NORMAL LABOUR

Introduction, maternal and fetal anatomy

By
Suhaila Al-Shaikh

reference textbook
Obstetrics by ten teachers
20th ed (2017)

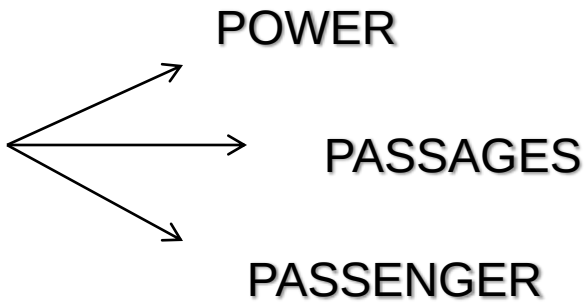
Learning objectives

1. **The student should know the types of female pelvis.**
2. **understand the importance of the dimensions of the bony pelvis of the pregnant woman in determining the progress of labour and the mode of delivery.**
3. **How to assess pelvic dimensions.**
4. **Know the dimensions of the fetal skull.**
5. **Understand how the attitude of the fetal head affects these dimensions.**

labour

Labour or human parturition is the **physiological process** that results in birth of a baby, delivery of the placenta and the signal for lactation to begin.

The 3 Ps ??



Labour

Health professionals who manage labour should understand that:

The first important step is to recognize when labour has **started**.

Labour is then divided into three stages:

the **first stage** begins with diagnosis of the onset of labour and is complete when full cervical dilatation ?? (how many cm)has been reached;

the **second stage** begins with full cervical dilatation and ends with birth of the baby;

and the **third stage** begins with birth of the baby and ends with complete delivery of the placenta and membranes.

Complications can occur during any of the three stages and can be divided into maternal and fetal-neonatal complications.

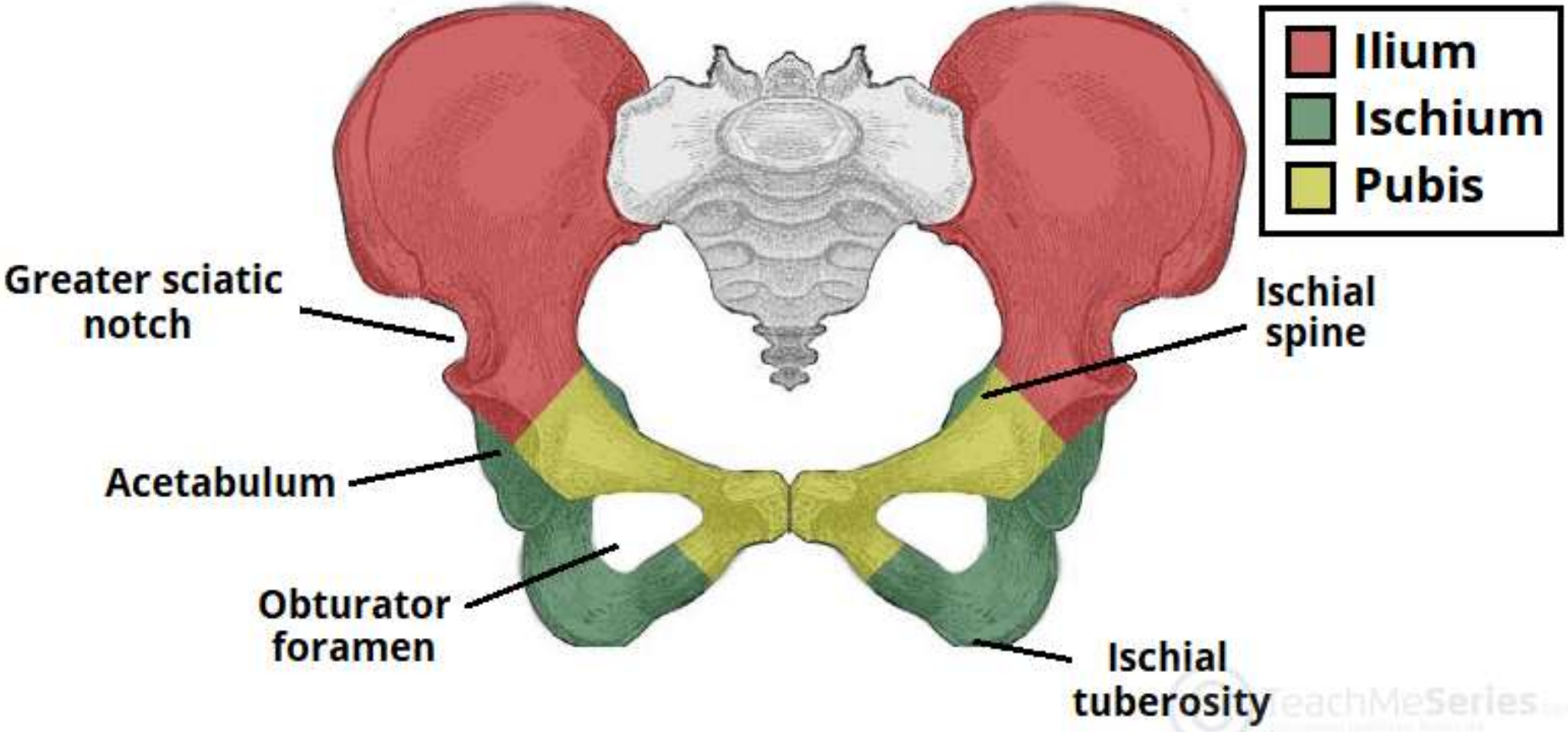
- ***Labour*** can be defined as the process by which regular painful contractions bring about effacement and dilatation of the cervix and descent of the presenting part, leading to expulsion of the fetus and the placenta from the mother.

A doctor or midwife who manages labour must be aware of the normal anatomy and physiology of the mother and fetus, what distinguishes an abnormal from a normal labour, and when it is appropriate to intervene

Anatomy
Maternal bony pelvis and fetal head

Bony pelvis

- **The bony pelvis is made of 4 bones: the sacrum, coccyx, and 2 innominate bones which are (composed of the ilium, ischium, and pubis). These are held together by the SIJ, SP, and the SCJ joints.**

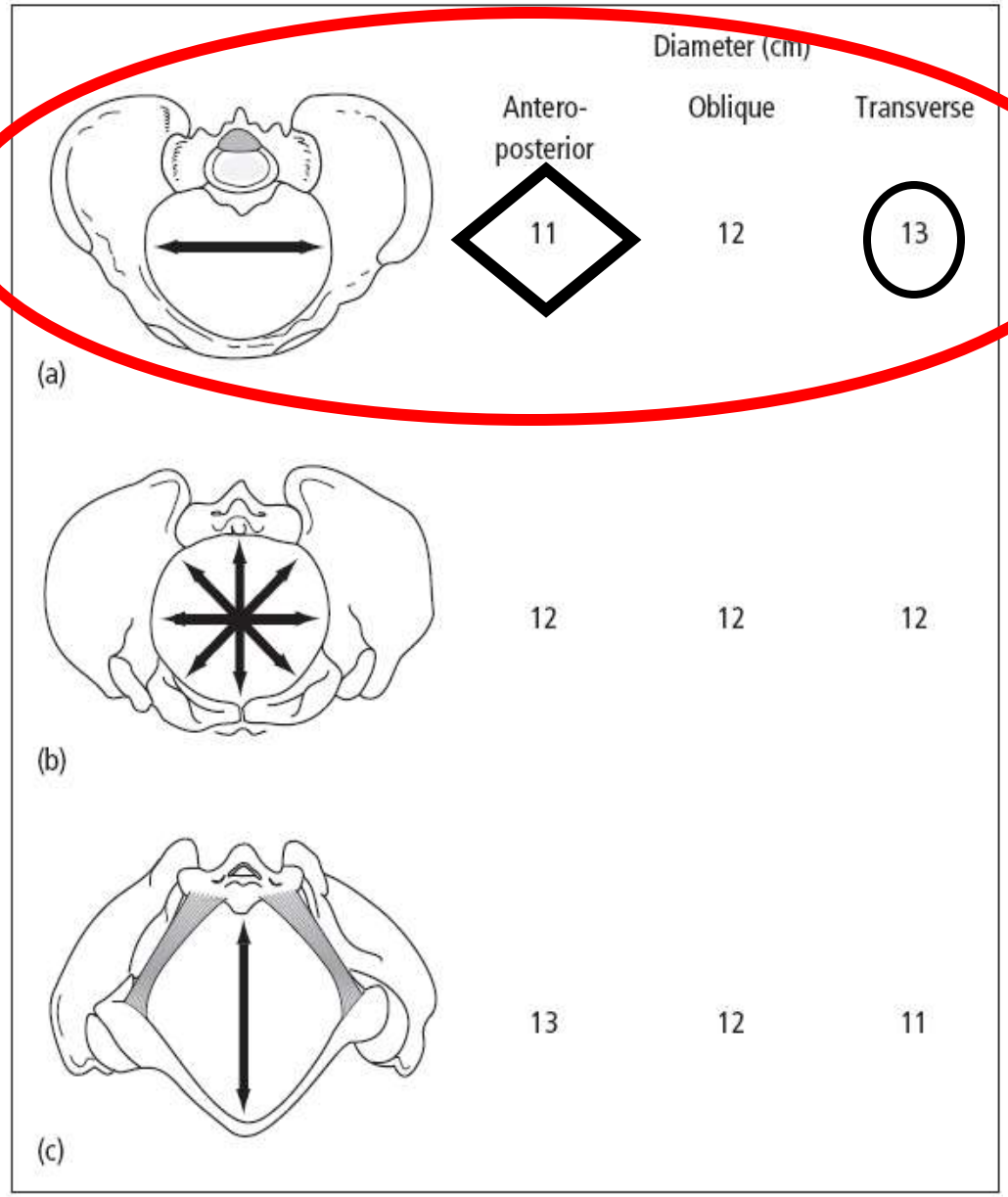

Ilium
Ischium
Pubis
Greater sciatic notch
Ischial spine
Acetabulum
Obturator foramen
Ischial tuberosity

The bony pelvis.

(a) Inlet: Bean shaped.

(b) Mid-cavity: Circular.

(c)Outlet:Diamond shaped.

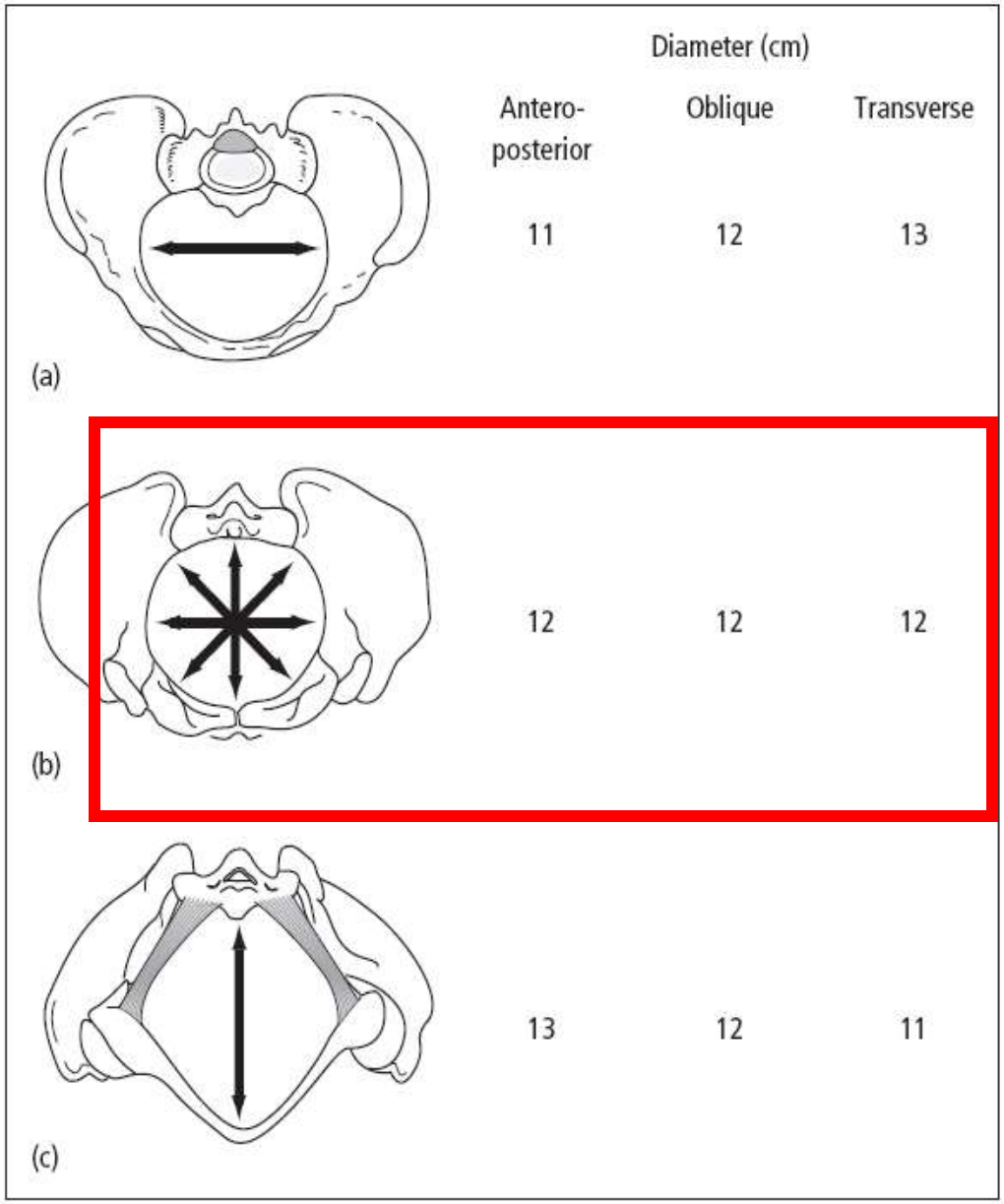


The bony pelvis.

(a) Inlet: Bean shaped.

(b) Mid-cavity: Circular.

(c)Outlet:Diamond shaped.

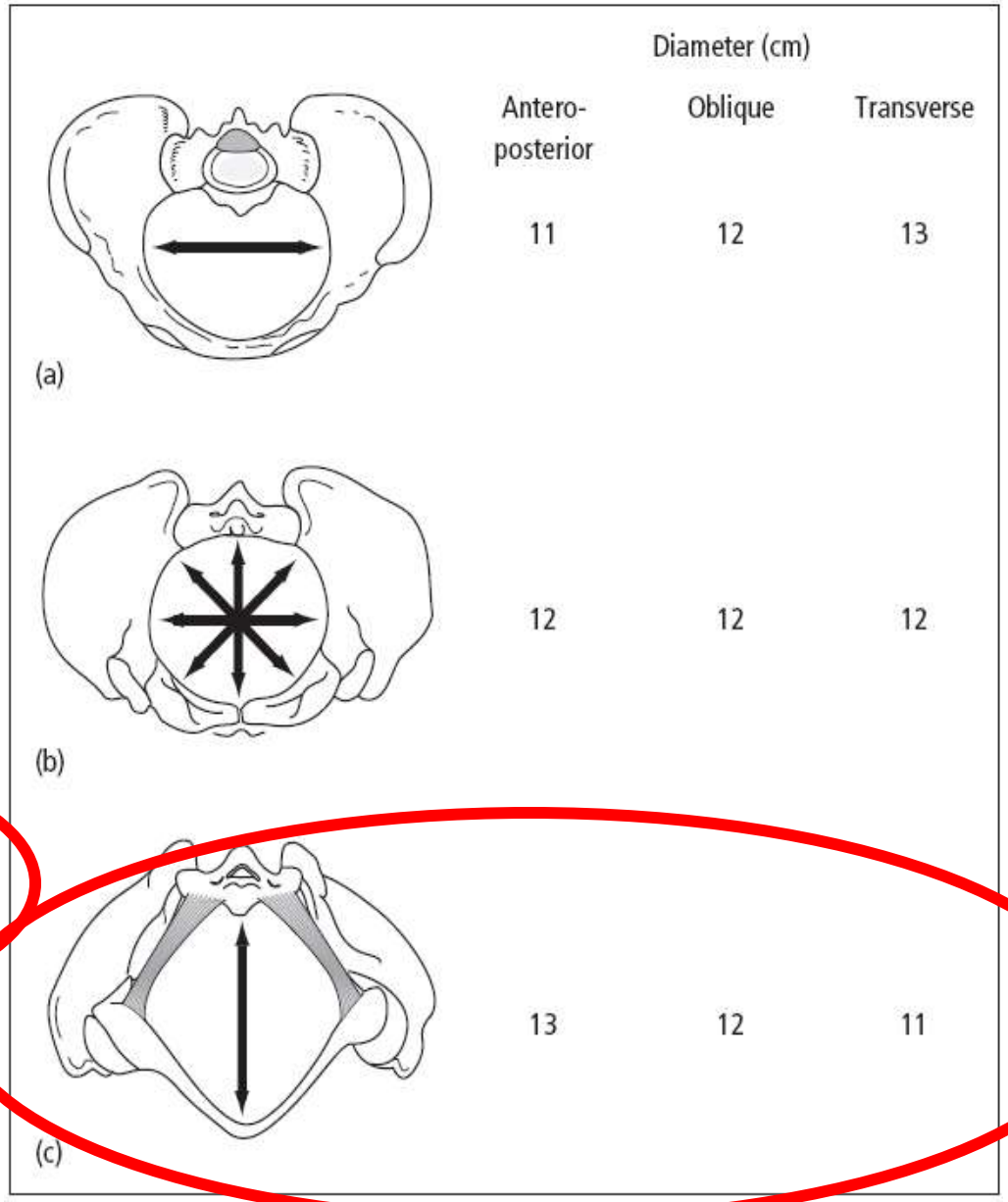


The bony pelvis.

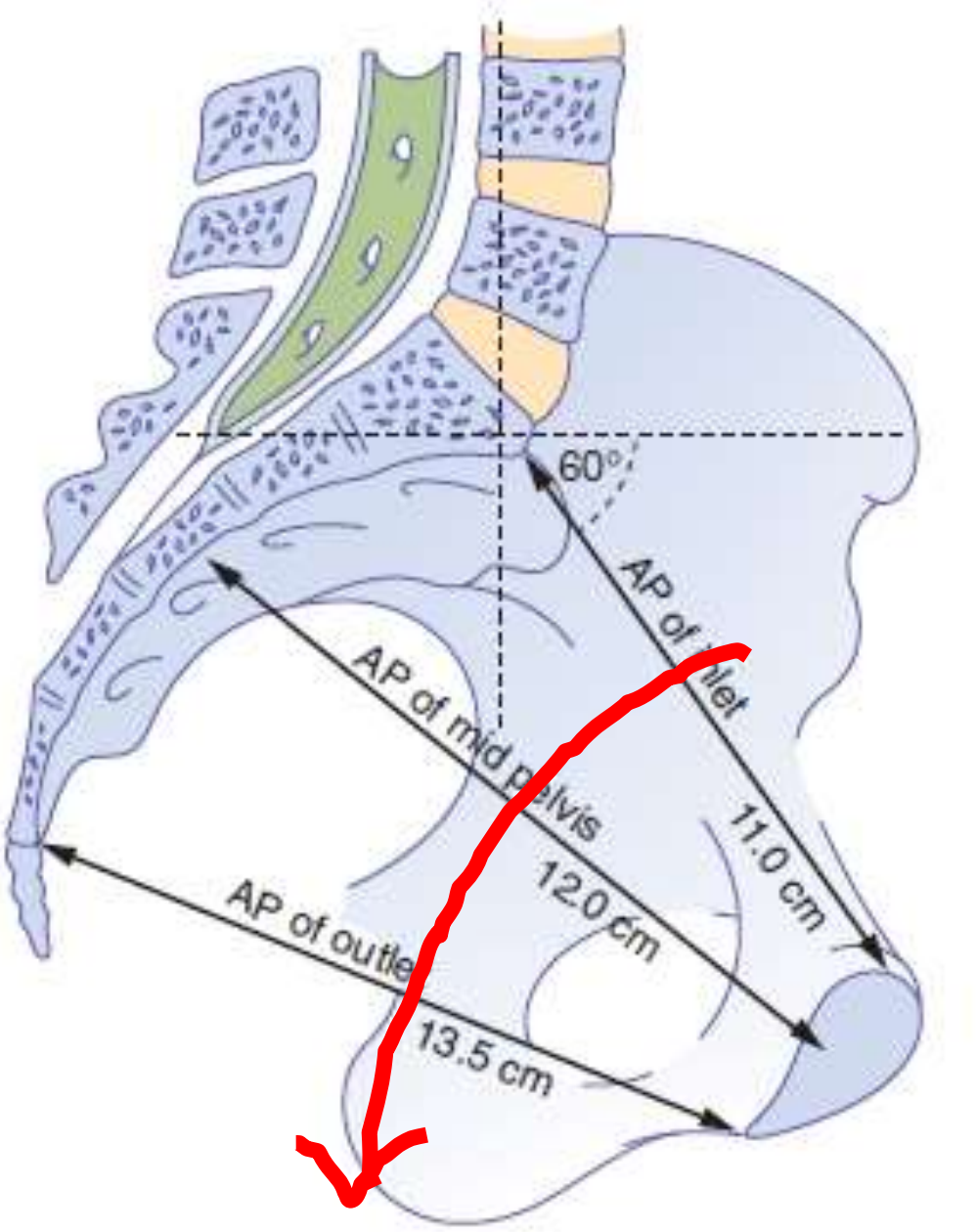
(a) Inlet: Bean shaped.

(b) Mid-cavity: Circular.

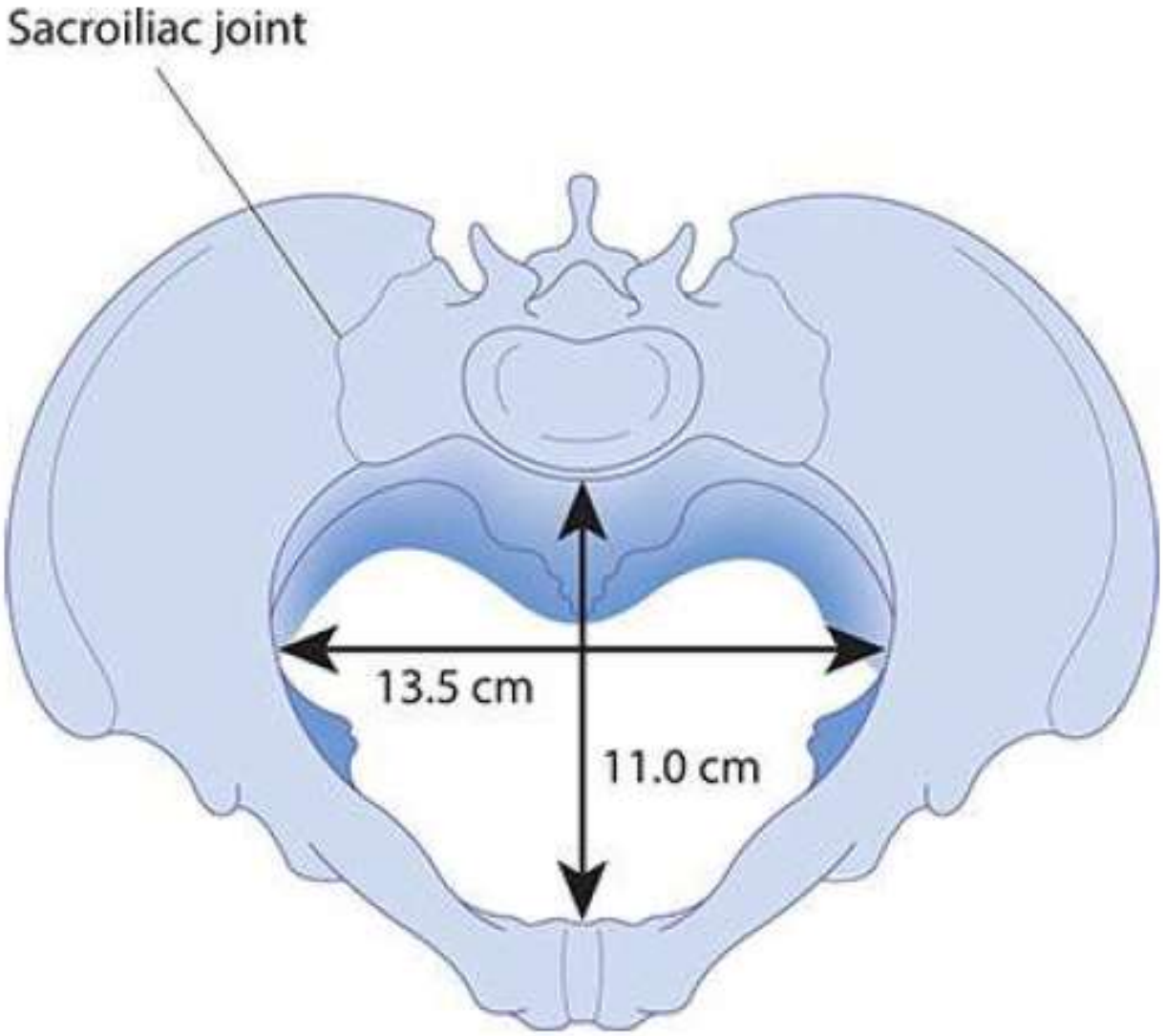
(c)Outlet:Diamond shaped.



The pelvic axis describes imaginary curved line, a path that the centre of the fetal head must take during its passage through the pelvis



The pelvic brim or inlet



The pelvic mid-cavity

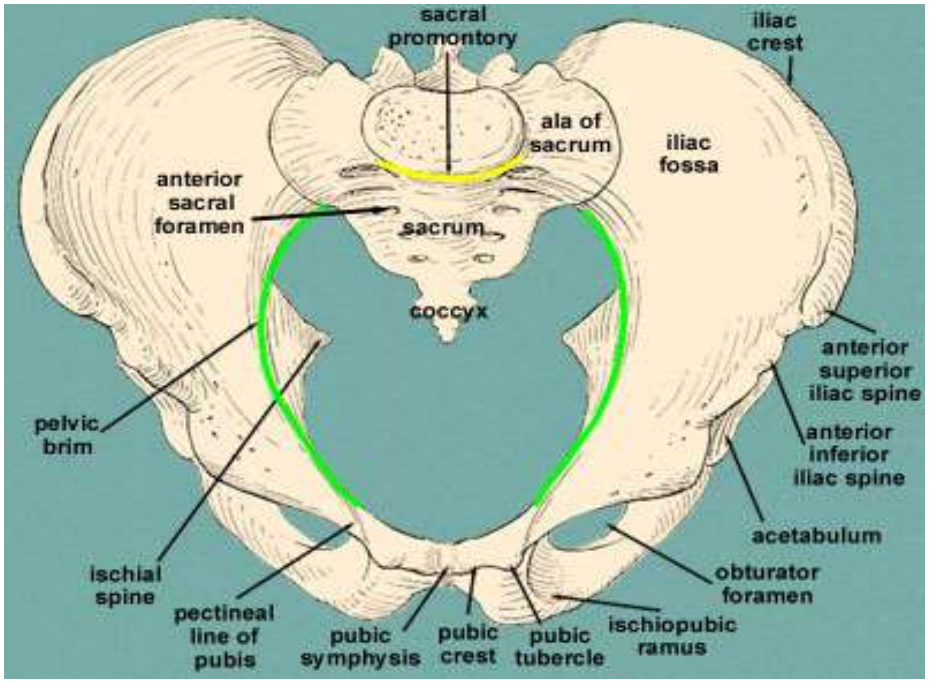
The pelvic mid-cavity can be described as an area bounded in **front** by the middle of the symphysis pubis,

on each side by the pubic bone, the obturator fascia and the inner aspect of the ischial bone and spines,

and **posteriorly** by the junction of the second and third sections of the sacrum.

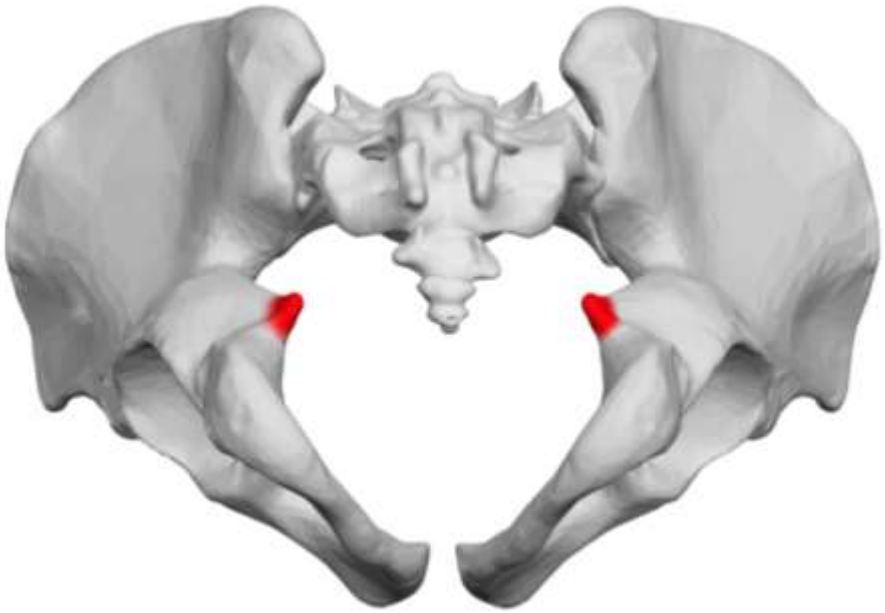
The pelvic cavity is almost rounded
T- diam. = 12 cm
A-P diam. = 12 cm.

Ischial spines (in the midcavity)



View from above

View from below



The ischial spines are palpated vaginally and are used as landmarks to:

1. *assess the descent of the head on vaginal examination (station of the presenting part).*
2. *providing an anaesthetic block to the pudendal nerve which is needed for instrumental delivery.*

The pelvic outlet

The pelvic outlet is bounded

in front by the lower margin of the symphysis pubis,

on each side by the descending ramus of the pubic bone, the ischial tuberosity and the sacrotuberous ligament,

and posteriorly by the last piece of the sacrum.

The AP diameter of the pelvic outlet is 13.5 cm and the transverse diameter is 11 cm

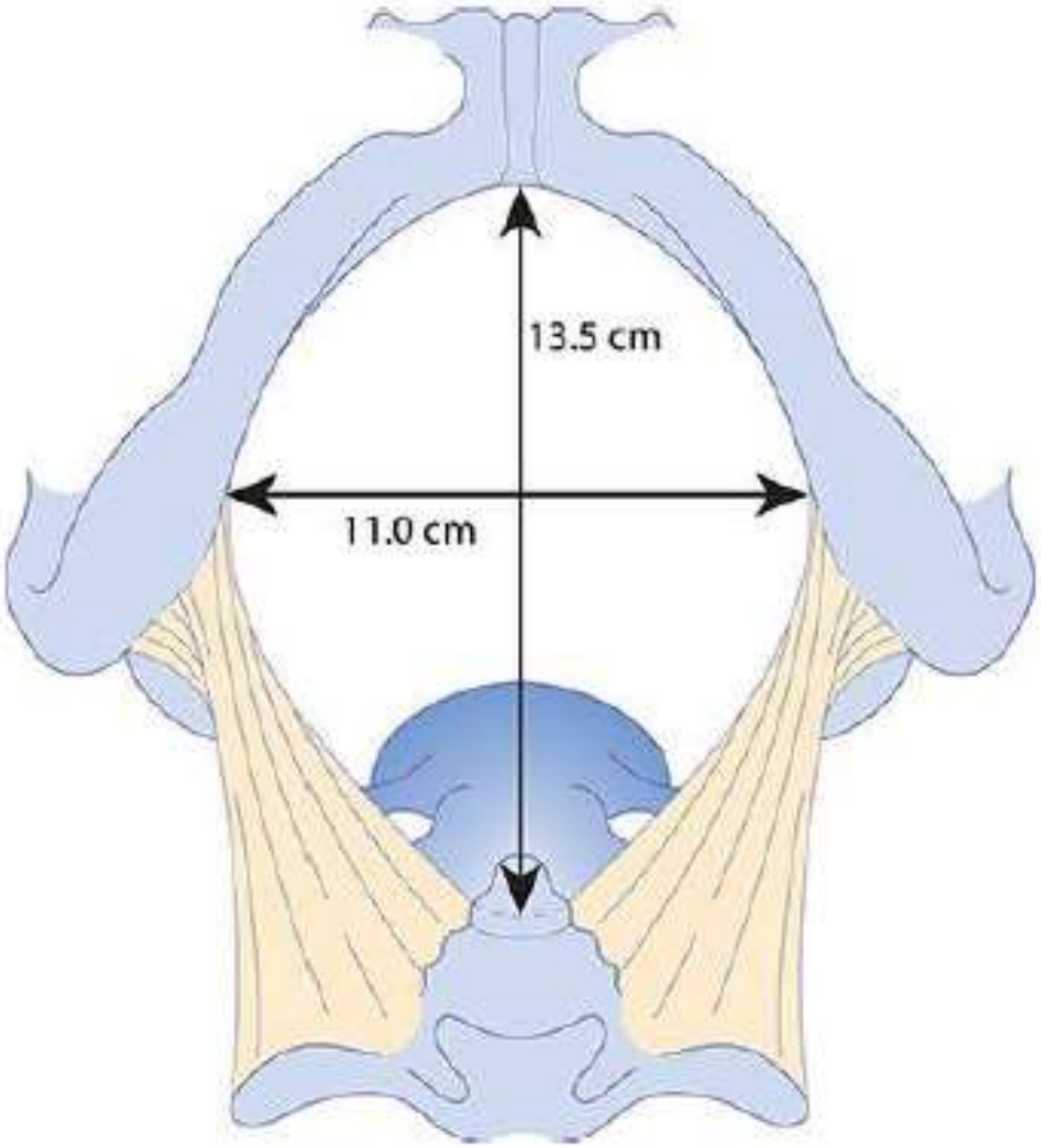


Figure 12.4 The pelvic outlet.

Factors affecting pelvic dimentions

- **Pelvic shape or type**
- **Maternal stature & ethnicity**
- **Previous pelvic fractures and metabolic bone disease, such as rickets**
- **And as the loosening of pelvic ligaments towards the end of the third trimester by relaxin, the pelvis becomes more flexible and these diameters may increase during labour.**
- **Some favourable maternal positions in labour (e.g. squatting or kneeling).**

Pelvic diameters: These represent the space available for the fetal head when it passes through the pelvis during labour

1. the obstetric conjugate of the pelvic inlet (A-P dimension) : 11 cm
2. the bispinous diameter (cavity width): 10.5 cm in the midcavity.
3. the bituberous diameter 11 cm (the pelvic outlet width)
4. the the sacral concavity and its length
5. the subpubic angle (arch)

Pelvic shapes (types)

We have 4 types or shapes of the bony pelvis and these are:

gynecoid
android
anthropoid
platypelloid.

And their associated obstetric outcomes

Gynecoid pelvis

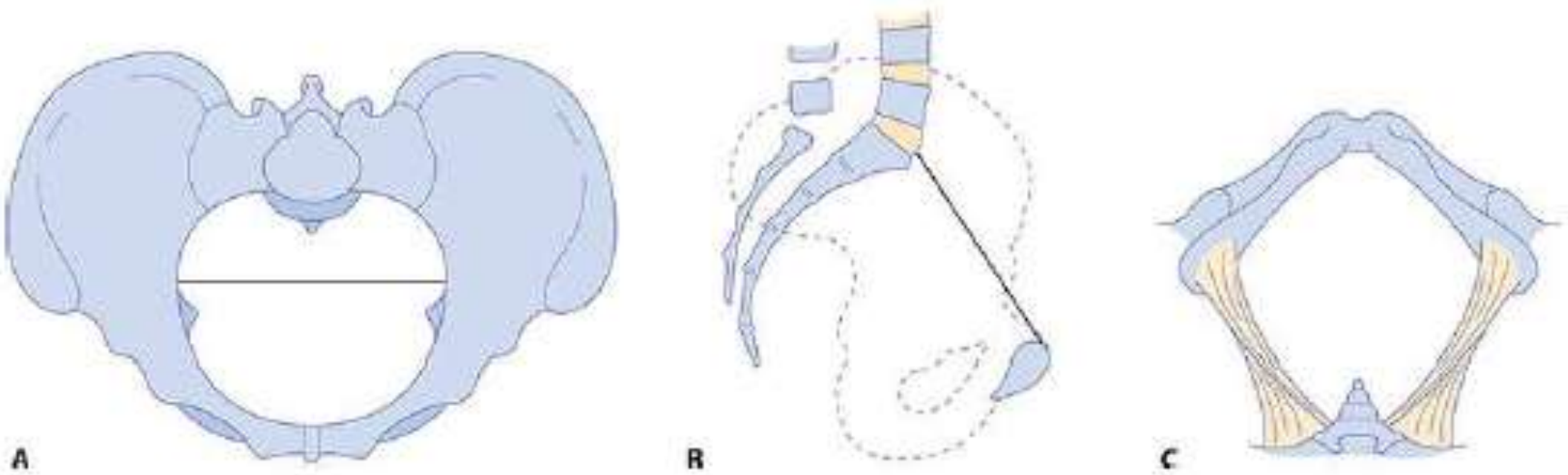


Figure 12.5 The gynaecoid pelvis: (**A**) brim; (**B**) lateral view; (**C**) outlet.

Is the most common 50% associated with high success

Android pelvis

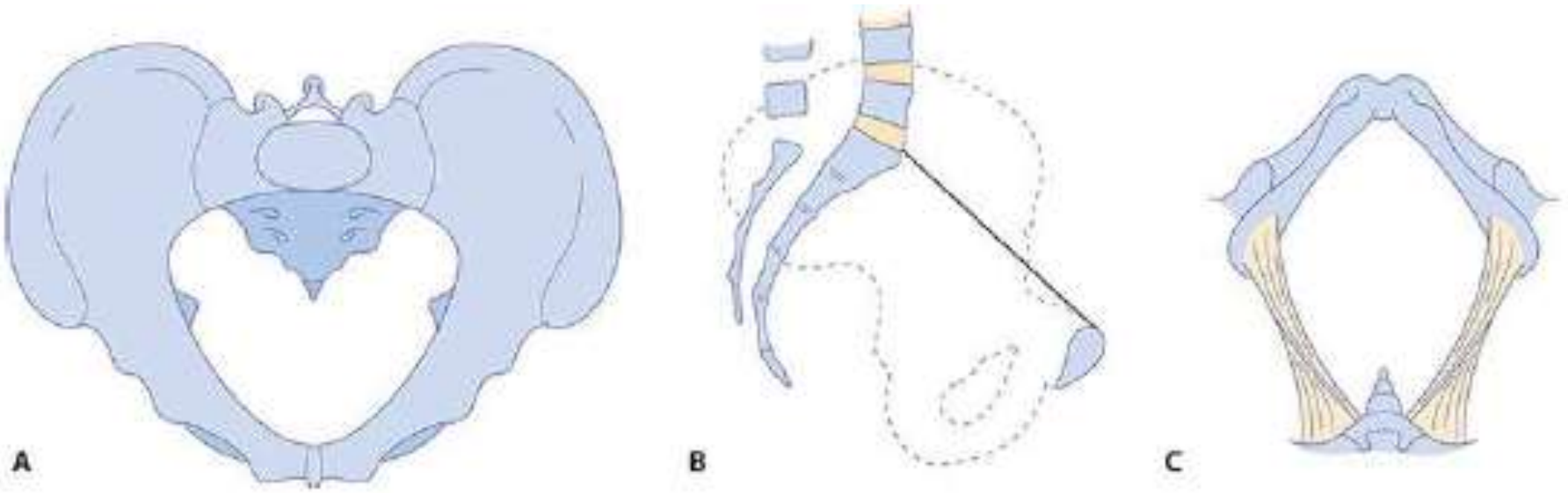


Figure 12.6 The android pelvis: (**A**) brim; (**B**) lateral view; (**C**) outlet.

Comprise to 30% & it predispose to failure of rotation and deep transverse arrest

anthropoid pelvis

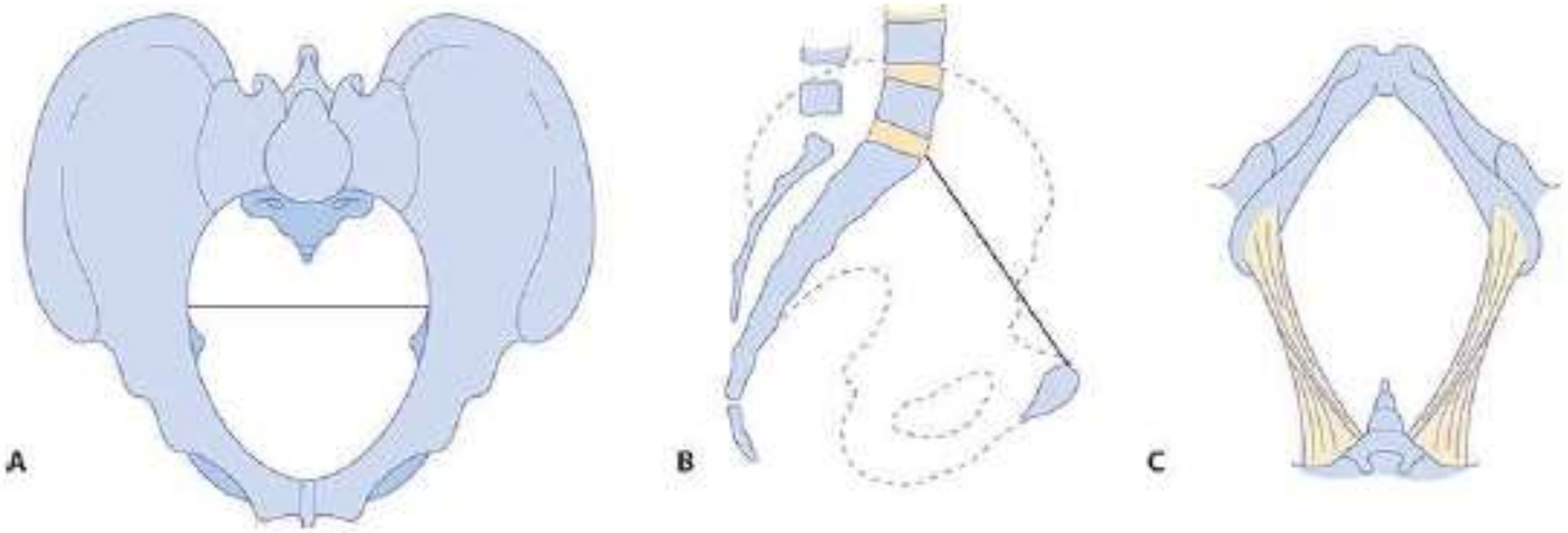


Figure 12.7 The anthropoid pelvis: (**A**) brim; (**B**) lateral view; (**C**) outlet.

It predispose to an occipito-posterior (OP) position.

Platypelloid pelvis

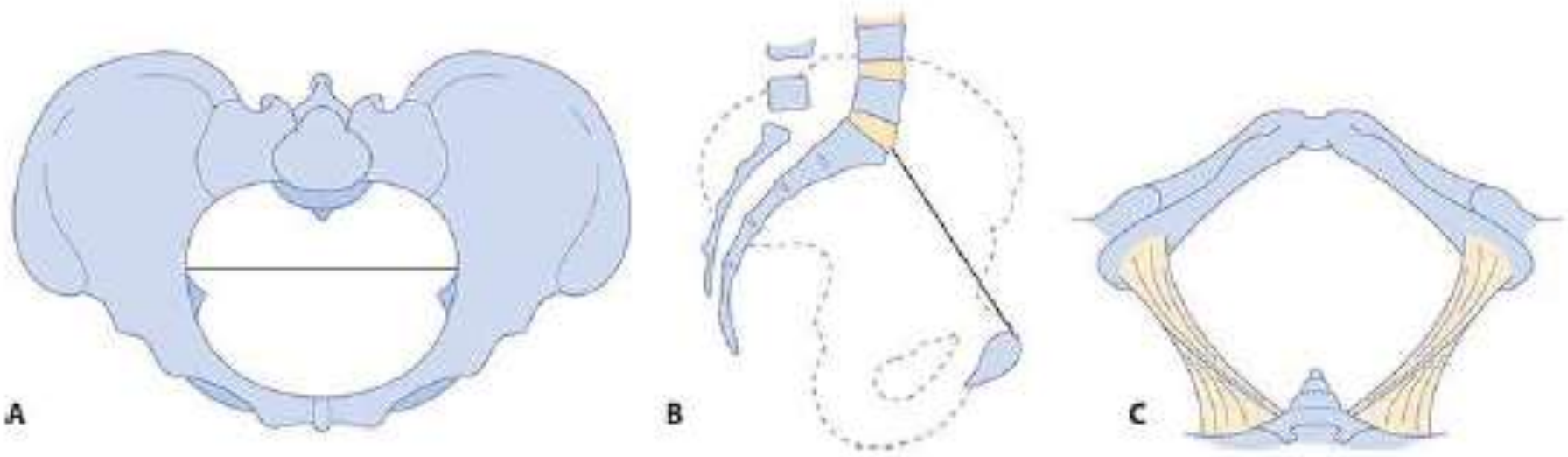


Figure 12.8 The platypelloid pelvis: (**A**) brim; (**B**) lateral view; (**C**) outlet.

is associated with an increased risk of obstructed labour due to failure of the head to engage, rotate or descend.

The perineum

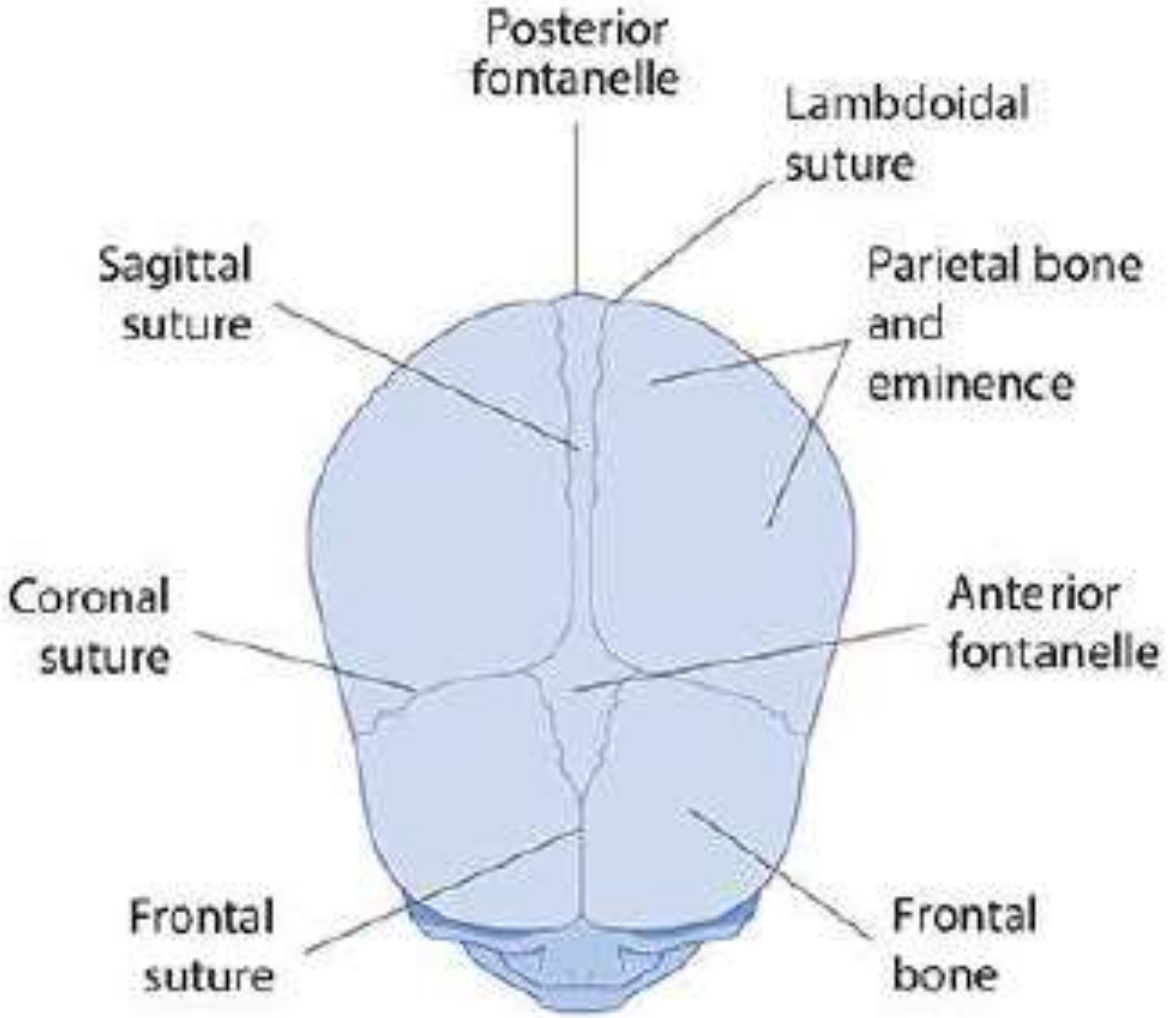
The final obstacle against the desent of the fetus during labour is the perineum. It may be involved in a second-degree perineal tear and an episiotomy in primiparous women .

While in multiparous it may remain intact during vaginal delivery

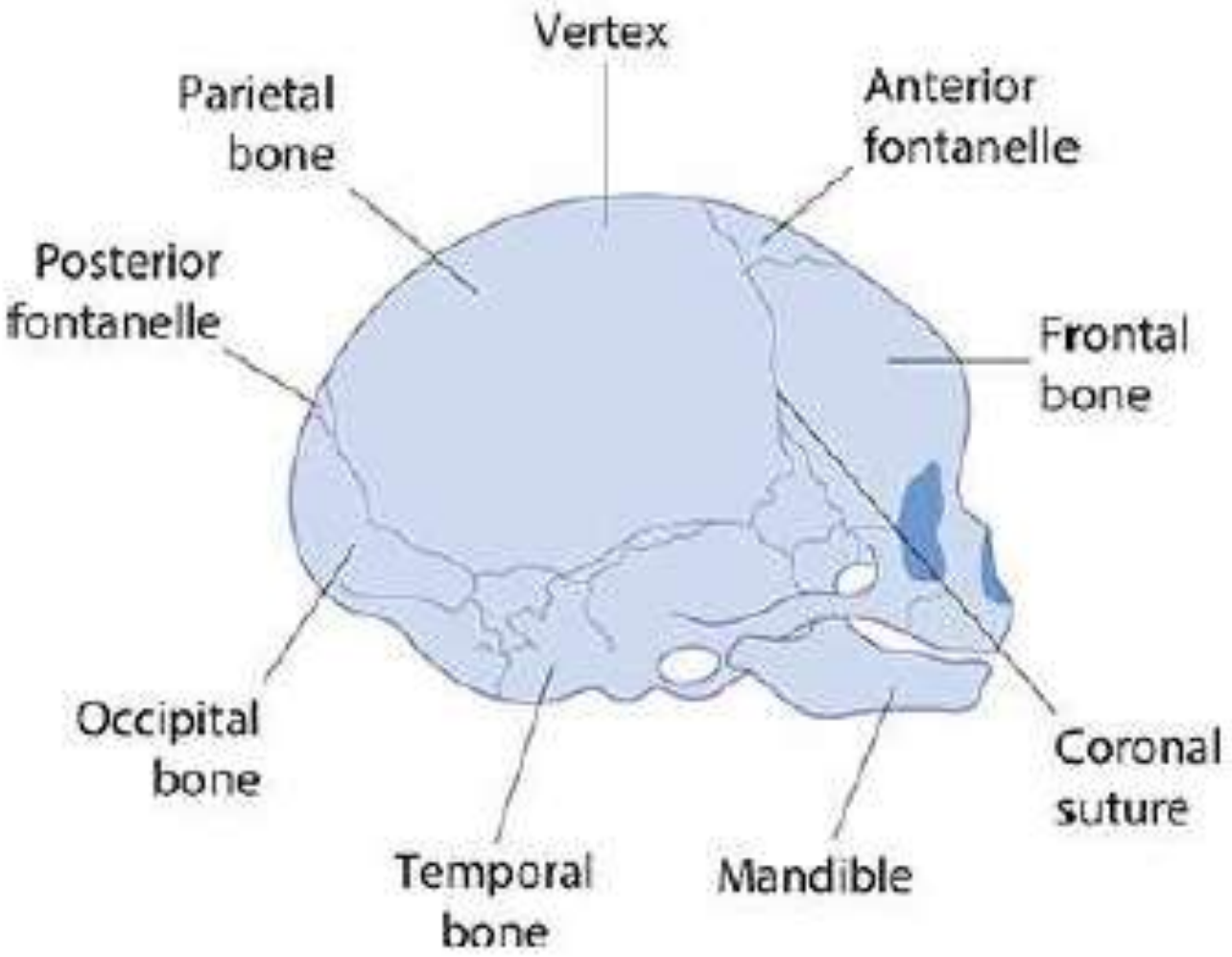
Dimensions of the fetal skull

- **The fetal head is the largest and the least compressible part of the fetus**
- **The fetal skull consists of a base and a vault (cranium) which consists of the occipital, parietal, frontal and temporal bones**

The fetal skull from the superior view

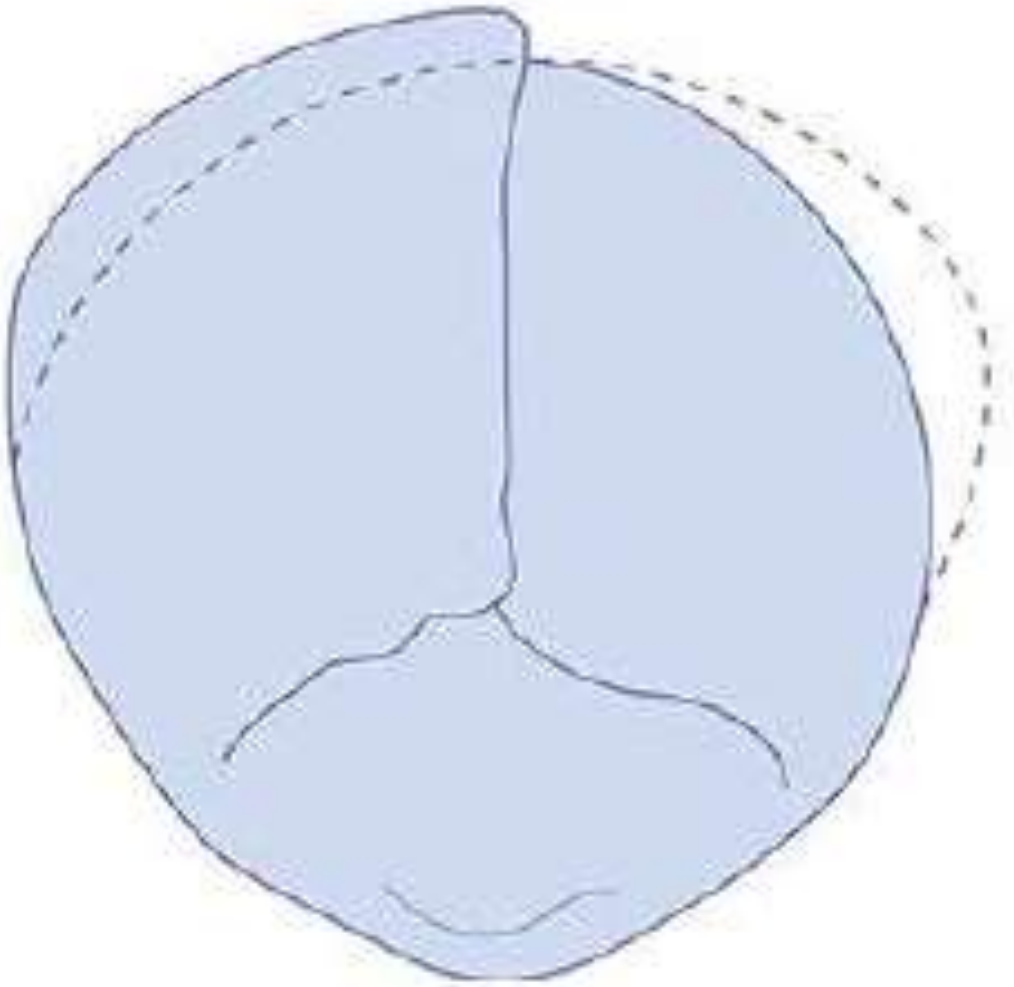


The fetal skull from the lateral view



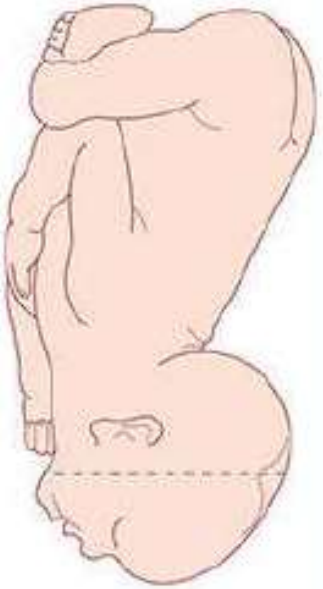
these are easily compressible and interconnected by membranes and these features allow molding to occur which means the overlap of these bones under pressure and changing their shape to conform to maternal pelvis during vaginal delivery

moulding of the fetal skull



The effect of fetal attitude on the presenting diameter

Flexed → Extended

Attitude	Well flexed	Less well flexed (partially extended) or deflexed	Extended 'brow presentation'	Hyperextended 'face presentation'
Diameter	Suboccipito-bregmatic	Occipito-frontal	Occipito-mental	Submento-bregmatic
Measurement	9.5 cm	11.5 cm	13.0 cm	9.5 cm
				

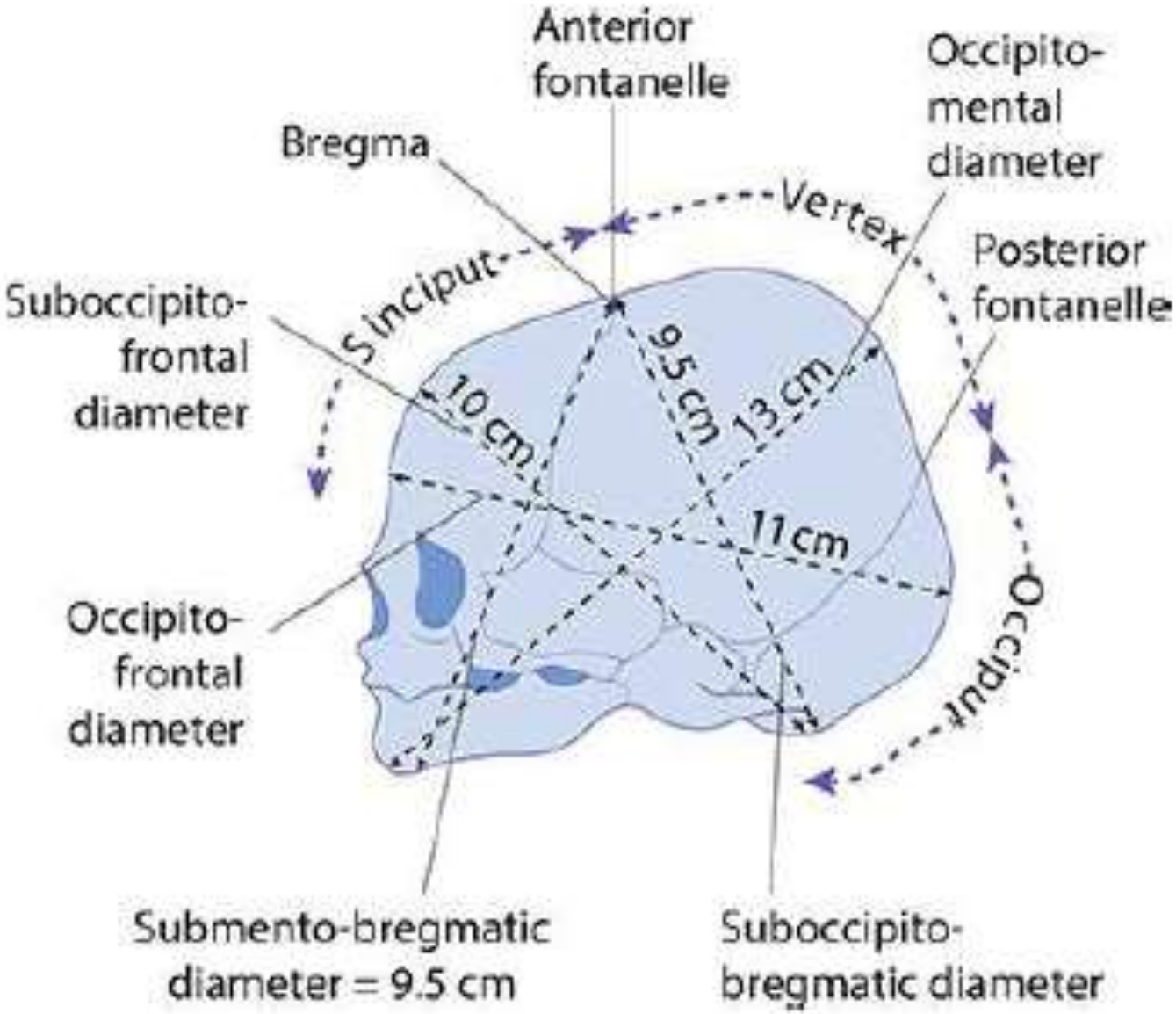


Figure 12.13 The diameters of the fetal skull.