physical Examination

Assessing Consciousness

Glasgow Coma Scale

- Assesses patient's neurological condition
- Value range 3 to 15
- 3 totally comatose patient
- 15 fully alert patient

Glasgow Coma Scale

3 parameters

- Eye opening
- Verbal response
- Motor response

Eye opening

- Spontaneous = 4
- To speech = 3
- To pain = 2
- None = 1

Verbal response

- Orientated = 5
- Disorientated = 4
- Monosyllabic = 3
- Incomprehensive = 2
- None = 1

Motor response

- Obeys commands = 6
- Localises pain = 5
- Withdrawal to pain = 4
- Flexion to pain = 3
- Extension to pain = 2
- None = 1

Chest Causes of decreased conscious level

- TB meningitis
- Bronchogenic carcinoma
  - brain metastases
  - paraneoplastic manifestations
- Respiratory failure

Problems of decreased conscious levels

- Inability to protect airway – loss of cough and gag reflexes

- Increased risk of aspiration
  - aspiration pneumonia
  - lung abscess
  - FB aspiration

Decubitus & Attitude

Decubitus & Attitude

- Orthopnea
- Platypnea
- Trepopnea
- Prayer attitude

Orthopnea

- *Dyspnea on laying down relieved by sitting*
- Causes:
  1. *Cardiac* – Lt sided heart failure
  2. *Respiratory* – bil. apical lung disease
     - COPD
     - Acute severe asthma
  3. *Extrathoracic* – Tense ascites

Orthopnea

Platypnea

- *Platypnea* refers to breathlessness that occurs in the upright position and is relieved with recumbency.

- Causes: *bil basal lung disease* e.g.
  basal AV malformations,
  basal intrapulmonary shunts in HPS

Trepopnea

- *Trepopnea* is dyspnea that occurs in one lateral decubitus position as opposed to the other.
- Causes: unilateral lung diseases e.g.
  - collapse
  - destroyed lung
  - pleural effusion
  - lung abscess and pneumonia

prayer position

- Mohamed prayer position (leaning forward) $\rightarrow$
  - pericardial effusion and
  - mediastinal tumors.

Built & Nutritional State

Built & Nutritional State

- *Skin fold (indicator of fat)*

  suprapubic = ½ inch

  subscapular = 1 inch

  triceps = 1½ inches

- *Mid arm circumference* (indicator of muscle mass)

- *Body mass index:* BMI

Body mass index

- The body mass index formula is:
  BMI = Weight (in kg)/ Height (in m)^2
- ***Underweight*** ***<18.50***
- ***Normal range*** ***18.50 - 24.99***
- ***Overweight*** ***25.00 – 29.99***
- ***Obese*** ***>=30.00***

Obesity & Chest

- *Obesity is associated with :*

  - restrictive lung function.

- *Obesity is a major risk factor for :*

  - obstructive sleep apnea
  - pulmonary embolism
  - aspiration pneumonia
  - post operative pulmonary complications

Vital Signs

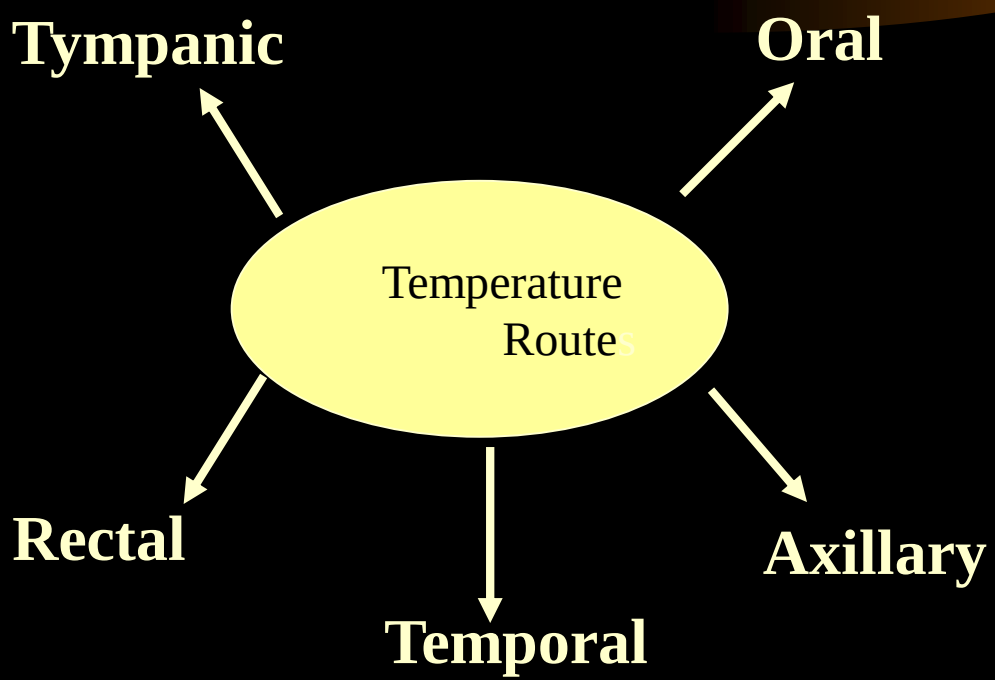
Vital signs

- **Temperature**
- **Pulse**
- **Respirations**
- **Blood pressure**
- **Oxygen saturation**

Vital Signs: Temperature

- Normal range from 36.6 to 37.2 °C.
- It is measured through
  - the oral,
  - axillary (add ½ degree)
  - rectal (subtract ½ degree)
  - tympanic
  - or temporal routes

Vital Signs: Temperature (cont.)




ORAL TEMP.

Vital Signs: Temperature (cont.)

- Normally, every rise of 1 °C increases pulse by 10-15 b/m.
- Tachycardia out of proportion to rise of temperature in:
  - Rheumatic carditis.
  - Diphtheria (due to toxic myocarditis).
  - Viral myocarditis.

Vital Signs: Temperature (cont.)

- Slower heart rate than expected for a given temperature:(*Relative Bradycardia*)
  - Typhoid fever.
  - Meningitis.
  - Viral infections
  - Drug induced e.g. b blockers
  - Mycoplasma pneumonia

Vital Signs: Temperature (cont.)

The course of fever is described as:

1. Continuous fever:
2. Remittent fever:
3. Intermittent fever:
4. Relapsing fever:

Vital Signs: Temperature (cont.)

1. ***Continuous fever:***

temperature always high and doesn't fluctuate more than 1 °C in 24 hours

e.g pneumonia

& 2nd week of typhoid.

Vital Signs: Temperature (cont.)

2. ***Remittent fever:***

temperature always high but variation between morning and evening is bigger than 1 °C

e.g. empyema

and T.B.

Vital Signs: Temperature (cont.)

3. ***Intermittent fever:***

fever occurs in bouts of several days alternating with afebrile periods

e.g. malaria

& collagen diseases.

Vital Signs: Temperature (cont.)

4. ***Relapsing fever:***

short periods of fever alternating with short periods of normal temperature.

Vital signs: Blood Pressure

- Normal B.P. varies with age
- The maximum normal for middle-aged subject is 140/90. *(90-140/60-90)*
- Normally, 5% of the population has hypotension (systolic B.P. below 90 mmHg).

Vital signs: Blood Pressure

- Hypotension can occur in:

- Septic shock (SIR + source of infection + hypotention)
  e.g. severe pneumonia
- Neurogenic shock - e.g. Needling procedure
  fibreoptic bronchoscopy
- Massive pulmonary embolism
- Tension pneumothorax
- Massive hemoptysis e.g. TB, bronchiectasis, tumor
- Carcinoid syndrome (flushing, diarrhea and hypotension)

Vital signs: Pulse

- Rate
- Rhythm
- Special character
- Volume
- Equality in both sides
- Arterial wall state
- Peripheral pulsations

Vital signs: Pulse (cont.)

Rate:

- Normal rate 60-100 b/m.
- Tachycardia → if more than 100 b/m.
- Bradycardia → if less than 60 b/m.

Vital signs: Pulse (cont.)

- *<u>Pulmonary causes of tachycardia:</u>*

1. Pneumonia
2. Bronchial asthma
3. Drugs e.g. β agonists, theophyllin
4. Hypoxemia & hypercapnea

Vital signs: Pulse (cont.)

Rhythm:

1. Regular: normal sinus rhythm.
2. Irregular:

Regular irregularity: ventricular premature beats.

Irregular irregularity:

- Atrial fibrillation.
- Multiple ventricular premature beats:

- ✓ **Bigeminy: normal beat followed by a dropped or weak beat.**
- ✓ **Trigeminy: 2 normal beats followed by a dropped beat.**

Vital signs: Pulse (cont.)

Special character:

- **Collapsing pulse** (water hammer pulse):

- Def. : a pulse of sudden upstroke and a sudden down-stroke best felt at the forearm with the arm raised.

- Causes: all causes of hyperdynamic circulation e.g.

- AI	- A-V fistula	- Anemia
- PDA	- Beri Beri	- Pregnancy
- Fever	- Thyrotoxicosis	

- Hypercapnic respiratory failure

Vital signs: Pulse (cont.)

- **Plateau pulse:**

Def.: a pulse with a slow upstroke, low amplitude, a slow down-stroke and a prolonged duration.

- Causes: aortic stenosis (associated with heaving sustained apex).

Vital signs: Pulse (cont.)

Pulsus paradoxus:

- Def.: it is a diminution of the volume of pulse at the end of deep inspiration due to pooling of blood in the pulmonary vessels.
- It occurs normally and the diminution doesn't exceed ***10 mmHg***.
- It is detected by the sphygmomanometer.
- It is usually associated with congested pulsating neck veins in early stages and congested non-pulsating in late stages.
- Causes:- constrictive pericarditis
  - pericardial effusion.
  - acute severe asthma

Vital signs: Pulse (cont.)

Pulsus deficit:

- Def: the apical heart rate is more than the pulse rate and the difference is the deficit.
- Causes:
  - Rapid atrial fibrillation.
  - Multiple ventricular premature beats.

Vital signs: Pulse (cont.)

Pulsus alternans:

- Def: a strong beat followed by a weak beat.

- Causes: left ventricular failure with myocardial infarction.

Vital signs: Pulse (cont.)

Volume:

it is the amplitude of the wave of arterial pulsation and it depends on wide pulse pressure

- Large volume: all causes of arterial pulsations in neck.
- Small volume:
  - All obstructive valvular diseases.
  - Constrictive pericarditis.
  - Pericardial effusion.
  - Rapid arrhythmias.
  - Shock.

0---------- 1+ ----------2+---------- 3+ ----------4+

Absent Weak NORMAL Full Bounding

Vital signs: Pulse (cont.)

Equality: unequal in volume and timing:

- Peripheral embolism.
- Aortic aneurysm.
- Unilateral cervical rib.
- Pancoast's tumor.
- Infantile coarctation of the aorta with PDA (delayed femoral pulse more than radial pulse).

Vital signs: Pulse (cont.)

Peripheral pulsations:

the status of the dorsalis pedis, anterior and posterior tibial, popliteal, femoral, radial, brachial, carotid and superficial temporal arteries.

Diminished peripheral pulsations in:

- Peripheral embolism: acute pain and signs of poor perfusion.
- Coarctation of the aorta.
- Burger's disease (thromboangitis obliterans).
- Extensive atherosclerosis.
- 10% of normal persons have aberrant dorsalis pedis artery.

Vital signs: Respiration

Rate

- Normal rate: 12-20/minute.
- Ratio of pulse to respiration is 4:1.
- In pneumonia ratio 3:1 or less.

Rhythm

Depth

Character

Smell

Vital signs: Respiration (cont.)

Breath:

- Diabetic ketoacidosis → acetone smell.
- Uremia → ammonia smell.
- Hepatic failure → fetor hepaticus (mossy smell).
- Suppurative lung diseases → putrid smell.

Oxygen Saturation

- **Oxygen Saturation** provide important information about cardio-pulmonary dysfunction and is considered by many to be a fifth vital sign.

Colours

Colours

- Pallor
- Jaundice
- Cyanosis

Pallor

- Def: reduced or absence of reddish coloration of mucous membranes and skin
- Detected in:

- Mucus membranes of lips, lower lids (not upper lids because of trachoma)

- Buccal cavity and tongue

- and palms

N.B. White palmar creases = less than 7 gm HB

Pallor (cont.)

- *Pulmonary causes of pallor: Anemia due to*

  - *Recurrent hemoptysis* - *bronchiectasis*
  - *alveolar hemorrage*
  - *recurrent infarctions*
  - *TB*
  - *Bone marrow infiltration* - *bronchogenic CA*
  - *miliary TB*
  - *Malabsorption syndrome* - *cystic fibrosis*
  - *Parasitic infestations.*

Jaundice

- Def. yellowish discoloration of skin, sclera & mucous membrane.
- Clinically, it occurs when bilirubin level ≥ 3mg/dl
- Chest causes:

- *Hemolytic jaundice*	- pulmonary infarction
	- mycoplasma pneumonia
- *Hepatocellular jaundice*	- core pulmonale
	- anti TB drugs
- *Obstructive jaundice*	- metastases to porta hepatis LN

Cyanosis

- *Def.* It is bluish discoloration of the skin and mucus membranes due to raised level of reduced hemoglobin in capillaries more than 5 gm% (normally 1-2 gm%).
- *Types:*
  - Central cyanosis
  - Peripheral cyanosis

Central cyanosis

Hypoxemic hypoxia:

- Decreased inspired FiO2 (high altitude)
- Hypoventilation (respiratory center depression)
- Shunt (pneumonia, pulmonary edema, AV malformations, cyanotic heart diseases)
- V/Q mismatch(COPD, asthma, pulmonary embolism)
- Diffusion defect (IPF)

Histotoxic hypoxia:

- Cyanide poisining

Affinty hypoxia:

- Methemoglobinemia - sulfhemoglobinemia

Peripheral cyanosis

1- Left sided heart failure.

2- Peripheral vascular diseases:

- Raynaud's disease.
- Burger's disease.

3- Cold weather.

Cyanosis (cont.)

		Central cyanosis	Peripheral cyanosis
1-	**Site:**	**Under surface of tongue**	**Extremities: hands, nose and nail bed**
2-	**Temperature:**	**Hot (peripheral vasodilatation)**	**Cold (peripheral vasoconstriction)**
3-	**Clubbing:**	**Present**	**Absent**
4-	**$O_{2\ \%}$:**	**Below 80%**	**Normal**
5-	**O_2 therapy:**	**Improves cyanosis due to lung disease only**	**No improvement of cyanosis**

Head & Neck Examination

Horner's syndrome

- Unilateral ptosis, miosis, anhydrosis and enophthalmos
- Causes:
  - Pancoast tumor
  - Mediastinal LN +++

Puffy eyelids:

- Chronic cough (commonest cause).
- Renal diseases.
- Mediastinal syndrome.
- SVC thrombosis.
- Myxedema.
- Angioneurotic edema.
- Nutritional edema (hypoproteinemia).

Pigmentation in butterfly area of face:

- MS (malar flush)(red).
- SLE (red).
- Pellagra (brownish).
- Pregnancy (brownish).

Lymph nodes:

- Site, consistency, borders, tenderness, matted or discrete and the presence or absence of sinuses.
- Other lymph node enlargement e.g. axillary, inguinal or mediastinal
- *If present, Check for:*

Liver and spleen enlargement.

Purpuric rash.

Sternal tenderness.

Bleeding tendency.

Fever.

Important causes of lymphadenopathy are:

- Lymphoma.
- Leukemia.
- Infections.
- Tuberculosis.
- Secondaries.
- Hodgkin’s disease.
- Local causes as tonsillitis.

Neck Vein Examination

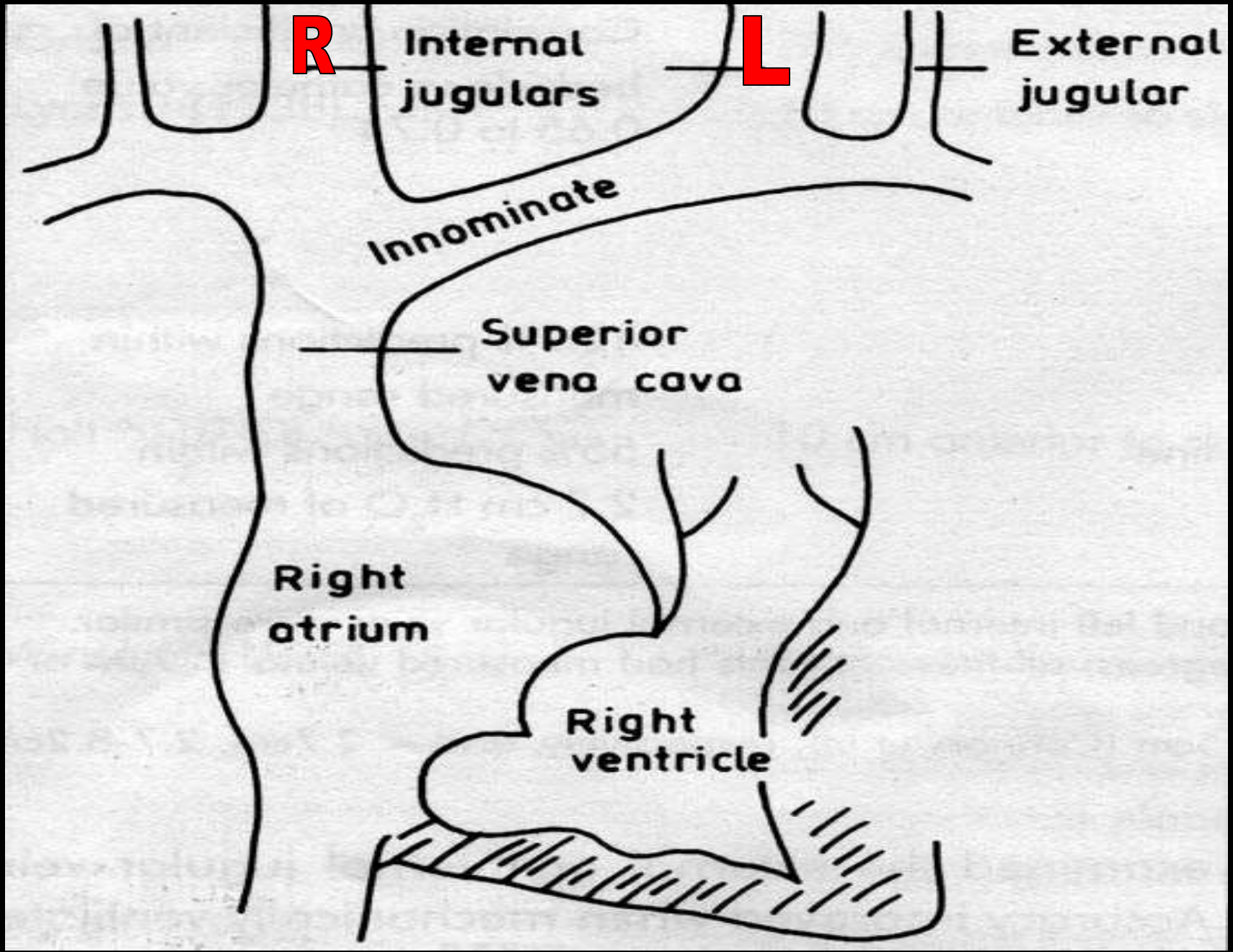
Why Internal Jugular Vein?

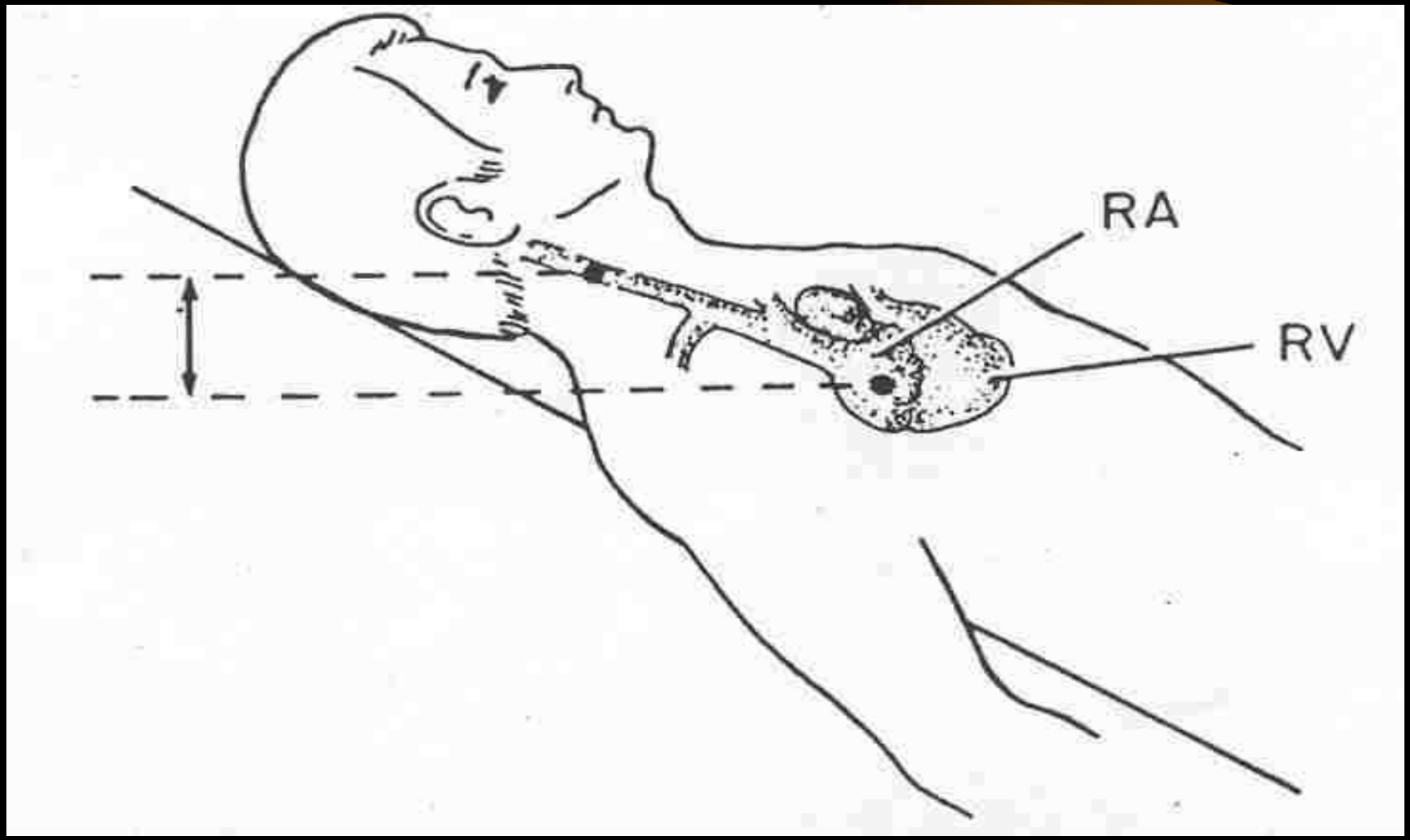
- IJV has a direct course to RA.
- IJV is anatomically closer to RA.
- IJV has no valves(Valves in EJV prevent transmission of RA pressure)
- Vasoconstriction Secondary to hypotension (in CCF) can make EJV small and barely visible.

Why Right Internal Jugular Vein?

- Right jugular veins extend in an almost straight line to superior vena cava, thus favouring transmission of the haemodynamic changes from the right atrium.

- The left innominate vein is not in a straight line and may be kinked or compressed between Aortic Arch and sternum, by a dilated aorta, or by an aneurysm.


R
Internal jugulars
L
External jugular
Innominate
Superior vena cava
Right atrium
Right ventricle


RA
RV

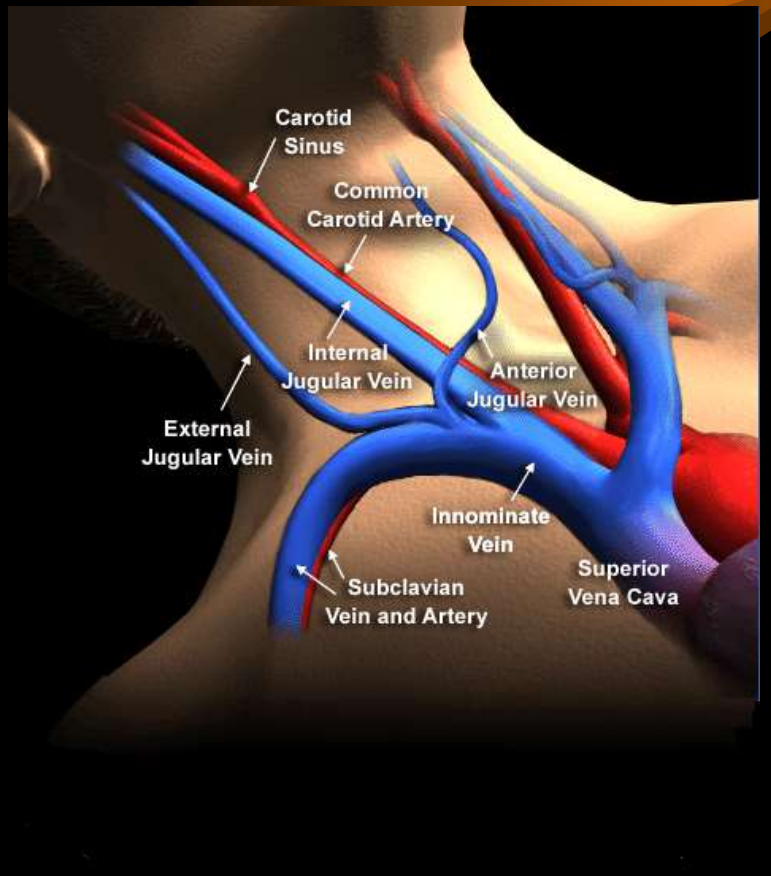
Neck pulsations:

	Arterial Pulsations	*Venous Pulsations*
1-	Not obliterated on pressure	Obliterated on pressure
2-	Single wave	Wavy (A and V waves)
3-	Synchronous with heart beat	V wave synchronous and A wave asynchronous with heart beat
4-	In anterior triangle of neck (medial to sternomastoid)	In posterior triangle of neck (lateral to sternomastoid)
5-	Easily felt than seen	Easily seen than felt
6-	No effect with respiration	Change with respiration
7-	Don’t change with position	Change with position

Method Of Examination

- The patient should lie comfortably during the examination.
- Clothing should be removed from the neck and upper thorax.
- Patient reclining with head elevated 45 °
- Neck should not be sharply flexed.
- Examined effectively by shining a light tangentially across the neck.
- There should not be any tight bands around abdomen

JVP Inspection



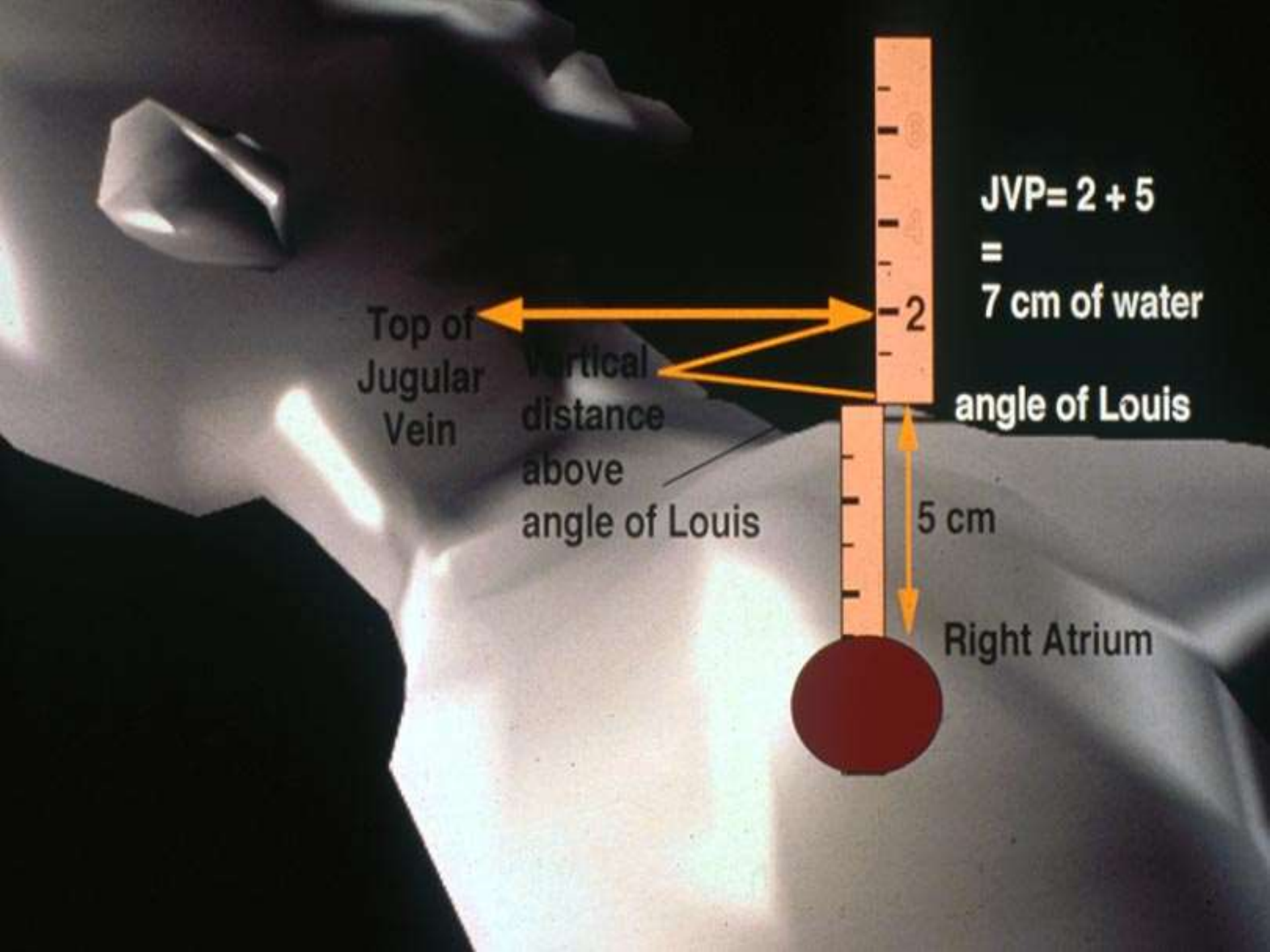
Observations Made

- the level of venous pressure.
- the type of venous wave pattern.

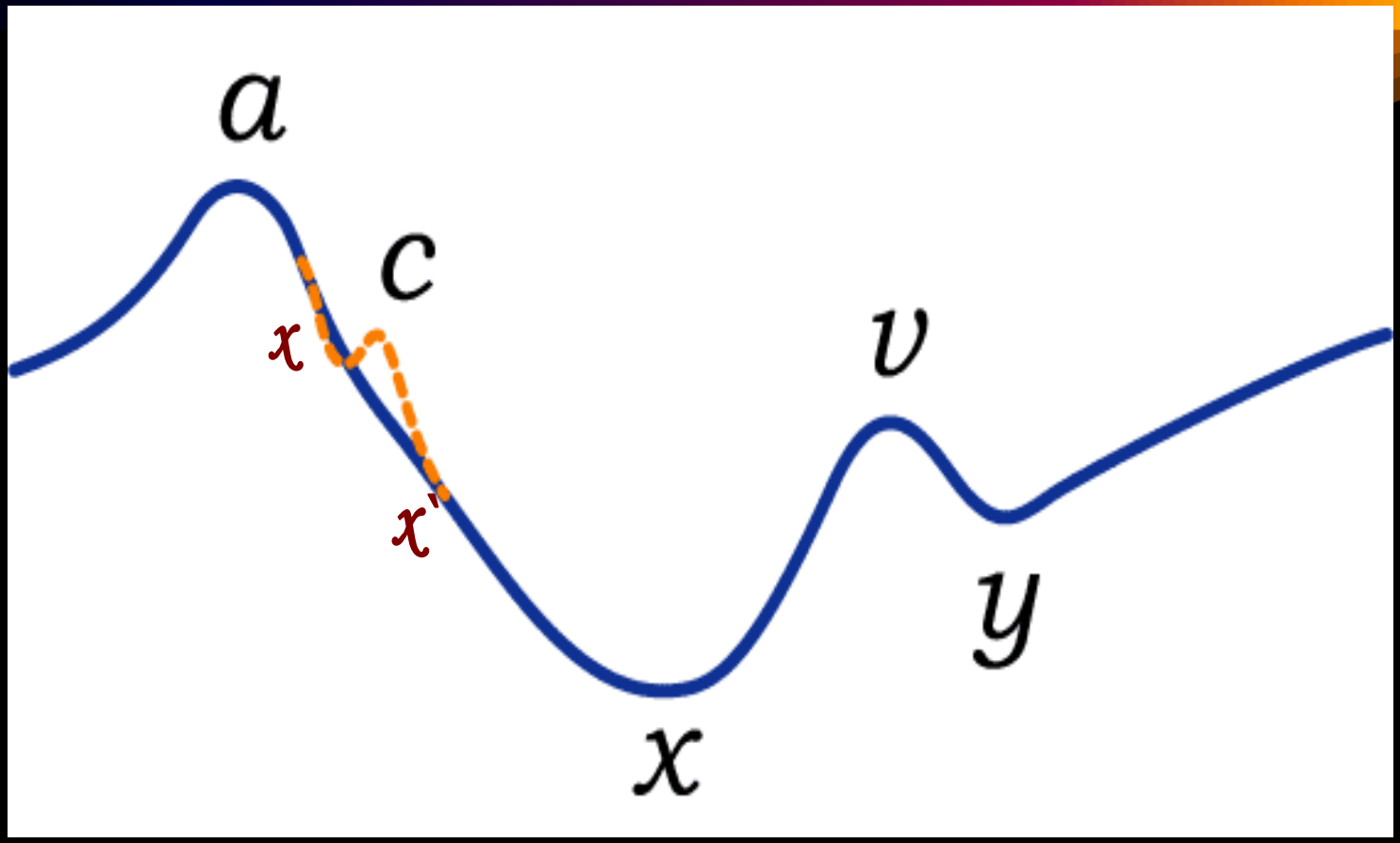
Jugular venous pressure

- Level of sternal angle is about 5 cm above the level of mid right atrium IN ANY POSITION.
- JVP is measured in ANY position in which top of the column is seen easily.
- Usually JVP is less than 8 cm water

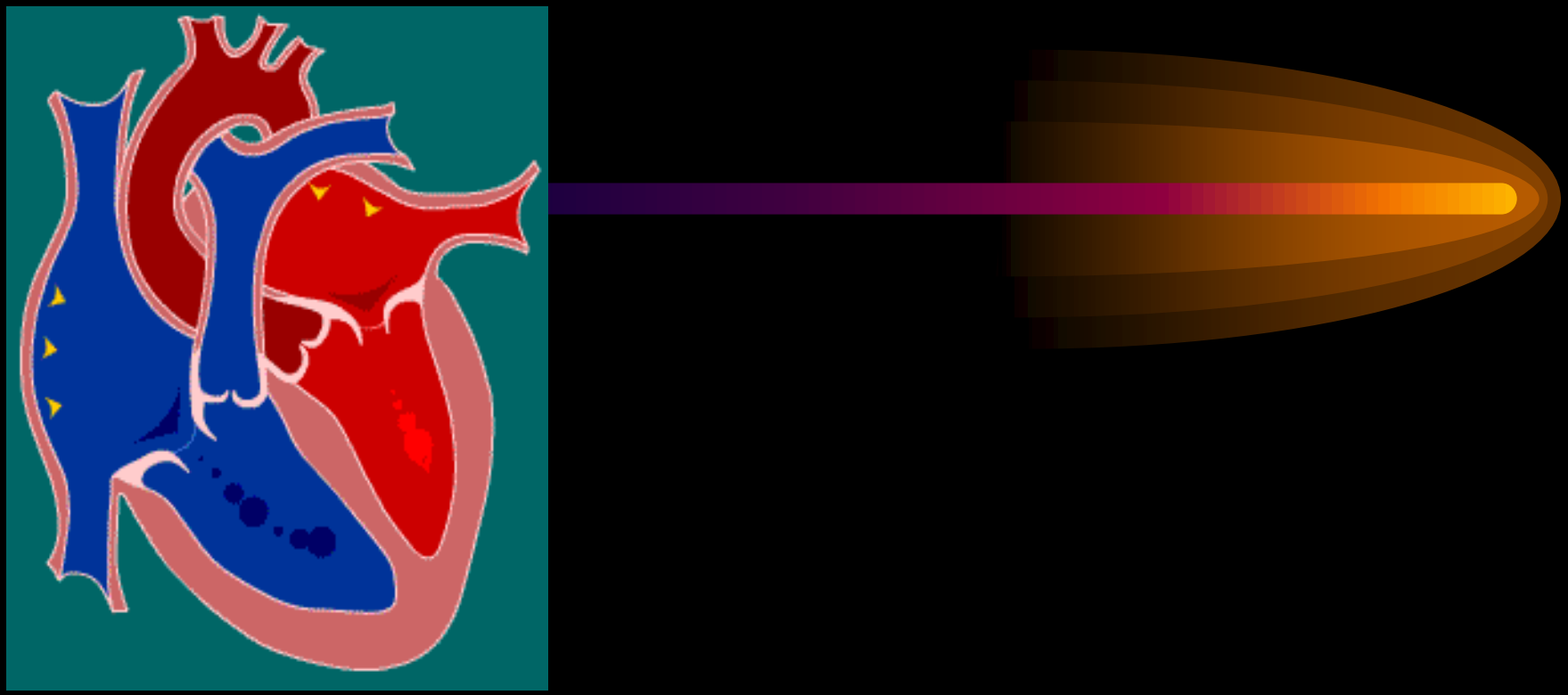
  < 3 cm column above level of sternal angle.


JVP= 2 + 5
=
7 cm of water
2
Top of
Jugular
Vein
Vertical
distance
above
angle of Louis
angle of Louis
5 cm
Right Atrium

Normal pattern of the jugular venous pulse



a WAVE



- Venous distension due to RA contraction
  Retrograde blood flow into SVC and IJV

- Precede Carotid pulse

- **The x descent:** is due to

  X Atrial relaxation

  X` Descent of the floor of the right atrium during right ventricular systole.

  Begins during systole and ends before S2

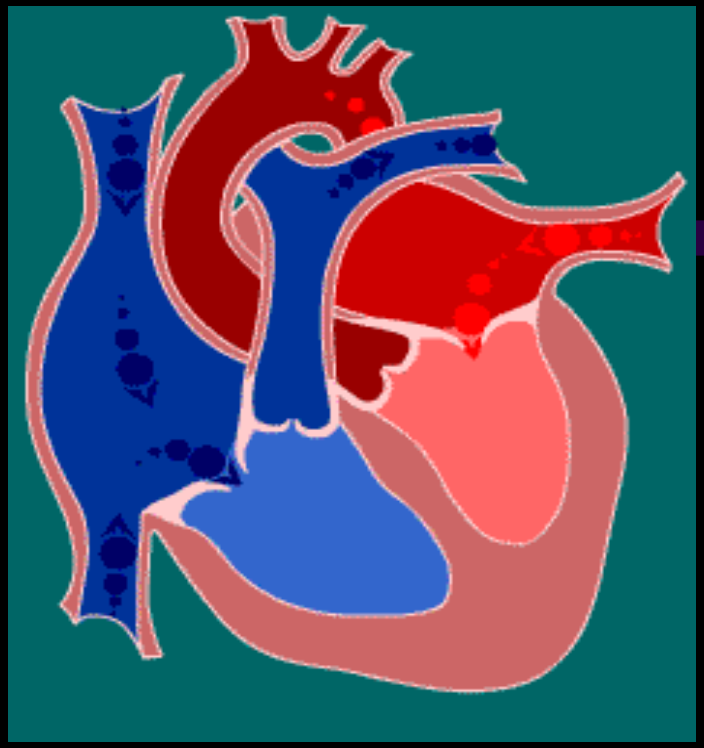
- **The c wave:**

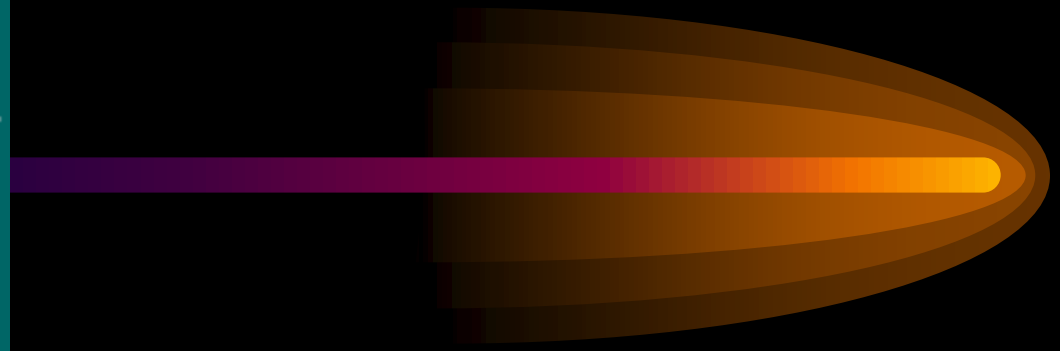
  Occurs simultaneously with the carotid pulse

  Artifact by Carotid pulsation

  Bulging of TV into RA during ICP

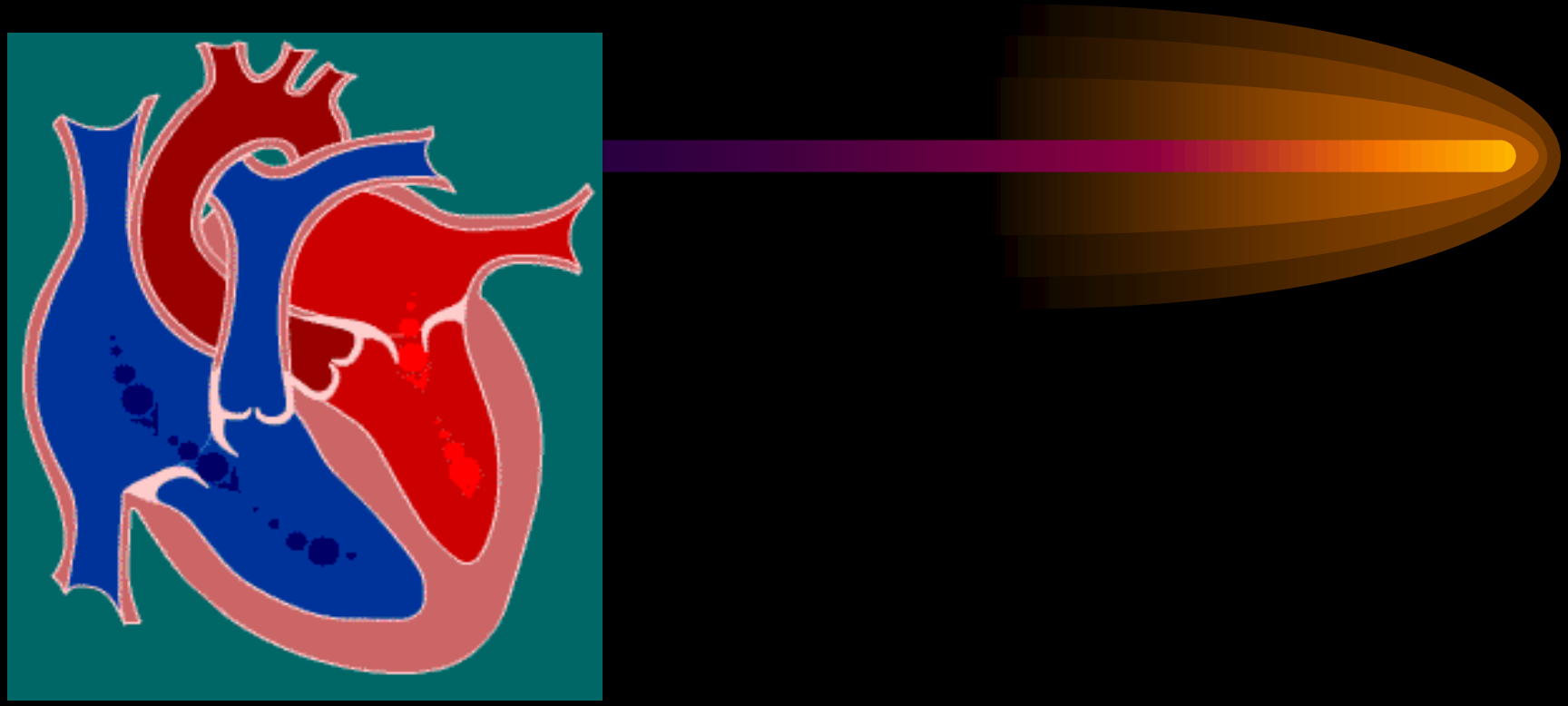
v WAVE





- Rising right atrial pressure when blood flows into the right atrium during ventricular systole when the tricuspid valve is shut.
- Synchronous with Carotid pulse

y DESCENT



- The decline in right atrial pressure when the tricuspid valve reopens

Examination of neck veins:

Congested neck veins only:

- SVC thrombosis.
- Aortic aneurysm causing mediastinal syndrome.
- Mediastinal tumor.

(These causes are usually associated with dilated veins on chest wall)

- Constrictive pericarditis.
- Cardiac tamponade.

Examination of neck veins (cont)

Pulsating neck veins:

- Prominent V wave in tricuspid incompetence.
- Absent A wave in atrial fibrillation.
- Prominent A wave in:
  - TS.
  - Severe PS.
  - Severe pulmonary hypertension.
  - Complete heart block (giant A wave due to simultaneous contraction of atrium and ventricle against a closed tricuspid valve. (cannon A wave)
  - Nodal rhythm. (cannon A wave)

Examination of neck veins (cont)

Congested pulsating neck veins:

- Right sided heart failure.
- Increased intrathoracic pressure e.g. emphysema.
- Increased intra-abdominal pressure e.g. massive ascites.
- Constrictive pericarditis.
- Pericardial effusion.
- Tension pneumothorax

Abdomino-jugular reflux

- Is positive when JVP increase after 10 sec of abdominal pressure followed by a rapid drop in pressure of 4 cm on release of compression.
- Most common cause of a positive test is RHF
- Positive Test imply SVC and IVC are patent

Kussmaul sign

Failure of decline in JVP occur during inspiration.

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

Hand Examination

Hand Examination

– *Cold hands* → low cardiac output failure and fear.

– *Warm hands* → high cardiac output failure e.g. thyrotoxicosis and beriberi.

– *Tremors* → - **fine**: congenital, nervousness, senility,, alcoholism, thyrotoxicosis,

- **coarse:** uremia, hepatic and respiratory failure and parkinsonism

- *Nails* → yellow nail syndrome (yellow nail + Rt pleural effusion + lymphedema)

Hand Examination (cont.)

***Clubbing of fingers**:*

- Def: it is bulbous enlargement of the soft tissues of the terminal phalanges with over curving of the nail bed in longitudinal and transverse directions.

Clubbing of fingers:

- **Degrees:**

1st degree: obliteration of the angle of nail bed detected clinically by:

- Looking tangentially to the nail bed.

- Palpating the nail bed by the index finger to detect softening and yielding of tissues under the nail.

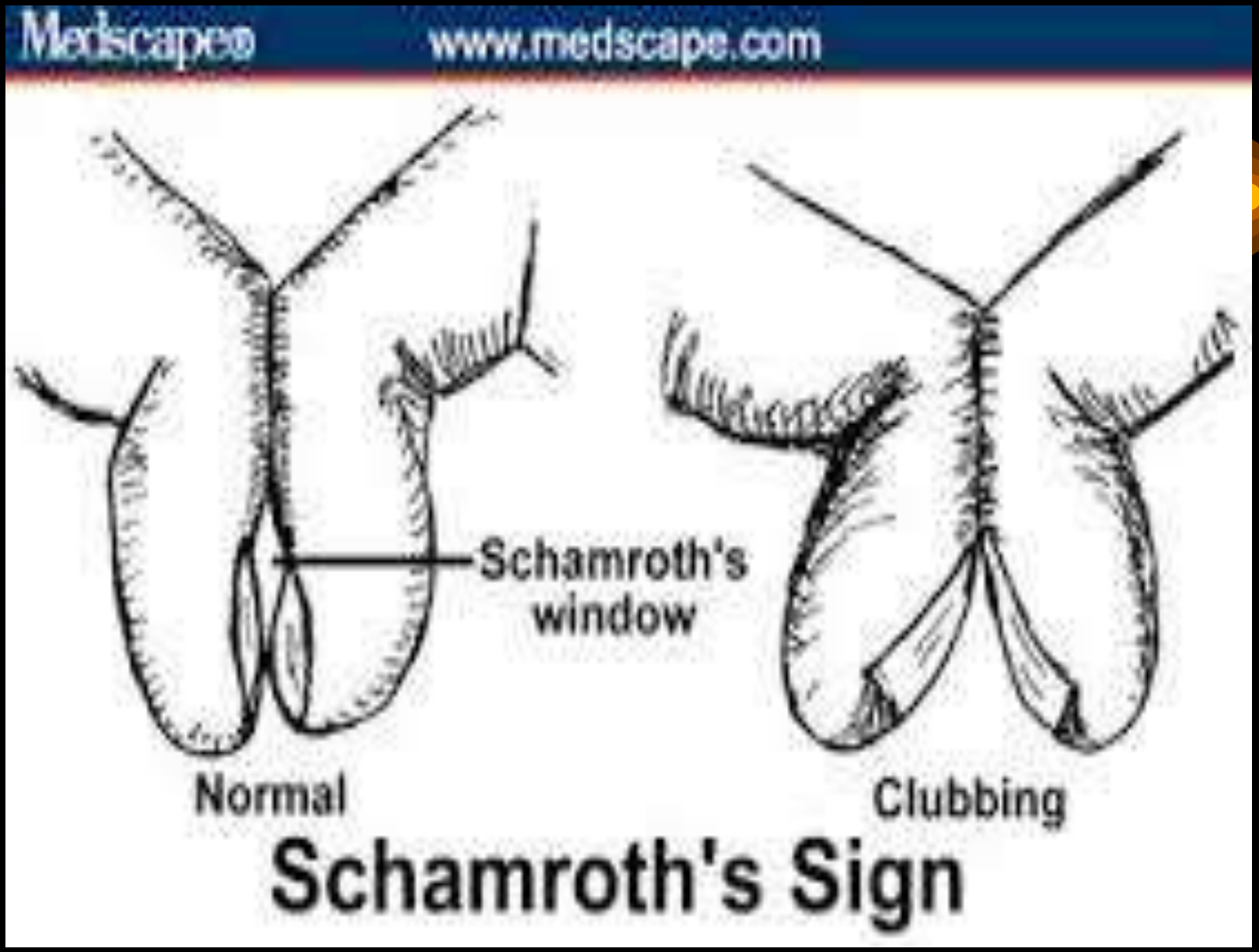
-window sign (schamroth sign)

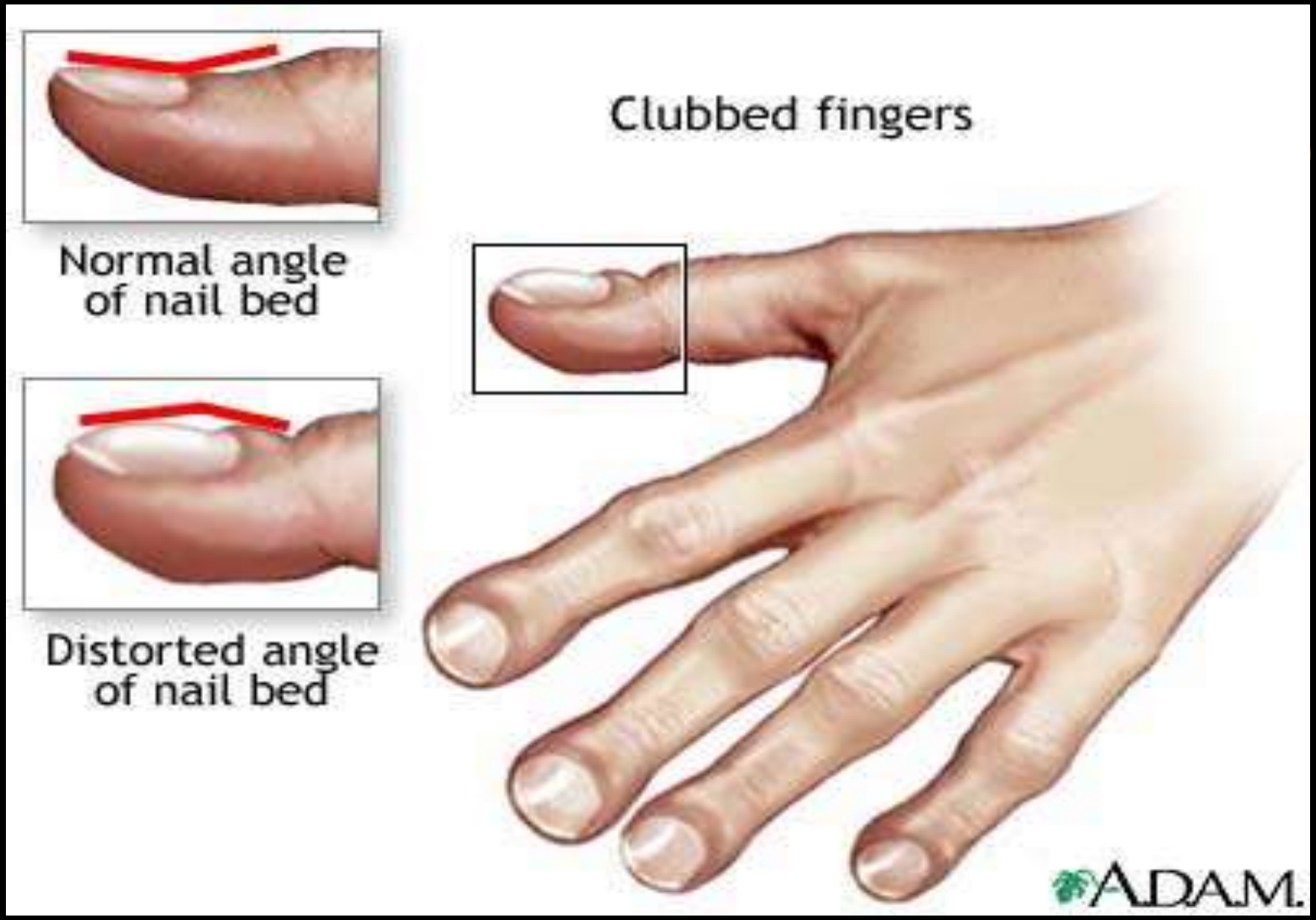
2nd degree: convexity of the angle of the nail bed (Parrot's peak).

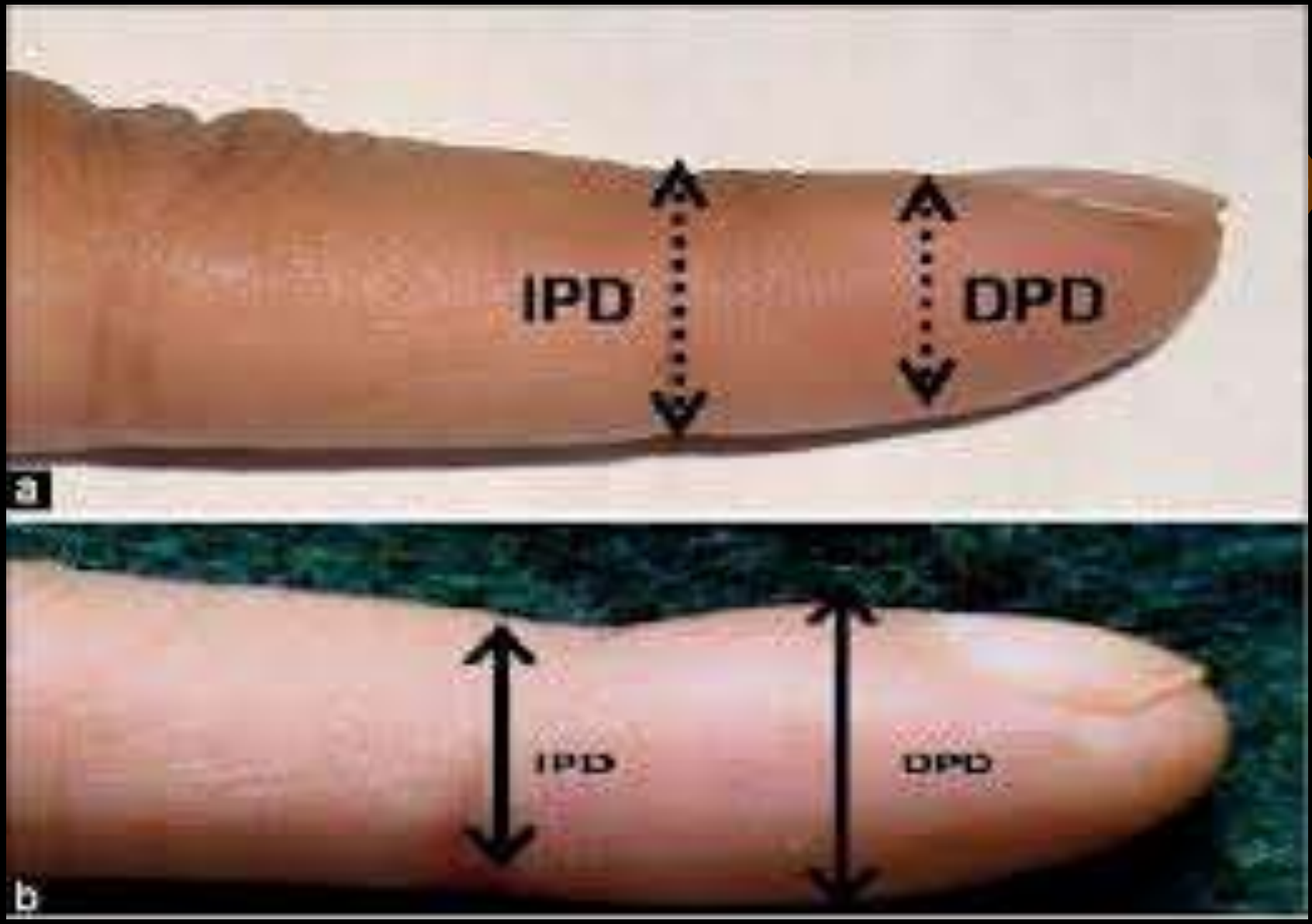
3rd degree: drum stick appearance.

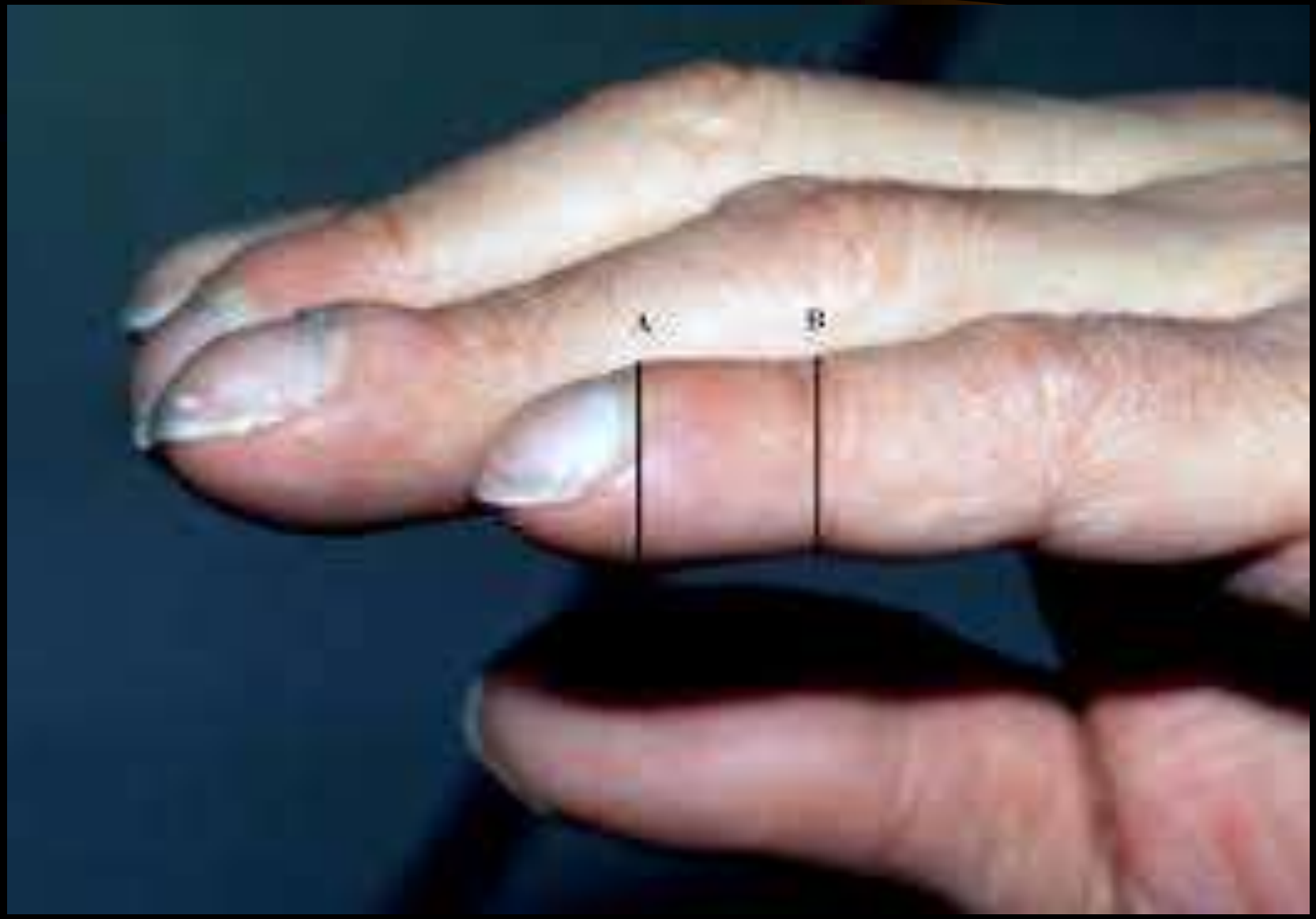
4th degree: pulmonary osteoarthropathy (widening and thickening of the ends of long bones).

window sign (schamroth sign)


Medscape®
www.medscape.com
Schamroth's window
Normal
Clubbing
Schamroth's Sign


Clubbed fingers
Normal angle of nail bed
Distorted angle of nail bed
A.D.A.M.


IPD
DPD
a
IPD
DPD
b


A
B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Hypertrophic pulmonary osteoarthropathy

Clubbing of fingers:

- ***Anoxemic clubbing (bluish in color):***

i. Congenital cyanotic heart diseases e.g. Fallout's tetralogy.
ii. ILDs
iii. High altitudes.

- ***Toxemic clubbing (pale in color):***

i. Infective endocarditis.
ii. Suppurative lung syndromes.
iii. Bronchial carcinoma.
iv. Primary biliary cirrhosis.
v. Ulcerative colitis.
vi. Polyposis of the colon.

- ***Miscellaneous:***

i. Familial.
ii. Occupational.

Lower Limb Examination

Lower Limbs

Edema:

- Unilateral or bilateral.
- Pitting or non-pitting. - painful or painless
- Extent up to sacral region (by pressure on the coccyx), abdomen (by pinching the abdominal wall) and chest wall (by pressure upon a rib or sternum).
- Puffiness of the eyelids and edema of the face.
- Signs of inflammation (thrombophlebitis and cellulites).

N.B. *Edema of lower limbs always precedes ascites except in tricuspid incompetence, constrictive pericarditis & pericardial effusion:* ***ascites precox.***

Lower Limbs

- Tenderness in calf muscles → deep venous thrombosis (DVT) and peripheral neuritis.
- Rashes.
- Clubbing,
- Cyanosis.
- Pulsations.

THANK YOU