

SURFACE MARKING - UPPER LIMB

1. Axillary Artery:

The arm is held at the right angles to the trunk and palm is directed upwards.

- (1) A point at the middle of lower border of the clavicle
- (2) A point at the junction at the anterior $\frac{1}{3}^{\text{rd}}$ and posterior $\frac{2}{3}^{\text{rd}}$ of the lateral wall of axilla (in front of lower part of posterior axillary fold)

Join (1) & (2) by a straight line.

2. Brachial Artery:

- (1) A point in front of lower border of posterior axillary fold.
- (2) A point $\frac{1}{2}$ inch below the midpoint of the elbow joint on its anterior aspect.

Join (1) & (2) by a straight line.

3. Superficial palmar arch:

- (1) A point at the lateral side of pisiform bone.
- (2) A point at the center of the thenar eminence.

Join (1) & (2) by a curved line concave upwards.

Highest point is at the level of distal border of the extended thumb.

4. Deep palmar arch:

- (1) Draw the superficial palmar arch.
- (2) Put a point just distal to the hook of hamate.

The deep arch can be represented by a horizontal line 4cm long drawn from the second point just below the level of superficial palmar arch.

5. Flexor retinaculum:

- (1) Mark the hook of hamate. (lies 2.5cm below and external to the pisiform bone)
- (2) Mark the crest of trapezium (apply pressure over thenar eminence, external to scaphoid)
- (3) Mark the pisiform bone
- (4) Mark the tubercle of scaphoid

Join the first two points by a line concave upwards. Join the last two points by a line concave upwards.

6. Extensor retinaculum:

- (1) Draw a line marking the lower part of anterior border of Radius.
- (2) Draw a line marking the tip of styloid process and medial side of carpus.

Join (1) & (2) by a 2cm broad oblique band on the lateral and posterior aspect of wrist, higher on lateral than on medial side.

SURFACE MARKING OF LOWER LIMB

1. Femoral Artery:

Lower limb should be abducted and externally rotated

- (1.) Point on the fold of groin mid way between the anterior superior iliac spine and pubic symphysis (mid inguinal point)
- (2.) Point on adductor tubercle located by placing the flat of the hand on the medial side of the thigh just above the medial condyle of femur.

Join these two points by a straight line. Upper $\frac{2}{3}$ of this line represents femoral artery.

2. Sciatic Nerve:

- (1) Mark a point 2.5 cm lateral to the midpoint of the line joining the posterior superior iliac spine and ischial tuberosity.
- (2.) Put another point just medial to the midpoint of the line joining the ischial tuberosity to the apex of the Greater Trochanter.
- (3.) Mark the upper angle of the popliteal fossa or midpoint of the junction of upper $\frac{2}{3}$ and lower $\frac{1}{3}$ of back of the thigh.

Draw a broad line passing downwards and laterally through these points.

3. Dorsalis pedis artery:

- 1) Put a point mid way between the two malleoli.
 - 2) Mark the proximal end of the 1st inter meta-tarsal space.
- Join these two points by a line.

SURFACE MARKING – THORAX

1. PLEURA

Apex (cervical pleura):

Can be represented by a curved line drawn from the sternoclavicular joint to the junction of the medial and middle third of the clavicle, the summit of the curve being 2.5 cm above the clavicle.

Anterior border:

From behind the sterno-clavicular joint downwards and medially to the point in the median plane behind the sternal angle. From this point the right and left costal pleurae descend in contact with each other as far as the level of 4th costal cartilages, below which the line differs on two sides.

On right side: It continues down to the xiphisternal joint just to the right of the median plane.

On left side: It diverges laterally and descends 1cm to the left of the body of the sternum at the level of the 6th costal cartilage.

Inferior border:

On right side: The costo-diaphragmatic line of reflexion of pleura begins from xiphoid process and passes behind the 7th costal cartilage reaching the mid-clavicular line on 8th costal cartilage, the mid-axillary line on the 10th rib. From here the line ascends slightly and crossing the 12th rib in the scapular line, reaches the 2.5cm lateral to the level of the upper border of the spine of 12th thoracic vertebra (8-10-12).

On left side:

The line follows the 6th costal cartilage reaching the mid-clavicular line on the 8th costal cartilage, the mid-axillary line on the 10th rib. From here the line ascends slightly and crossing the 12th rib in the scapular line, reaches 2.5cm lateral to the level of the upper border of the spine of 12th thoracic vertebrae.

Inferior border of left pleura is at a lower level than that of right side.

Posterior border:

Take two points:

- a) 2.5cm lateral to 7th cervical spine.
- b) 2.5cm lateral to 12th thoracic spine.

A vertical line joining these points represents posterior border of pleura.

2. LUNGS

Apex: It represents the same surface marking as the cervical pleura.

Anterior border:

Right lung: Corresponds very closely to costomediastinal line of pleural reflexion and it is almost vertical down to the level of 6th costal cartilage.

Left lung: Same as right lung up to the level of the 4th costal cartilage but below this point it passes laterally for about 3.5cm before curving down ward and medially to reach the 6th costal cartilage, 4cm. from median plane (cardiac notch).

Posterior border of Lungs:

Take 2 points:

- a) 2.5 cm. lateral to the 7th cervical spine.
- b) 2.5 cm. lateral on the 10th thoracic spine.

A vertical line joining the two points represents the posterior border of the lung.

Inferior Border:

Corresponds to (right side and left side) 6th rib in the mid- clavicular line, 8th rib in the mid- axillary line and 10th rib in the scapular line.

Oblique fissure:

Left Lung: The Oblique fissure lies opposite the interval between the spines of the 3rd and 4th thoracic vertebrae about 2.5 cm. from median plane posteriorly, and passes downwards and forwards across the costal surface of the lung, the fissure reaches 5th intercostal space in the mid- axillary line and follows this until it intersects the inferior border of the lung at 6th costochondral junction (7.5 cm. from the median plane).

Right lung: Corresponds closely with the oblique fissure of the left lung. Posteriorly it lies opposite the spine of the 4th thoracic vertebrae, as it descends it crosses the 5th intercostal space and then follows the general line of the 6th rib to the 6th costochondral junction.

Horizontal fissure: (Only to the right lung) – It begins in the oblique fissure near the mid- axillary line (5th intercostal space) and running horizontally forwards, cuts the anterior border at level with the sternal end of the 4th costal cartilage.

3. HEARTS AND VALVES

Apex (Apex beat): It is palpated in the left 5th inter-costal space slightly medial to the mid-clavicular line or about 9cm from the mid-line in an average adult male.

Right border: Corresponds to a line down from the upper border of the right 3rd costal cartilage, 1.2cm from the margin of the sternum, downwards to the 6th costal cartilage. This line is gently convex to the right.

Lower border: By a line joining the lower end of the right border to the apex beat.

Left border: Is represented by a line from apex beat upwards and medially to a point on the lower border of the left 2nd costal cartilage 1.2cm from the sternal margin. This line is convex upwards and to left.

Superior border: A line which joins the upper ends of the right and left borders (corresponds roughly to the upper limits of the atria).

Pulmonary orifice:

Lies partly behind the upper border of the left 3rd costal cartilage and partly behind the sternum. It is represented by a horizontal line 2.5cm long.

Aortic orifice:

Lies below and a little to the right of pulmonary orifice. It corresponds to a line 2.5cm. long drawn from the medial end of the left 3rd intercostal space downwards and to the right.

Mitral orifice:

Lies behind the left half of the sternum opposite the 4th costal cartilage and can be represented by a line 3.0cm long passing downwards and to the right.

Tricuspid orifice:

can be represented by a line 4cm long commencing in the median plane opposite the 4th costal cartilage and passing downwards and slightly to the right. The centre of the line should be opposite the middle of the 4th intercostal space.

SURFACE ANATOMY - ABDOMEN

1. VERMIFORM APPENDIX(Base)

McBurney's point:- the point is taken at the junction of lateral $1/3^{\text{rd}}$ and medial $2/3^{\text{rd}}$ of the line joining anterior superior iliac spine and umbilicus.

2. INFERIOR BORDER OF LIVER

a) A point in the left 5^{th} intercostal space about 9cms from the median line i.e. just below and medial to the left nipple.

b) About 1 cm below the right costal margin at the tip of the 10^{th} right costal cartilage

The inferior border of Liver can be marked by joining (a) and (b)

3. FUNDUS OF GALL BLADDER

It is at the point where the right linea semilunaris (outer border of rectus abdominis) crosses the tip of right 9^{th} costal cartilage.

4. KIDNEY

It is marked inside the Morris' parallelogram as follows

Draw 2 horizontal lines

a) At the level of the 11^{th} thoracic spine

b) At the level of 3^{rd} lumbar spine

Draw 2 vertical lines

a) About 2.5cms from the median plane

b) About 9cms from the median plane

Draw the kidney inside the parallelogram with the hilum of the kidney at the level of lower border of L_1 , the centre of the hilum about 5cms from the median plane.

SURFACE MARKING OF HEAD & NECK

1. THYROID GLAND

Isthmus:- It's upper border is represented by a line about 1.25 cm long, drawn about 1 cm below the cricoid cartilage, across the 2nd tracheal ring. The lower border lies 2 cm below and parallel to the upper border and lies at the level of the 4th tracheal ring.

Upper pole:-

Join 2 points:-

- (1.) On the anterior border of the Sternocleidomastoid opposite the laryngeal prominence.
- (2.) At the lateral end of the upper border of isthmus.

Lower pole:-

Draw a 3 cm long line downwards and laterally from the lateral end of the lower border of isthmus with slight convexity downwards.

To complete the outline of the gland join the upper end of the upper pole and lateral end of the lower pole.

2. INTERNAL JUGULAR VEIN: Represented by 2 lines (1.25cm apart) passing downwards from a point posterior to the condyle of the mandible to the medial end of the clavicle.

3. FACIAL ARTERY:

Take 4 Points.

- (1.) At the anterior border of sternocleidomastoid muscle just above the tip of greater cornua of hyoid bone.
- (2.) At the antero-inferior angle of masseter muscle.
- (3.) About 1.2 cm lateral to the angle of the mouth.
- (4.) At the medial angle of the eye.

Join (1) and (2) by a line which curves around the lower border of mandible and continue the line across the mandible to the third point and then along the side of the nose to the fourth point.

4. PAROTID GLAND :

Anterior Border: A line passing downwards from the upper border of mandibular condyle to a point just above the middle of the masseter and then downwards and

backwards to a point 2 cm below and behind the angle of the mandible.

Upper Border: A curved line drawn from the upper border of the mandibular condyle across the lobule of the auricle to the mastoid process.

Posterior Border: A straight line joining the lower end of anterior border and posterior end of upper border.

5. PAROTID DUCT: Corresponds to the middle $\frac{1}{3}^{\text{rd}}$ of a line joining the lower border of the tragus of ear to a point mid-way between ala of nose and margin of upper lip.
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VERTEBRAL LEVELS

1. Jugular notch-T₂-T₃ disc
2. Sternal angle -T₄-T₅ disc
3. Xiphi sternal joint - T₉
4. Tip of 9th costal cartilage- L₁
5. Lowest part of costal margin- L₃
6. Root of spine of scapula-T₃
7. Inferior angle of scapula-T₇
8. Highest point of iliac crest- L₄
9. Posterior superior iliac spine- S₂

VERTEBRAL LEVELS H&N:

1. Tip of mastoid process - C₁
2. Hard palate - C₁
3. Oral cavity - C₂
4. Symphysis menti - C₃
5. Upper border of thyroid cartilage - C₄
6. Cricoid cartilage - C₆