

## LEARNING OBJECTIVES

To understand the maternal & fetal anatomy relevant to labour & delivery

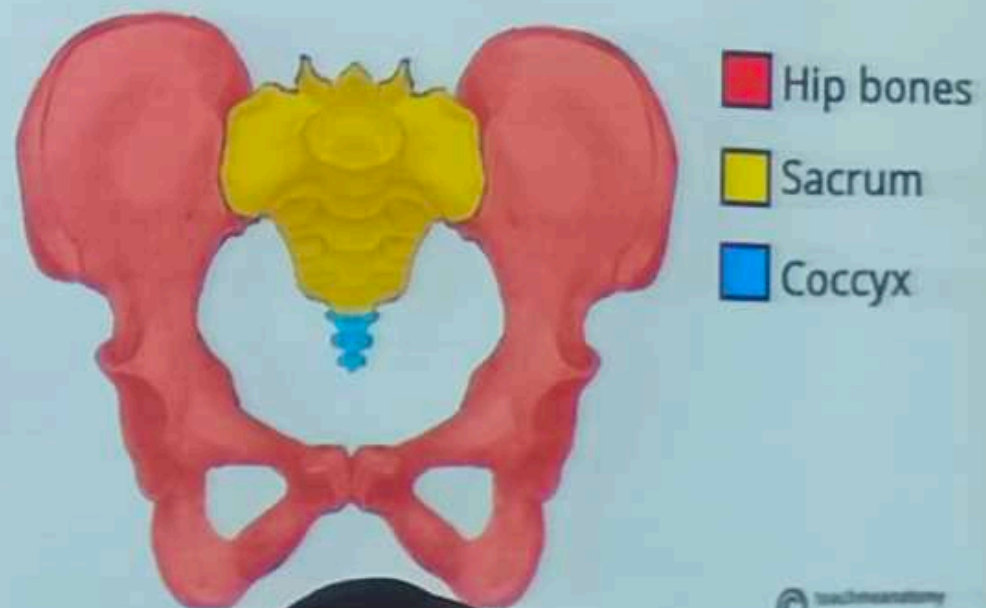


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# THE MATERNAL PELVIS

1. The pelvic inlet / brim
2. The pelvic midpelvis / midcavity
3. The pelvic outlet



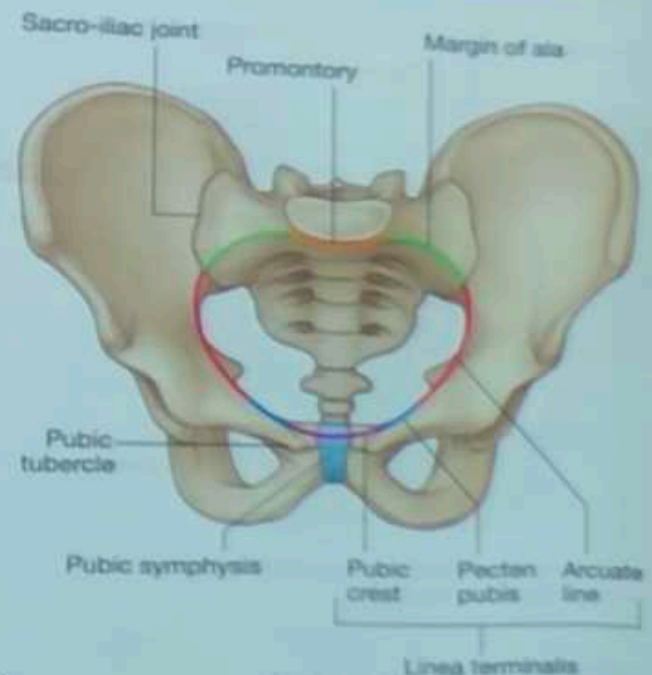
## THE PELVIC INLET

### BORDERS:

**Anteriorly:** Upper border of the symphysis pubis

**Laterally:** Upper margin of the pubic bone, iliopectineal line, ala of the sacrum

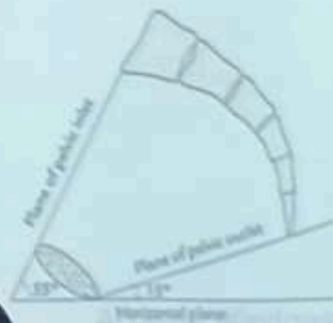
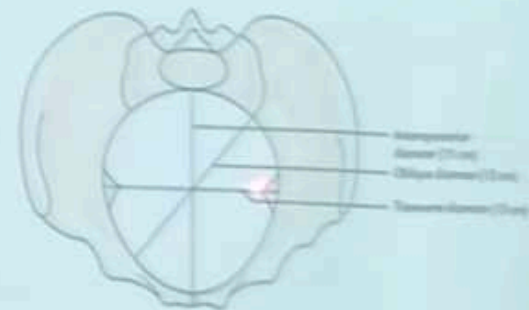
**Posteriorly:** Promontory of the sacrum



# INLET

## DIAMETERS:

- **Transverse diameter** in this plane, widest - **13.5cm**
- **Antero posterior diameter (AP)** - **11cm**
- The fetal head typically enters the pelvis oriented in a transverse position, wider transverse diameter
- The **angle of the inlet is 60 degree** to the horizontal



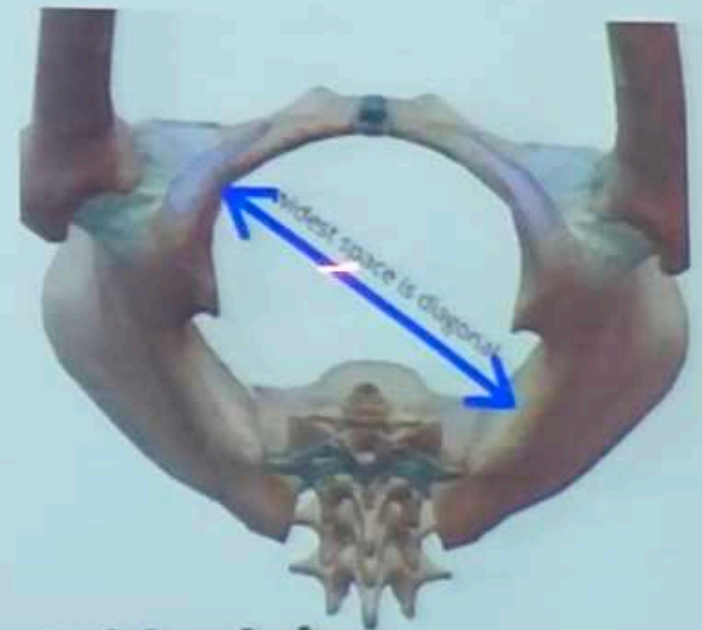




## MIDPELVIS

### DIAMETERS:

**Midpelvis** is almost round & transverse  
AP diameters are the same at **12cm**



**Midpelvis**

## THE ISCHIAL SPINES – TO ASSESS THE DESCENT (MIDPELVIS)

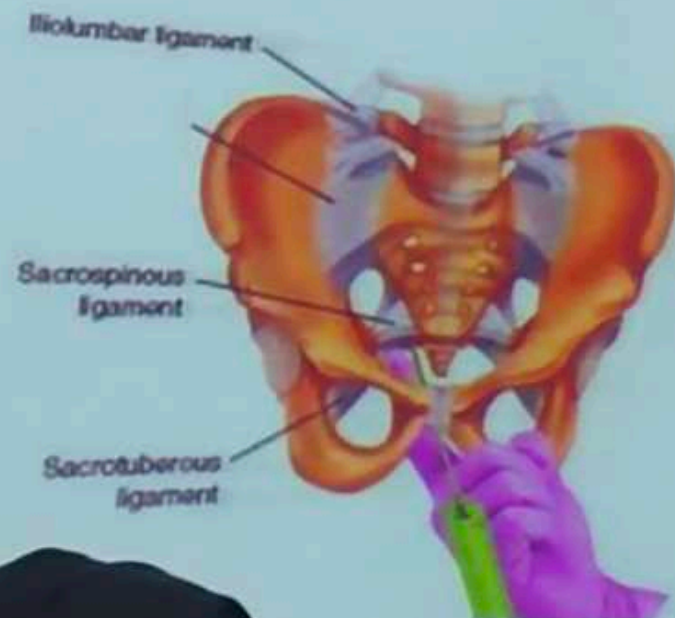
- Palpable vaginally & are used as important landmarks for two purposes
  1. **To assess the descent of the presenting part on vaginal examination**
- **Station zero** is at level of ischial spines - imp. landmark for instrumental delivery, if fetal head has reached ischial spines or below
- **Station -1** is at level of 1 cm above ischial spines
- **Station +1** is 1 cm below the spines





## ISCHIAL SPINES - PUDENDAL BLOCK

2. To provide a local anaesthetic pudendal nerve block –
  - For vacuum & forcep delivery



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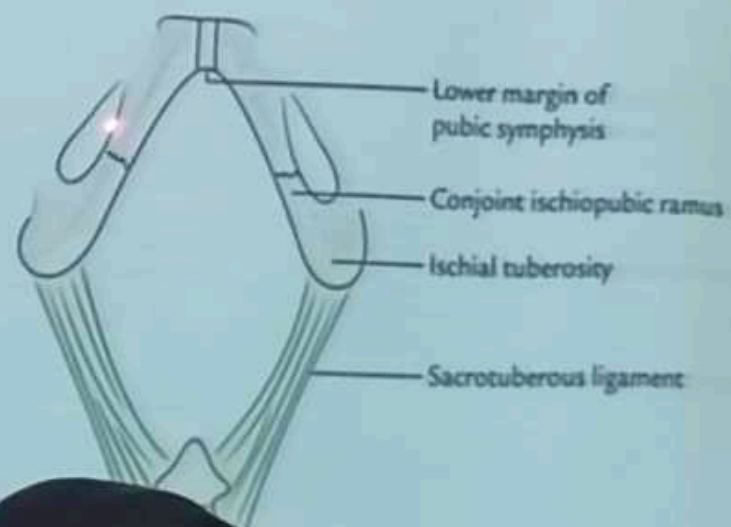
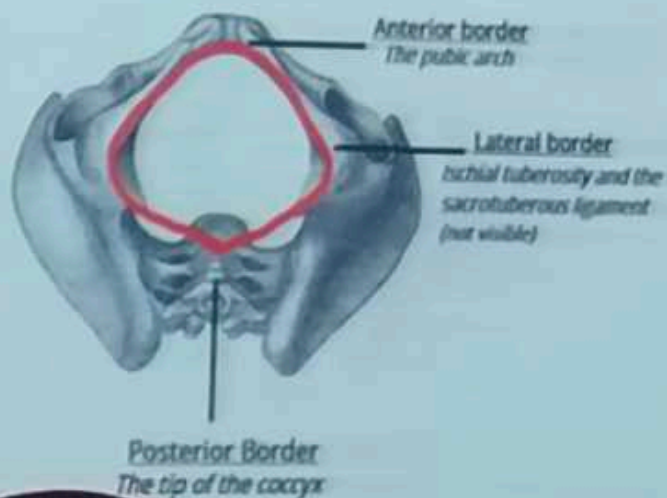
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# THE PELVIC OUTLET

## BORDERS:

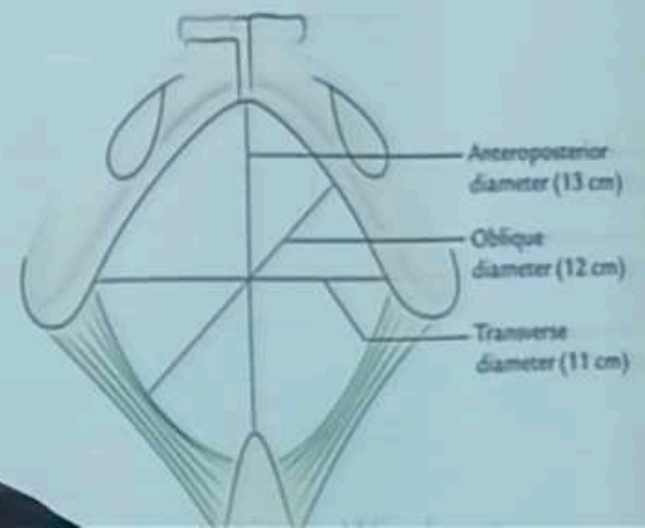
- **Anteriorly:** The lower margin of the symphysis pubis
- **Laterally:** Descending ramus of the pubic bone, the ischial tuberosity, sacrotuberous ligament
- **Posteriorly:** Last piece of the sacrum



## PELVIC OUTLET

### DIAMETERS:

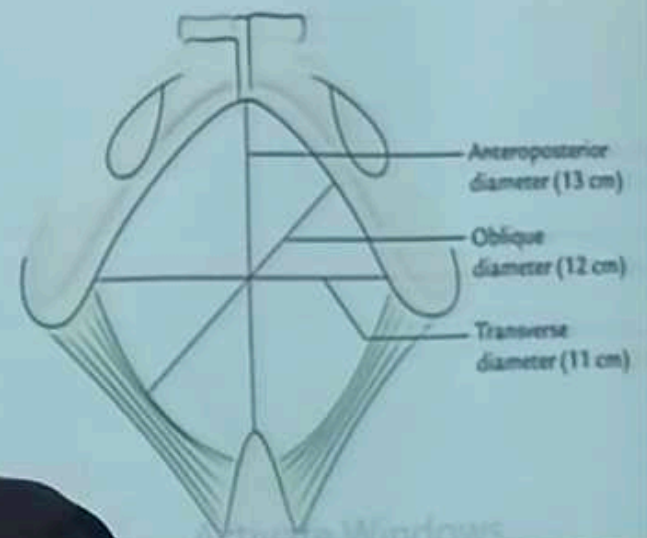
- **AP diameter** is **13.5cm** (widest at outlet)
- **Transverse diameter** is **11cm**
- Head must rotate from a transverse to AP position as it passes through the pelvis
- This rotation happens in the midpelvis, where transverse & AP diameters are similar



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# DIAMETERS OF THE PELVIS

	Antero-posterior	Oblique	Transverse
Brim	11	12	13
Cavity	12	12	12
Outlet	13	12	11

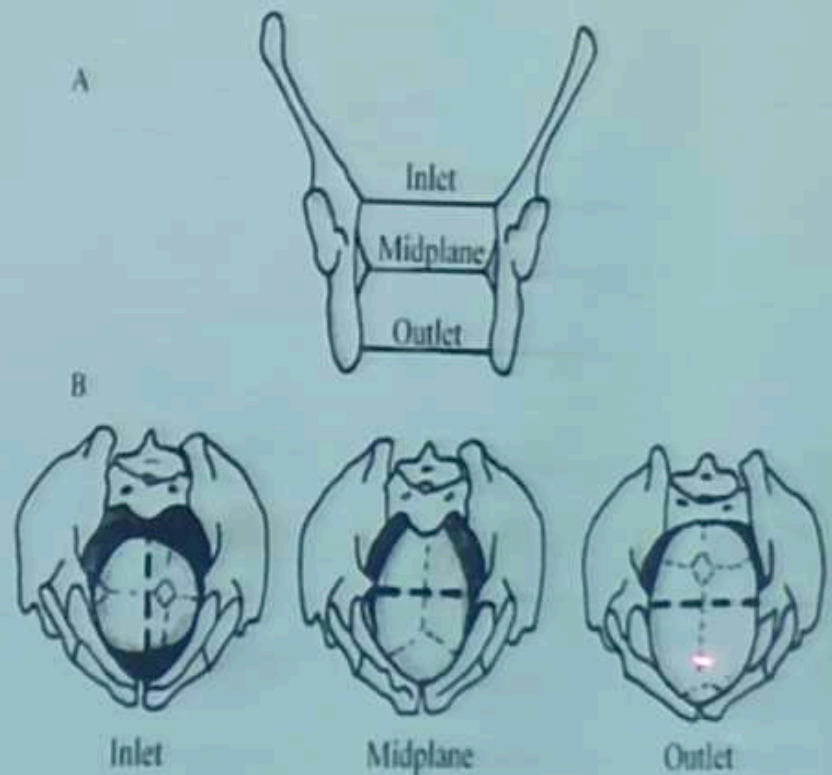


Figure 1-3 Diameters of the Pelvis



## PELVIC SHAPE

- Maternal stature
- Ethnicity
- Previous pelvic fractures
- Metabolic bone disease eg. rickets
- As the pelvic ligaments at the pubic ramus & sacroiliac joints loosen towards term, pelvis becomes more flexible & diameters may increase during labour

## TYPES OF PELVIS

- **GYNAECOID PELVIS:**

Most common & most favourable for labour

- **ANDROID TYPE PELVIS:**

Predispose to failure of rotation & deep transverse arrest

- **ANTHROPOID PELVIS:**

Encourages an occipitoposterior position

- **PLATYPELLOID PELVIS:**





Associated with increased risk of obstructed labour

d/t failure of the head to engage, rotate or descend

### TYPES



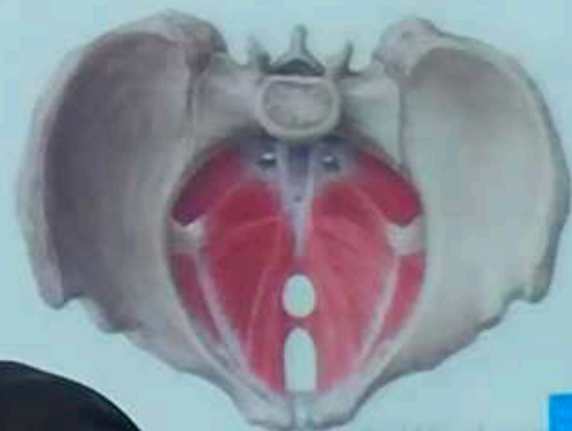
# TYPES OF PELVIS

	Gynecoid	Anthropoid	Android	Platypelloid
				
Pelvic inlet Transverse diameter		Narrow		
AP diameter		Wide		Narrow
Forepelvis	Wide	Divergent	Narrow	Straight
Pelvic midcavity Side walls	Straight	Narrow	Convergent	Wide
Inclination of sacrum		Wide	Forward	Narrow
Pelvic outlet Subpubic arch	Wide		Narrow	Wide



## THE PELVIC FLOOR

- This is formed by the **two levator ani muscles**, with their fascia form a **musculofascial gutter** during the second stage of labour
- The configuration of the bony pelvis together with the gutter shaped pelvic floor muscles encourage the fetal head to flex & rotate as it descends through the midpelvis towards the pelvic outlet





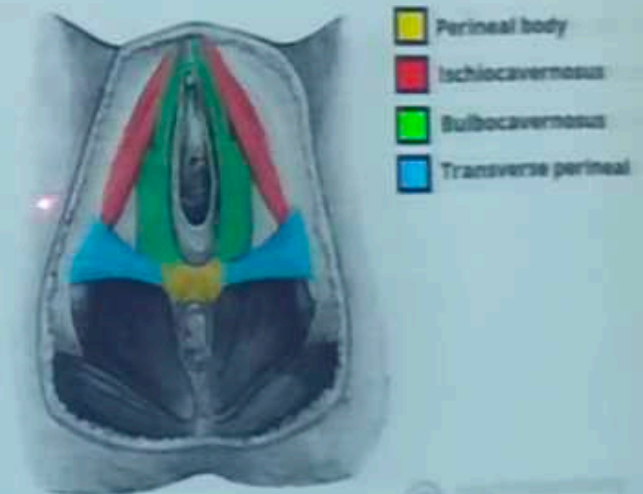
## THE PERINEUM

- It is the final obstacle to be overcome by the fetus

**PERINEAL BODY:** Is a condensation of the fibrous & the muscular tissue lying b/w the vagina & anus

**ATTACHMENTS:** Receives attachments of:

- Posterior ends of the **bulbo-cavernous muscles**
- Medial ends of the **superficial transverse perineal**
- **Deep transverse perineal muscles**
- Anterior fibres of the **external anal sphincter**



© Anatomical

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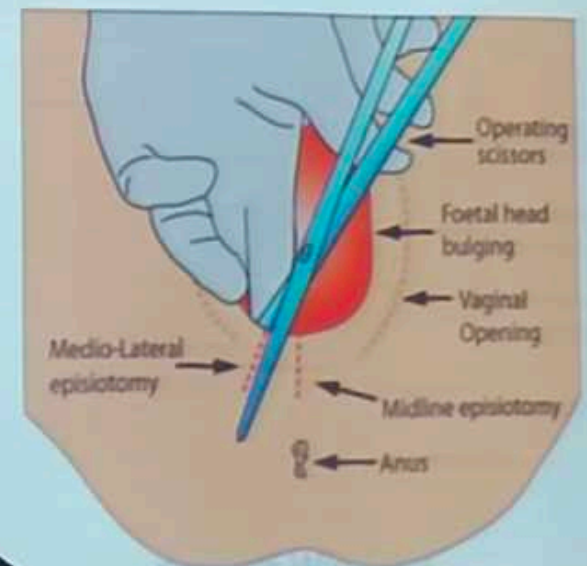
# EPISIOTOMY

## Nulliparous women:

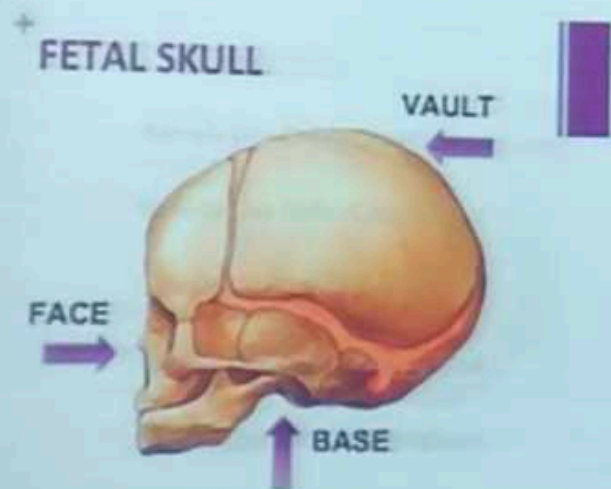
- Perineum is taut & relatively resistant
- Labour can be prolonged - **Episiotomy** (surgical cut)

## Multiparous women:

- It is stretchy & less resistant
- Faster labour



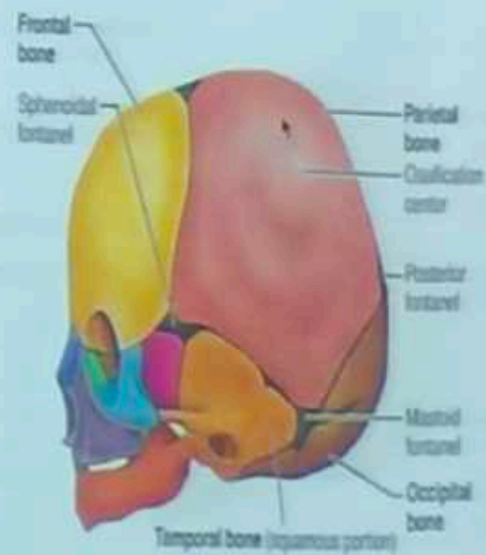
# THE FETAL SKULL



## FETAL SKULL

### BONES

- # 2 FRONTAL BONE
- # 2 PARIETAL BONE
- # 2 TEMPORAL BONE
- # 1 OCCIPITAL BONE



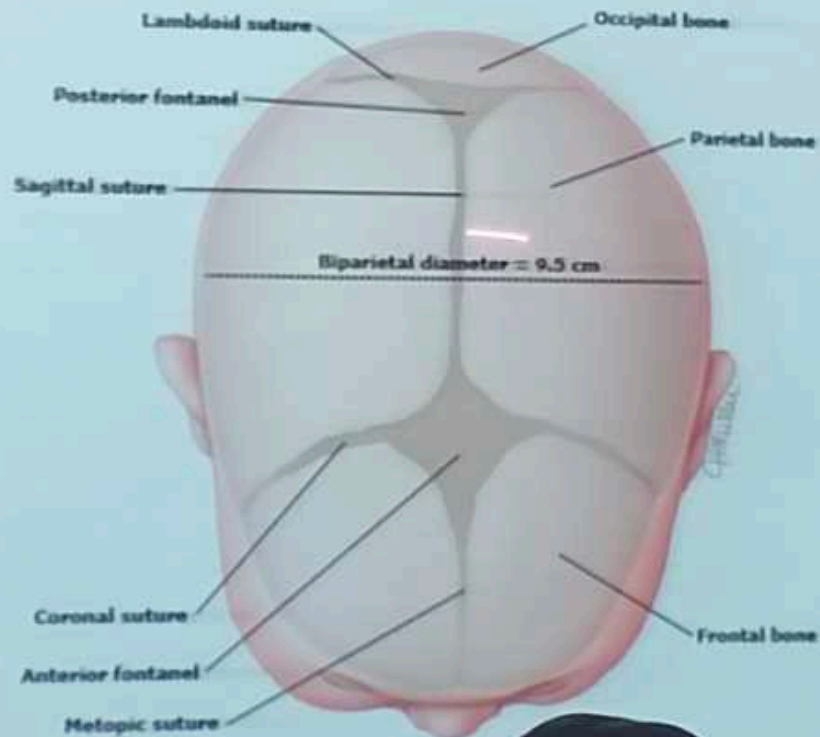


## THE SKULL BONES, SUTURES & FONTANELLES

- The fetal skull is made up of the vault, face & base
- **SUTURES:** Lines formed where the individual bony plates of the skull meet one another
- Saggittal, Frontal, Coronal & Lambdoid
- At the time of labour the sutures joining the bones of the vault are soft, unossified membranes
- Sutures of the fetal face & skull base are firmly united



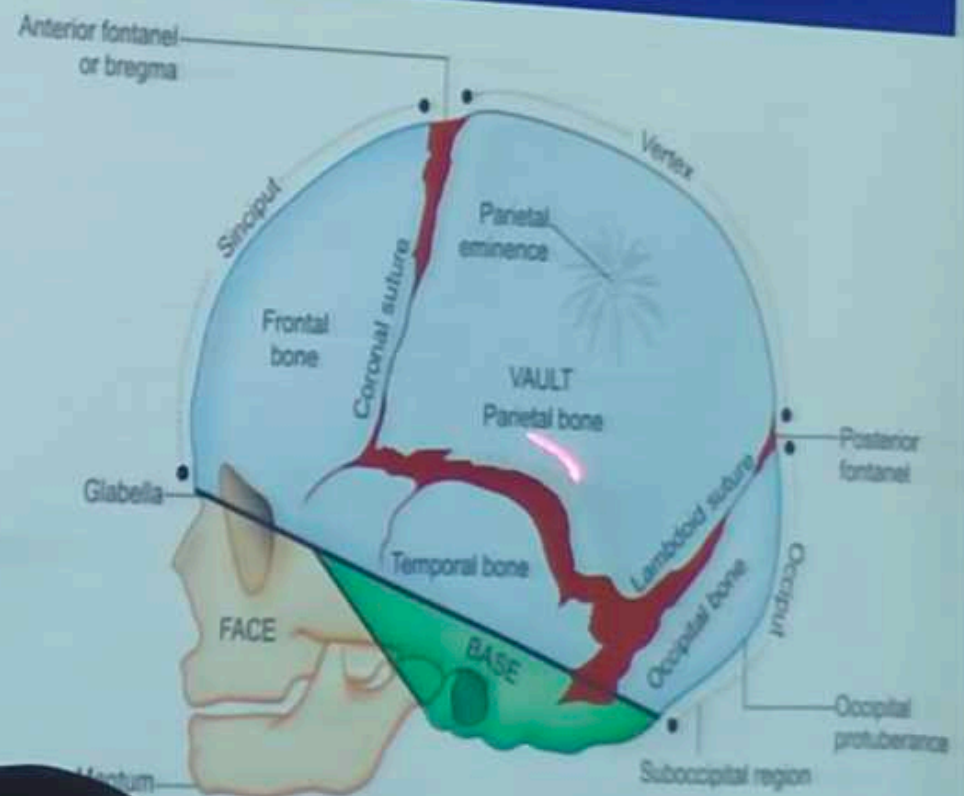
# SUTURES & FONTANELLES



# VAULT

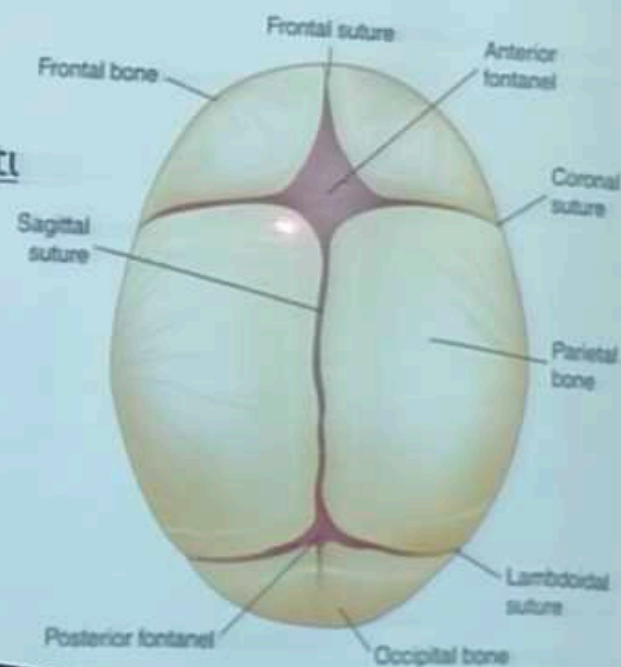
Consists of the:

- Parietal bones
- Parts of the occipital
- Frontal
- Temporal bones
- Between these bones are four membranous sutures



# FONTANELLES

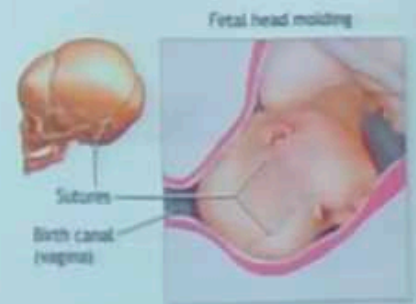
- These are the junctions of the various sutures
- **Anterior fontanelle** is also known as **bregma**
- It is at the junction of the sagittal, frontal & coronal sutures
- It is diamond shape
- On P/V exam. Four suture lines can be felt



# FONTANELLES

## Posterior fontanelle

- Lies at the junction of the sagittal suture & the lambdoid suture, b/w the two parietal & occipital bone
- It is smaller & triangular shaped
- Sutures are not fixed & is important for labour, allows the bones to overlap
- Bones are compressible & allow **moulding**, reduces diameters of the fetal skull





# MOULDING

- Severe moulding or moulding early in labour can be sign of obstructed labour d/t fetal malposition eg (failure of head to rotate or CPD)
- In normal labour the vertex of the fetal head is the presenting part

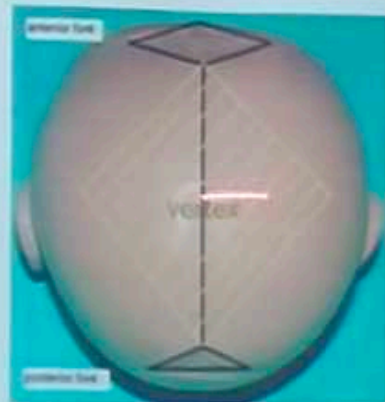
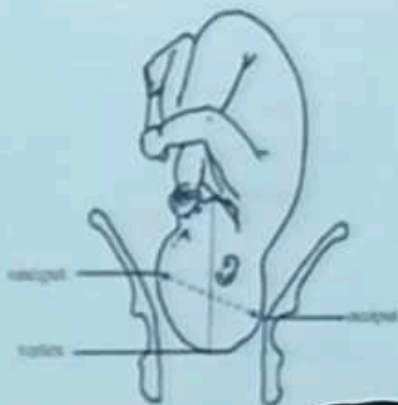
## Molding

Head conforms to the size and shape of the birth canal



# VERTEX

- The area of the fetal skull bounded by the two parietal eminences & the anterior & posterior fontanelle is known as **vertex**
- In normal labour vertex is the presenting part & the posterior fontanelle (occiput) is used to define the position of the fetal head in relation to pubic symphysis

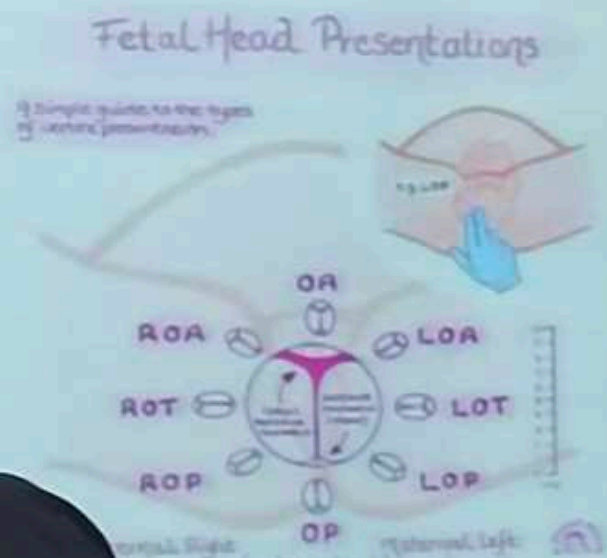


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# FETAL HEAD PRESENTATIONS

The **occiput anterior (OA)** is the most favourable for a spontaneous vaginal birth  
The **occiput-transverse (OT) position** or **OP position** is a malposition  
& may result in prolonged labour,  
instrumental delivery  
or CS

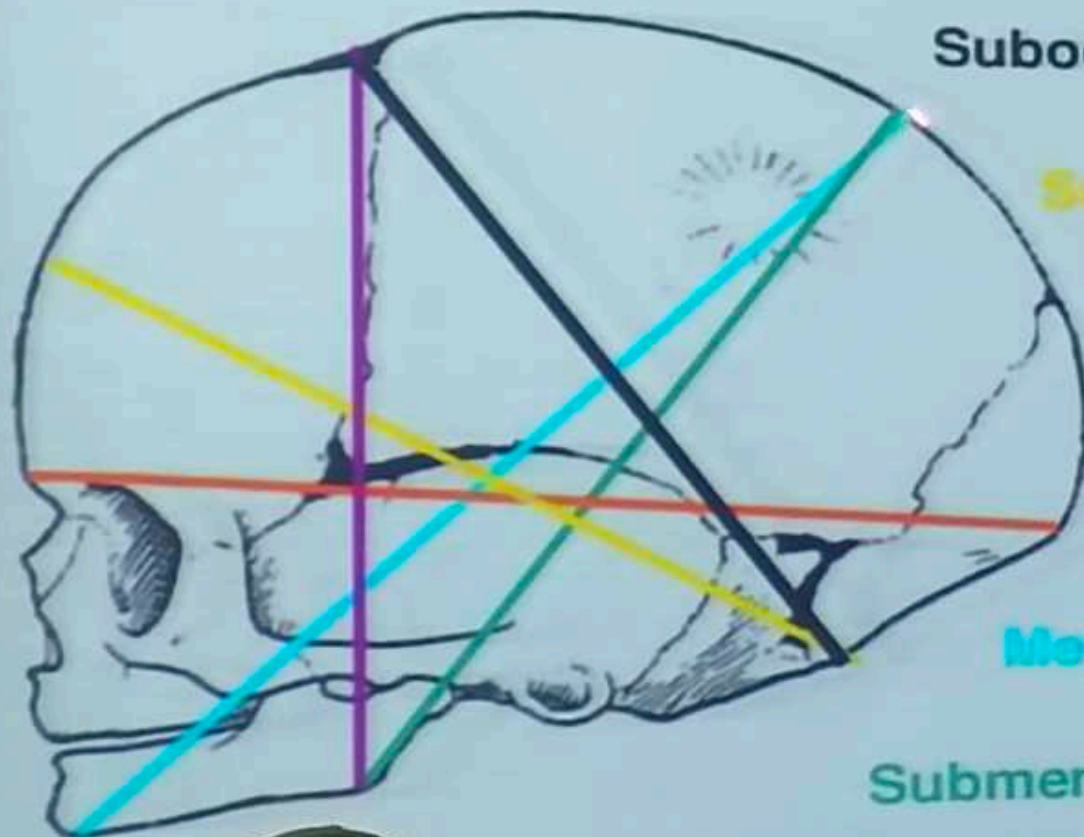




## DIAMETERS OF THE FETAL SKULL

- The fetal head is ovoid in shape
- The attitude of the fetal head refers to the degree of flexion & extension at the upper cervical spine
- Different longitudinal diameters are presented to the pelvis in labour depending on the attitude of the fetal head

# Longitudinal Diameters



Suboccipitobregmatic 9.5cm

Suboccipitofrontal 10cm

Occipitofrontal 11.5cm

Submentobregmatic 9.5cm

Mentovertical 13.5cm

Submentovertical 11.5cm

## DIAMETERS

### Sub-occipito bregmatic diameter:

- Longitudinal diameter that presents with a flexed attitude of fetal head (chin on chest) - 9.5 cm
- Measured from beneath the occiput (sub-occipital) to centre of anterior fontanelle (bregma)

### Sub-occipito frontal diameter:

- Occiput-posterior (OP) position, less well flexed head
- Measured from the suboccipital region to the prominence of the forehead & measures - 10 cm



### **Occipito-frontal diameter:**

- Deflexed head
- From the root of the nose to the posterior fontanelle, measures - 11.5 cm

### **Mento-vertical diameter:**

- Longest, from the chin to the vertex, measures - 13 cm
- **Brow presentation**, too large to pass through the pelvis

### **Submento-bregmatic diameter:**

- From below the chin to the anterior fontanelle – 9.5 cm
- **Face presentation**, can deliver vaginally when chin is anterior (mento-anterior)