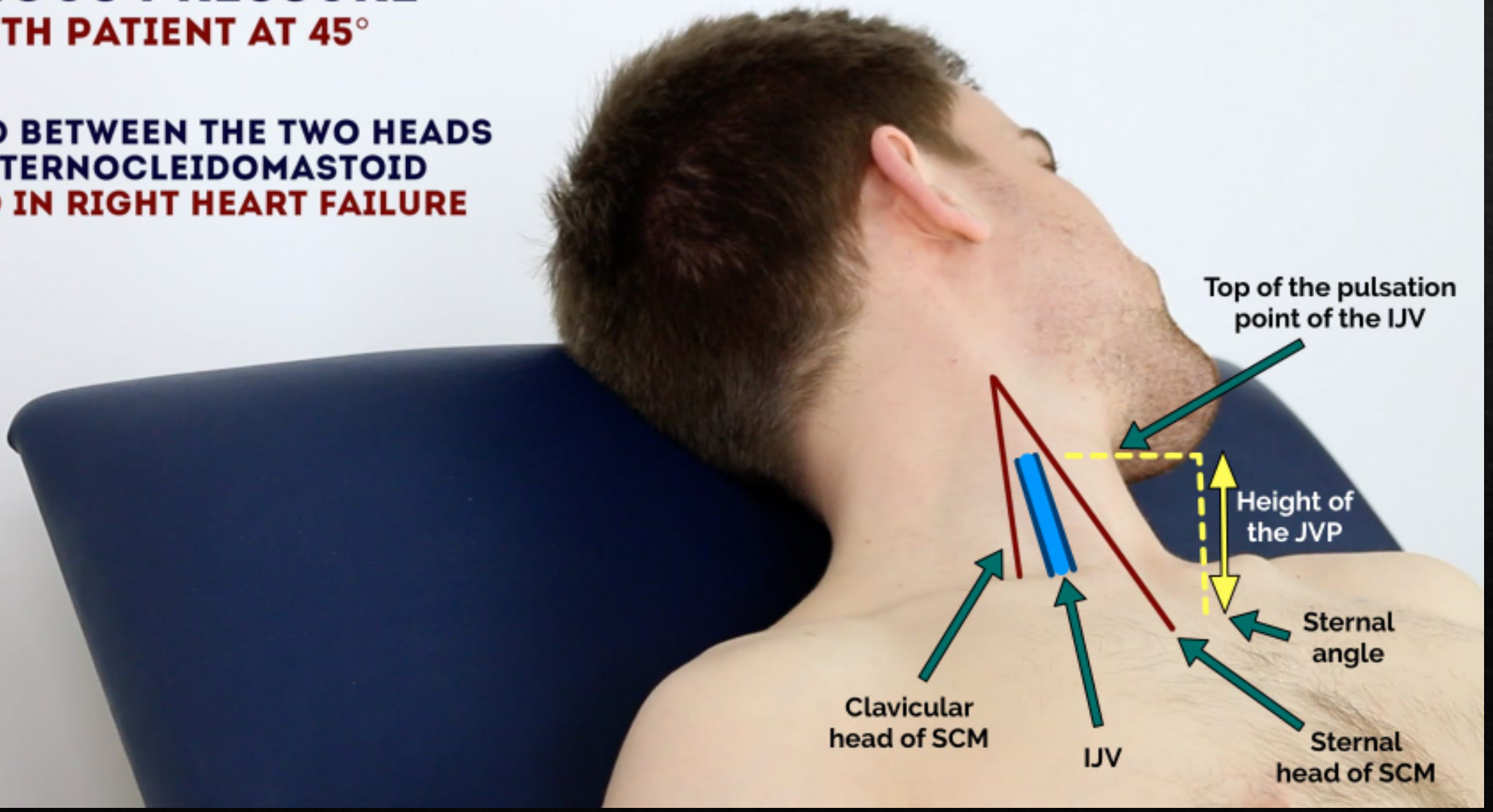
- 4. Measure the JVP by assessing the **vertical distance between the sternal angle and the top of the pulsation point of the IJV** (in healthy individuals, this should be **no greater than 3cm**).

ASSESS JUGULAR VENOUS PRESSURE

WITH PATIENT AT 45°

LOCATED BETWEEN THE TWO HEADS OF STERNOCLEIDOMASTOID

RAISED IN RIGHT HEART FAILURE



- Add 5 cm to the measurement as RA is 5 cm below the sternal angle

- Normal value of JVP 8cm H2O

Differentiate a jugular venous pulse from the carotid pulse

- Not palpable.
- Obliterated by pressure.
- Characterized by a double waveform.
- Varies with respiration - **decreases with inspiration**.
- Enhanced by the **hepatojugular reflux.**

Hepatojugular reflux test

- Application of pressure to the liver whilst observing for a sustained rise in JVP. Used to further assess the JVP, particularly if you are unsure if the vessel you are observing is IJV.
- Position the patient in a semi-recumbent position (45º).
- Apply direct pressure to the liver.
- Closely observe the IJV for a rise.


1. APPLY PRESSURE TO THE LIVER
2. OBSERVE FOR A RISE IN THE JVP
POSITIVE RESULT = SUSTAINED RISE ≥ 4CM
GEEKY MEDICS

Causes of a raised JVP

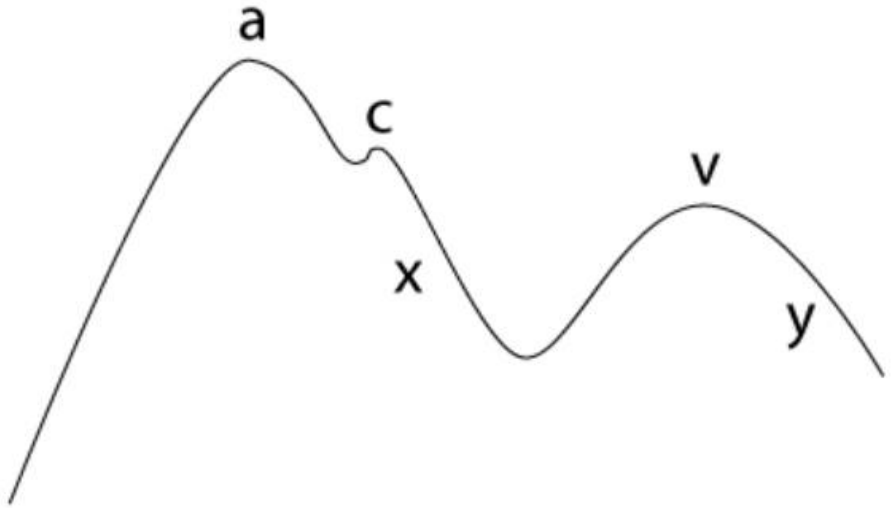
A raised JVP indicates the presence of venous hypertension. Cardiac causes of a raised JVP include:

- **Right-sided heart failure**: due left-sided heart failure, Pulmonary hypertension

- **Tricuspid regurgitation**: causes include infective endocarditis and rheumatic heart disease.
- **Constrictive pericarditis**: often idiopathic, but rheumatoid arthritis and tuberculosis are also possible underlying causes.

Understanding the Jugular Venous Waveform

- There are two positive waves 'a' and 'v', one occurring just before the first heart sound or the carotid impulse, and one just after.



Stanford Medicine 25

"A" wave: atrial contraction (ABSENT in atrial fibrillation)

"C" wave: ventricular contraction (tricuspid bulges). YOU WON'T SEE THIS

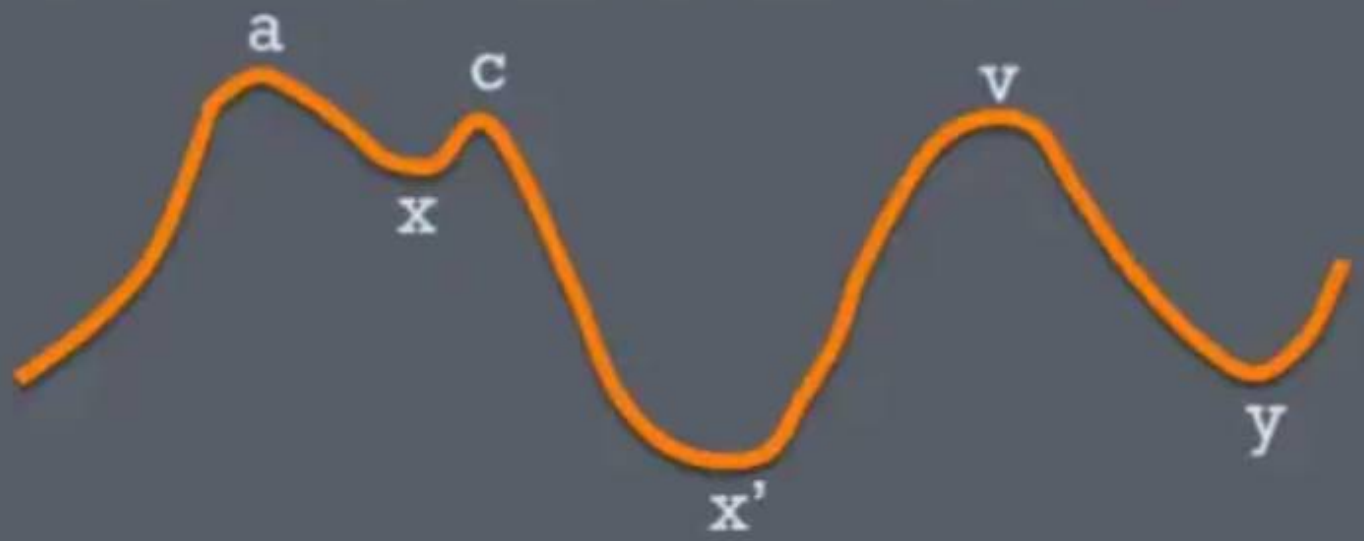
"X" descent: atrial relaxation

"V" wave: atrial venous filling (occurs at same of time of ventricular contraction)

"Y" descent: ventricular filling (tricuspid opens)

JVP

The Normal Waveform



a – atrial contraction

x – atrial relaxation

c – bulging of tricuspid valve with ventricular contraction

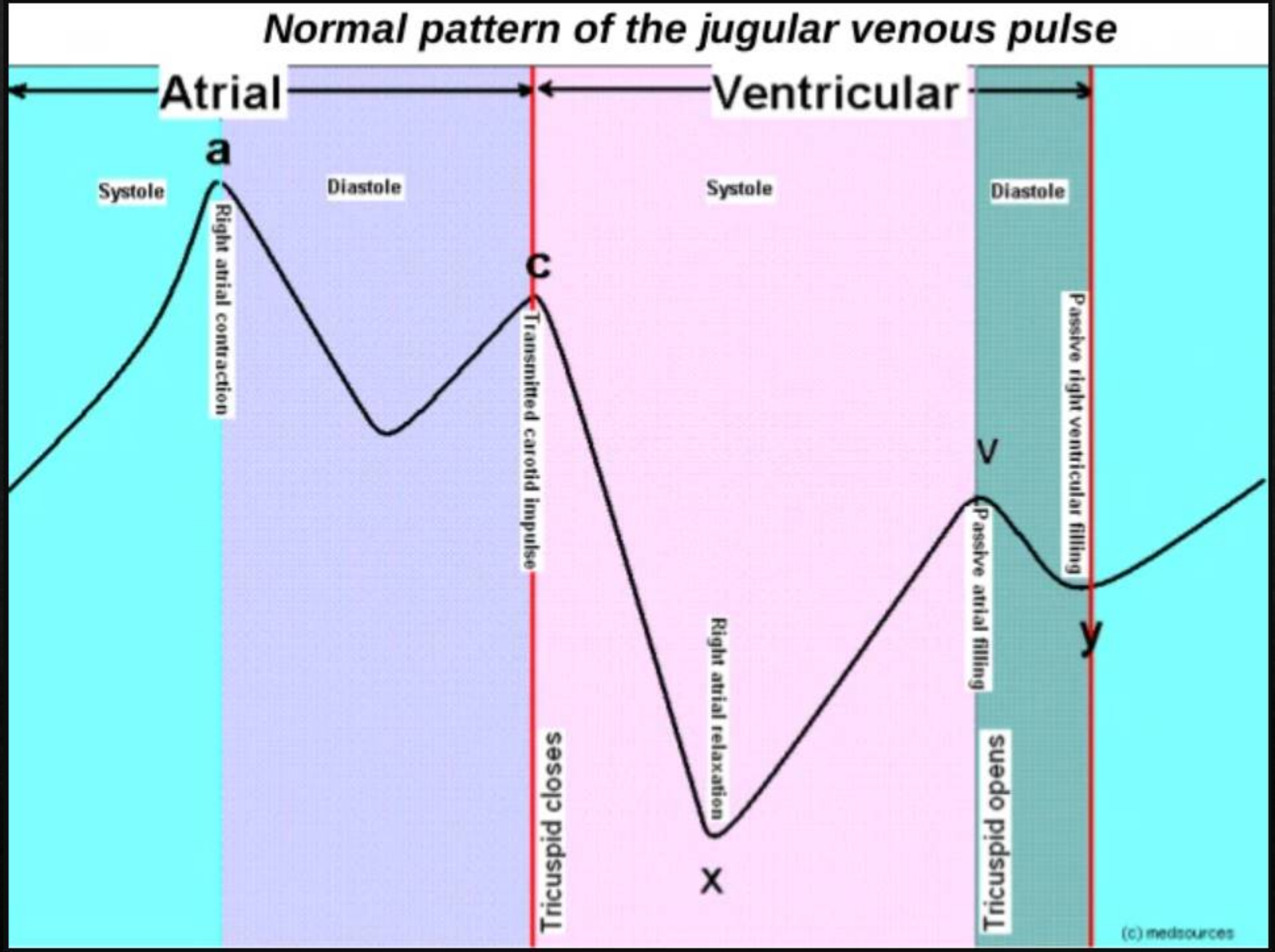
x' – downward movement of tricuspid valve with ventricular contraction

v – passive atrial filling

y - atrial emptying with opening of the tricuspid valve

a-c-v waves

x-y descents


Normal pattern of the jugular venous pulse
Atrial
Ventricular
a
c
v
x
y
Systole
Diastole
Systole
Diastole
Right atrial contraction
Transmitted carotid impulse
Tricuspid closes
Right atrial relaxation
Passive atrial filling
Passive right ventricular filling
Tricuspid opens
(c) medsources

Abnormal Jugular Venous Waveforms

- **Elevated "a" wave**:
  Resistance to right atrial emptying, may occur at or beyond the tricuspid valve. Examples include: **Pulmonary Hypertension; Tricuspid stenosis**

- **Cannon "a" wave**:
  Large positive venous pulse during "a" wave. It occurs when an atrium contracts against a closed tricuspid valve during AV dissociation. Examples include:

Premature atrial/junctional/ventricular beats; Complete atrio-ventricular (AV) block; VT

- **Absent "a" wave**: **No atrial contraction, common to atrial fibrillation.**

- **Elevated "v" wave**: **Tricuspid regurgitation is the most common cause**

- **Neck veins rise in inspiration rather than fall**

Kussmaul sign

Failure of decline in JVP occur during inspiration.

- Constrictive Pericarditis
- Severe RHF
- Restrictive Cardiomyopathy
- Tricuspid Stenosis

Thank You