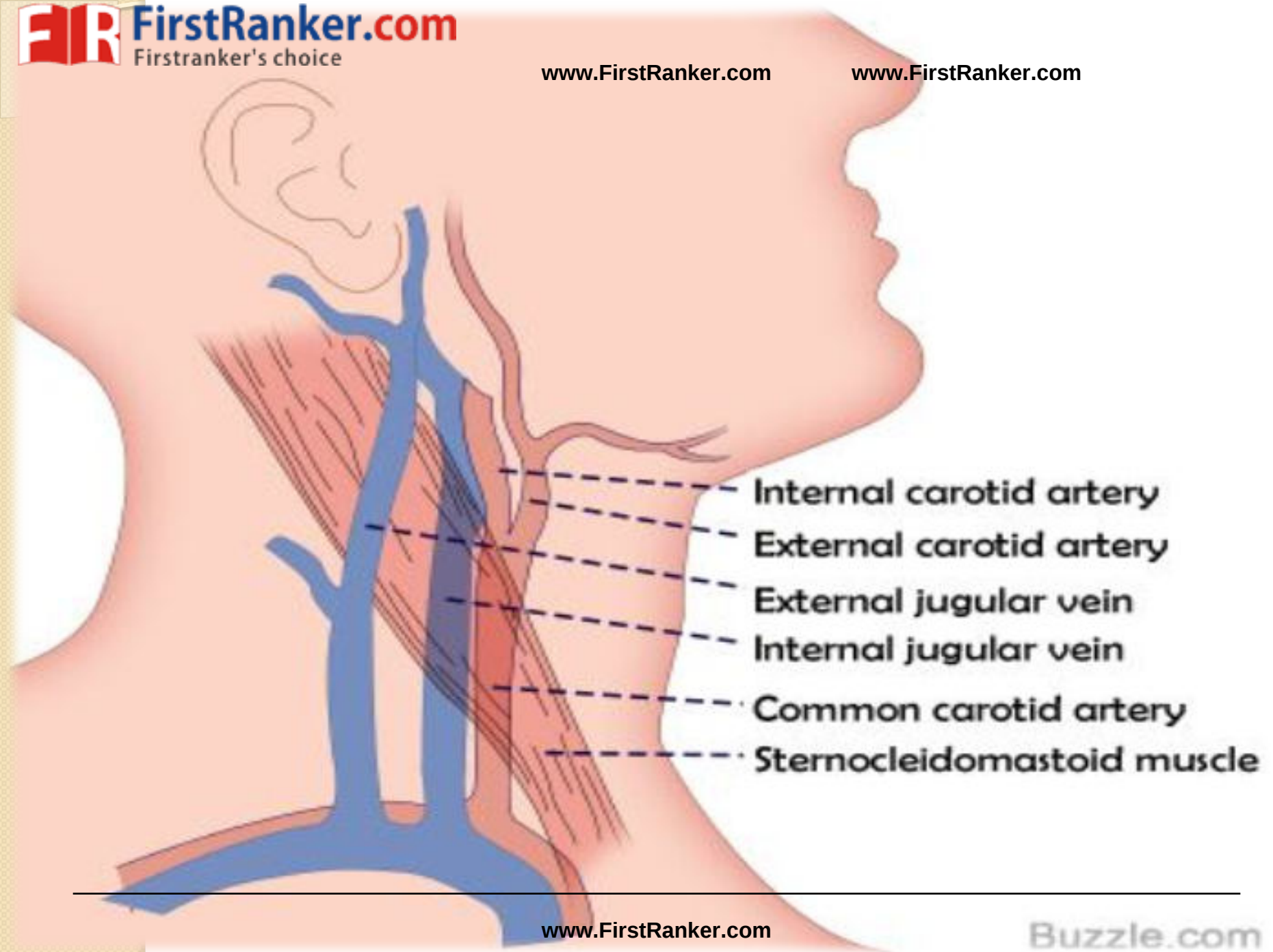
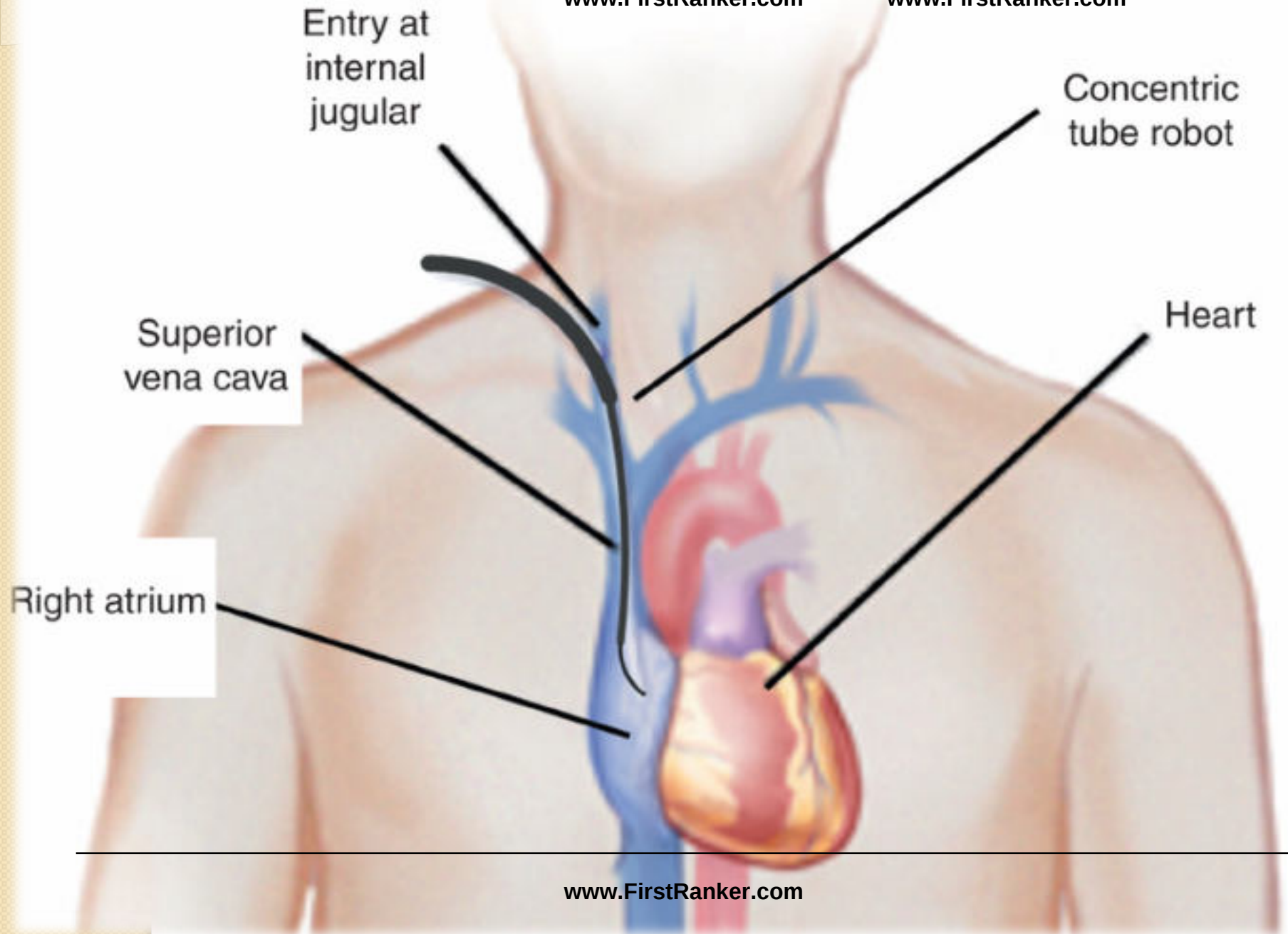


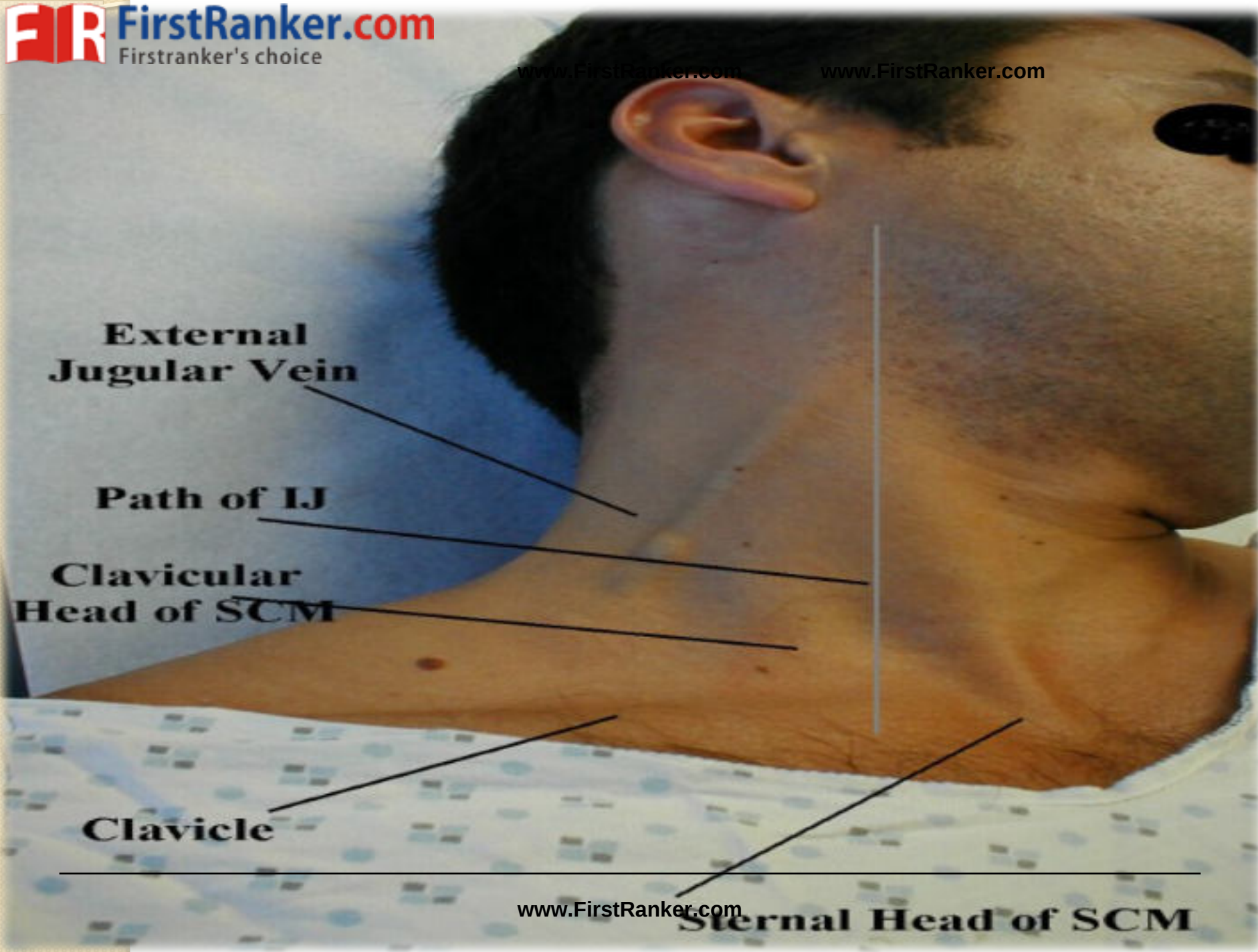
Jugular venous pulse is the oscillating top of the distended proximal portion of the internal jugular vein and represents volumetric changes that reflect the pressure changes in the right heart.

ANATOMY

- The internal jugular vein runs deep to the sternocleidomastoid muscle and enter the thorax between the sternal and clavicular heads.
- The external jugular vein is more superficial and prominent.







Right IJV Preferred

- Straight line course through innominate vein to the svc and right atrium
- Less likely extrinsic compression from other structures in neck

Why not EJV

- No or less numbers of valves in IJV than EJV

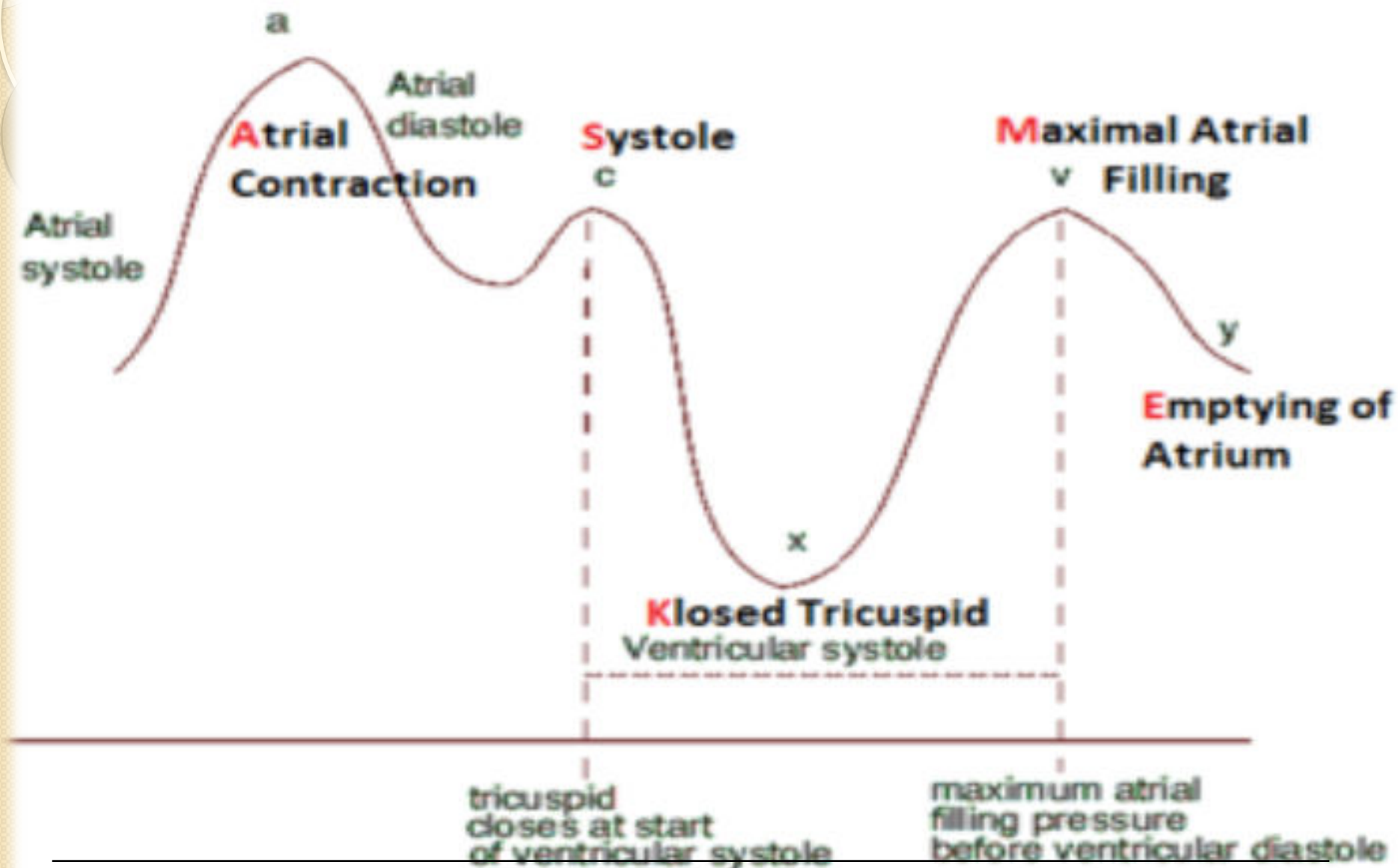
The JVP level reflects right atrial pressure (normally less than 7 mmHg). The sternal angle is approximately 5 cm above right atrium, so the JVP should be normally less than or equal to 4 cm above this angle when the patient lies at 45 degrees.

NORMAL JVP

Normal JVP reflects phasic pressure changes in right atrium during systole and right ventricle during diastole.

Normal JVP waveform consists of

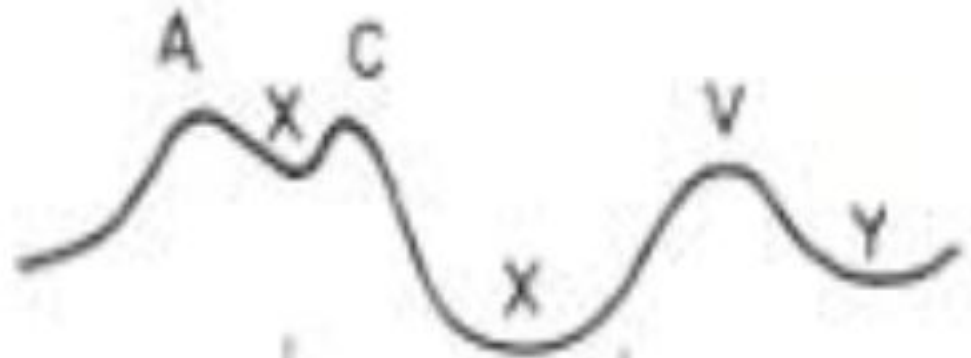
- 3 positive waves –a ,c and v
- 3 descents –x ,x' and y



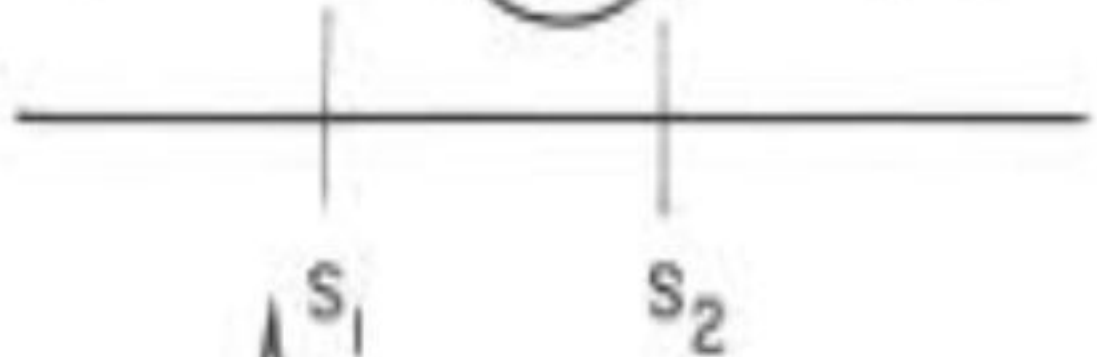
CAROTID PULSE



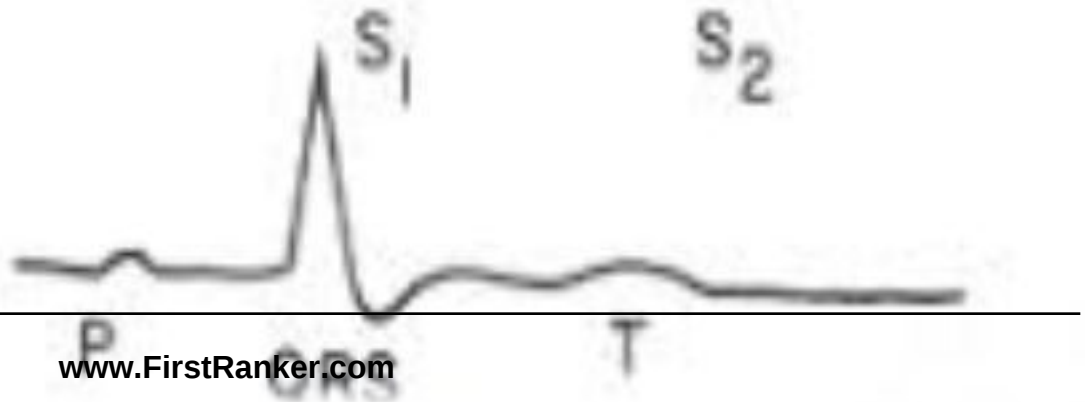
VENOUS PULSE



HEART SOUNDS



EKG



DIFFERENCES BETWEEN JVP AND CAROTID PULSE

- Superficial and lateral in the neck
- Better seen than felt
- Has two peaks and two troughs
- Descents > obvious than crests
- Digital compression abolishes venous pulse
- Jugular venous pressure falls during inspiration
- Abdominal compression elevates jugular pressure

Deeper and medial in the neck

Better felt than seen

Has single upstroke only

Upstroke brisker and visible

Digital compression has no effect

Do not change with respiration

Abdominal compression has no effect on carotid pulse

a Wave

- First positive presystolic a wave is due to right atrial contraction.
- Effective right atrial contraction is needed for visible a wave.
- Dominant wave in JVP and larger than v
- It precedes upstroke of carotid pulse and SI, but follow the P wave in ECG

x Descent

- Systolic x descent is due to atrial relaxation during atrial diastole.
- X descent is the most prominent motion of normal JVP which begins during systole and ends just before S2.
- It is larger than y descent.
- X descent is more prominent during inspiration

c Wave

- Not usually visible.
- Causes-
 - Transmitted carotid artery pulsation.
 - Upward bulge of closed tricuspid valve in isovolumic systole.

x' Descent

- Systolic trough after c wave.
- Due to fall of the right atrial pressure during early right ventricular systole
- Downward pulling of the tricuspid valve by contracting right ventricle.
- Descent of right atrial floor

v Wave

- Begins in late systole and ends in early diastole
- Cause- rise in RA pressure due to continued right atrial filling during ventricular systole when tricuspid valve is closed.
- Roughly synchronous with carotid upstroke and corresponds to S2.

y descent

- Diastolic collapse wave(down slope v wave)
- It begins and ends during diastole well after S2
- Cause-decline of right atrial pressure due to right atrial emptying during early diastole when tricuspid valve opens

h Wave

- Small brief positive wave following y descent just prior to a wave
- Usually seen when diastole is long
- With increasing heart rate , y descent is immediately followed by a wave

RESPIRATORY INFLUENCES

- Inspiration- increased visibility of venous pulse
- Waves become more prominent during inspiration
- X descent more brisk
(due to increased venous return).