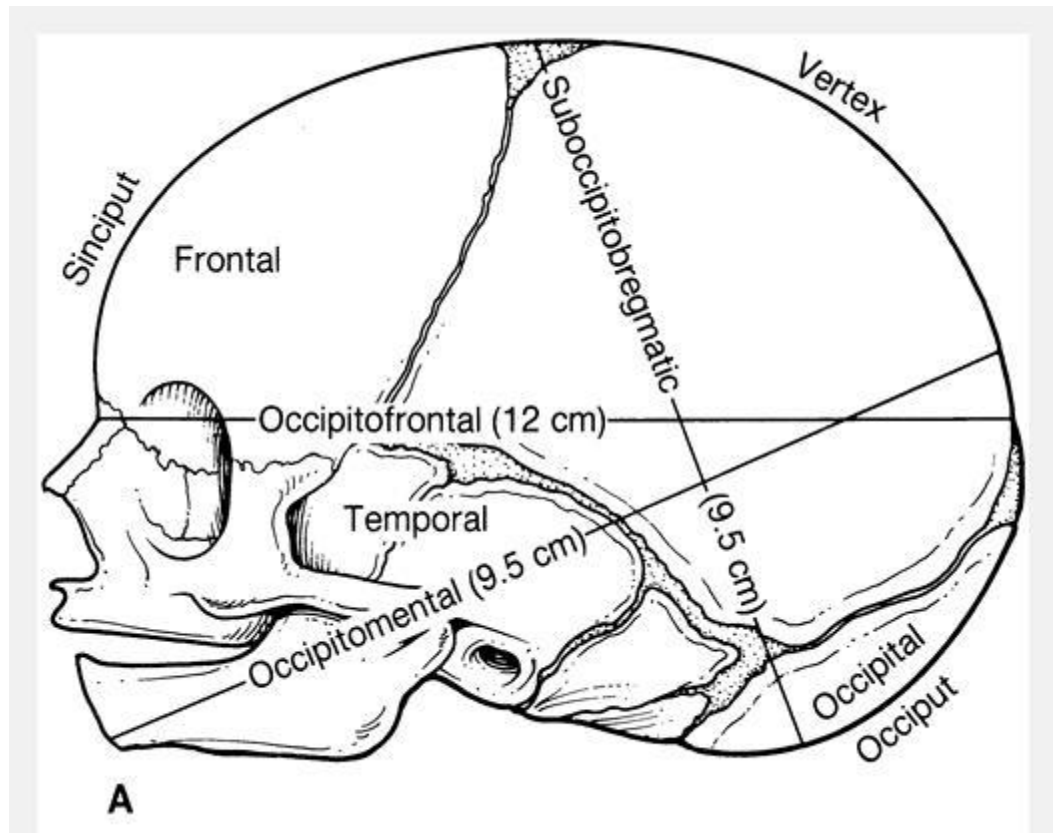


Maternal bony pelvis and fetal head



Objectives of this lecture

- 1. Introduction to normal labour and vaginal delivery passages, passenger, and power.**
- 2. The student should know the types of female pelvis.**
- 3. 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.**
- 4. What are the methods for assessment of pelvic dimensions.**
- 5. Know the dimensions of the fetal skull.**
- 6. Understand how the attitude of the fetal head effect these dimensions.**

- *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

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.

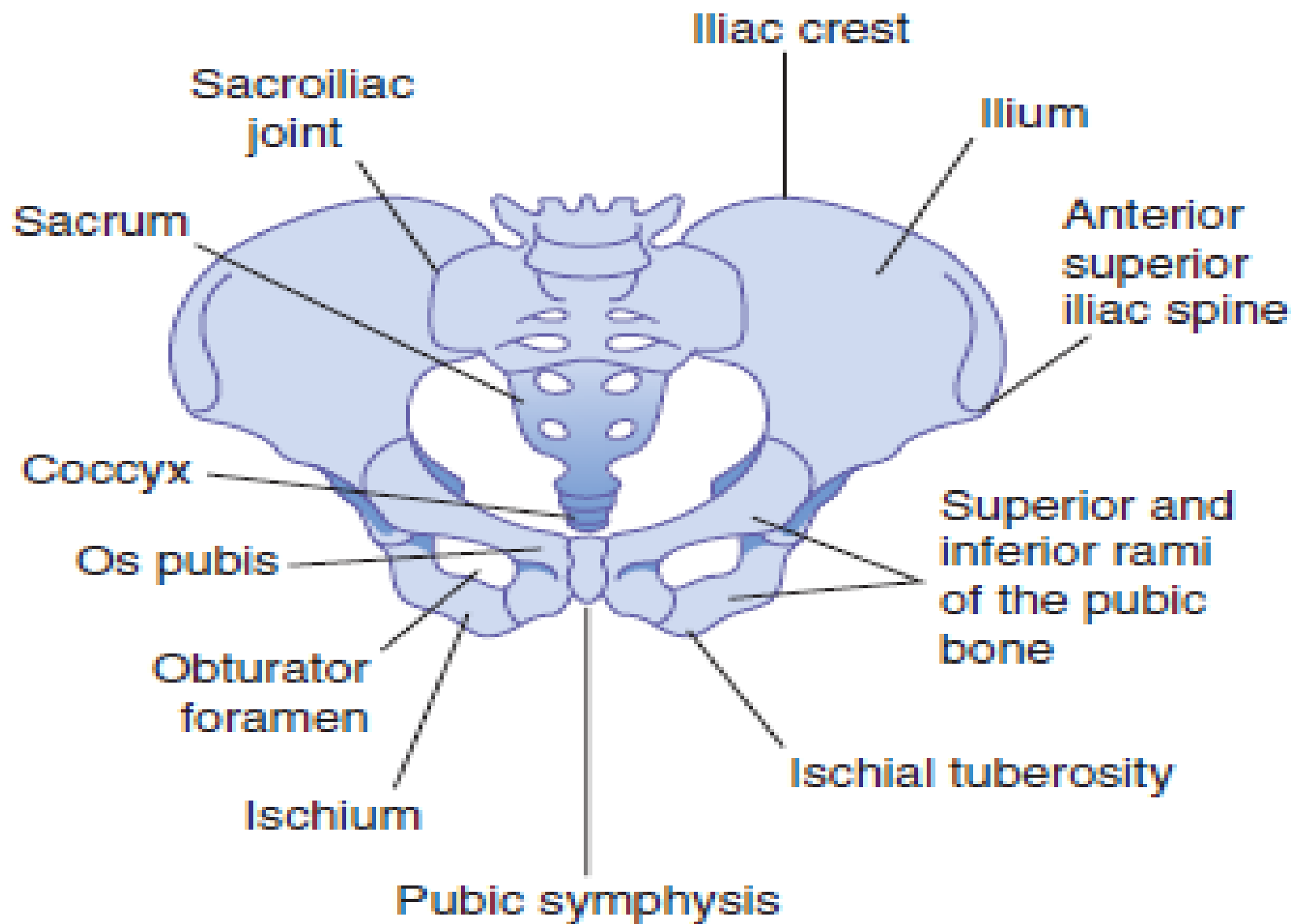


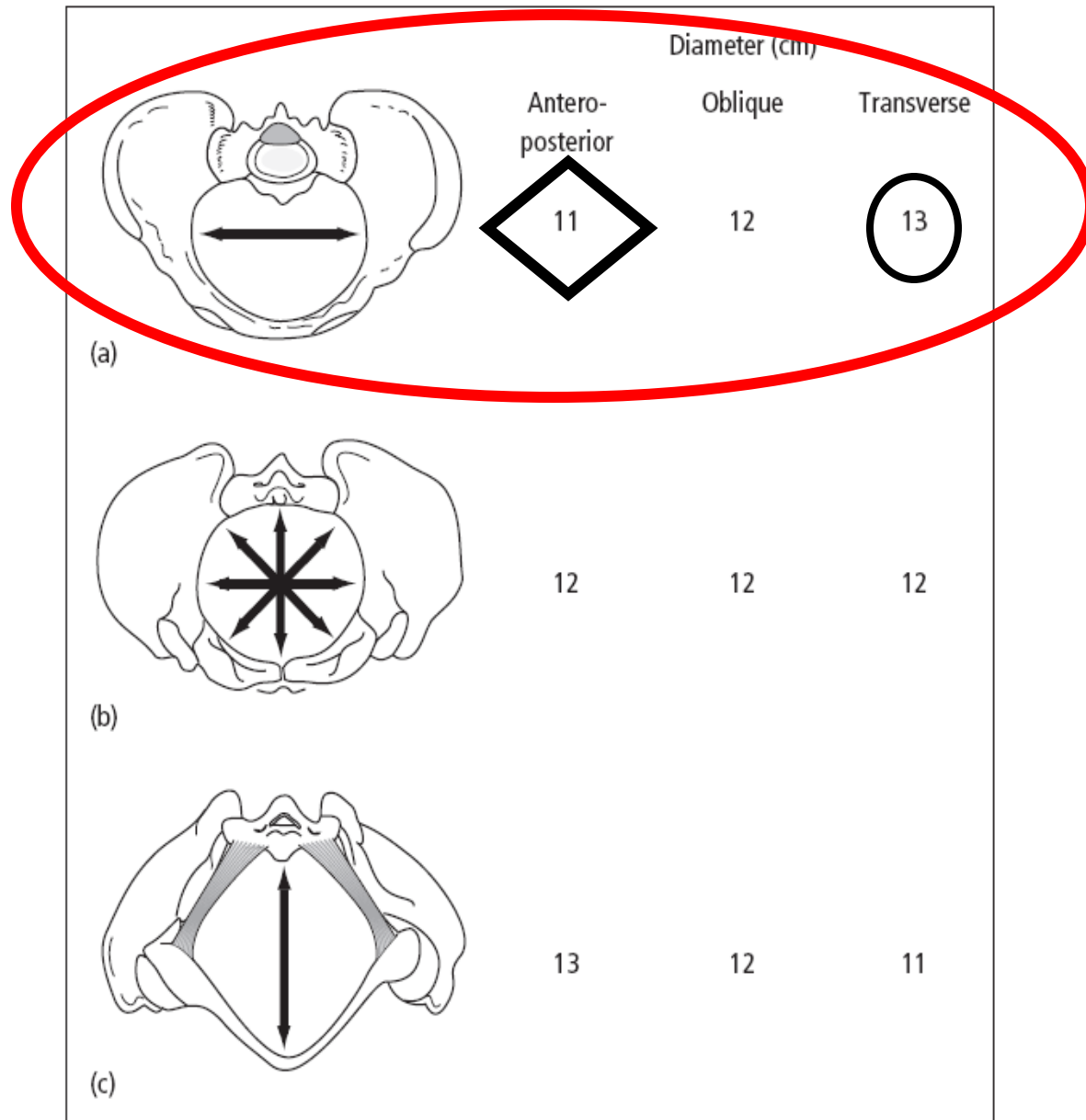
Figure 14.1 The bony pelvis

The bony pelvis.

(a) Inlet: Bean shaped.

(b) Mid-cavity: Circular.

(c) Outlet: Diamond shaped.



The pelvic brim or inlet

Sacroiliac joint

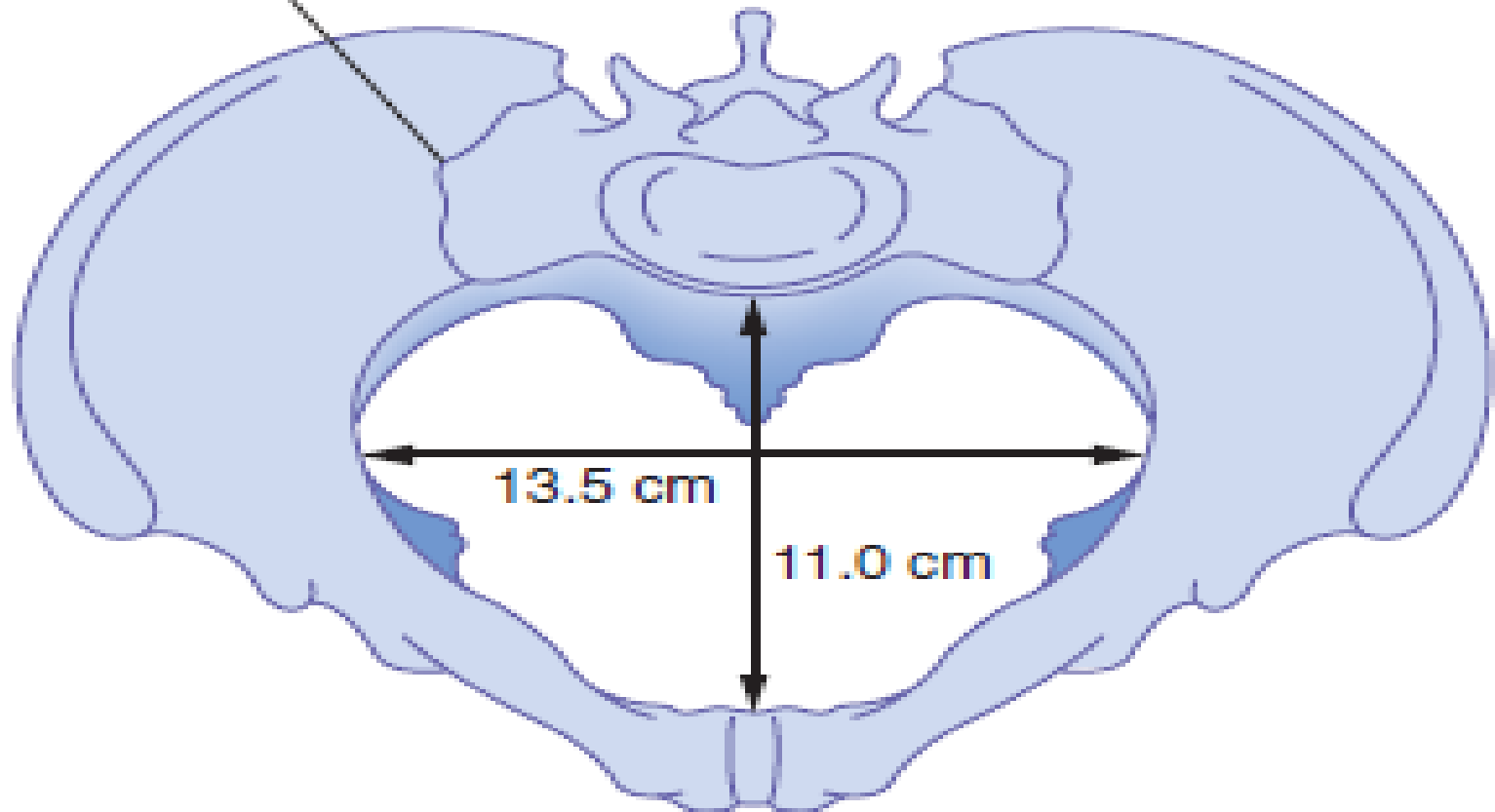
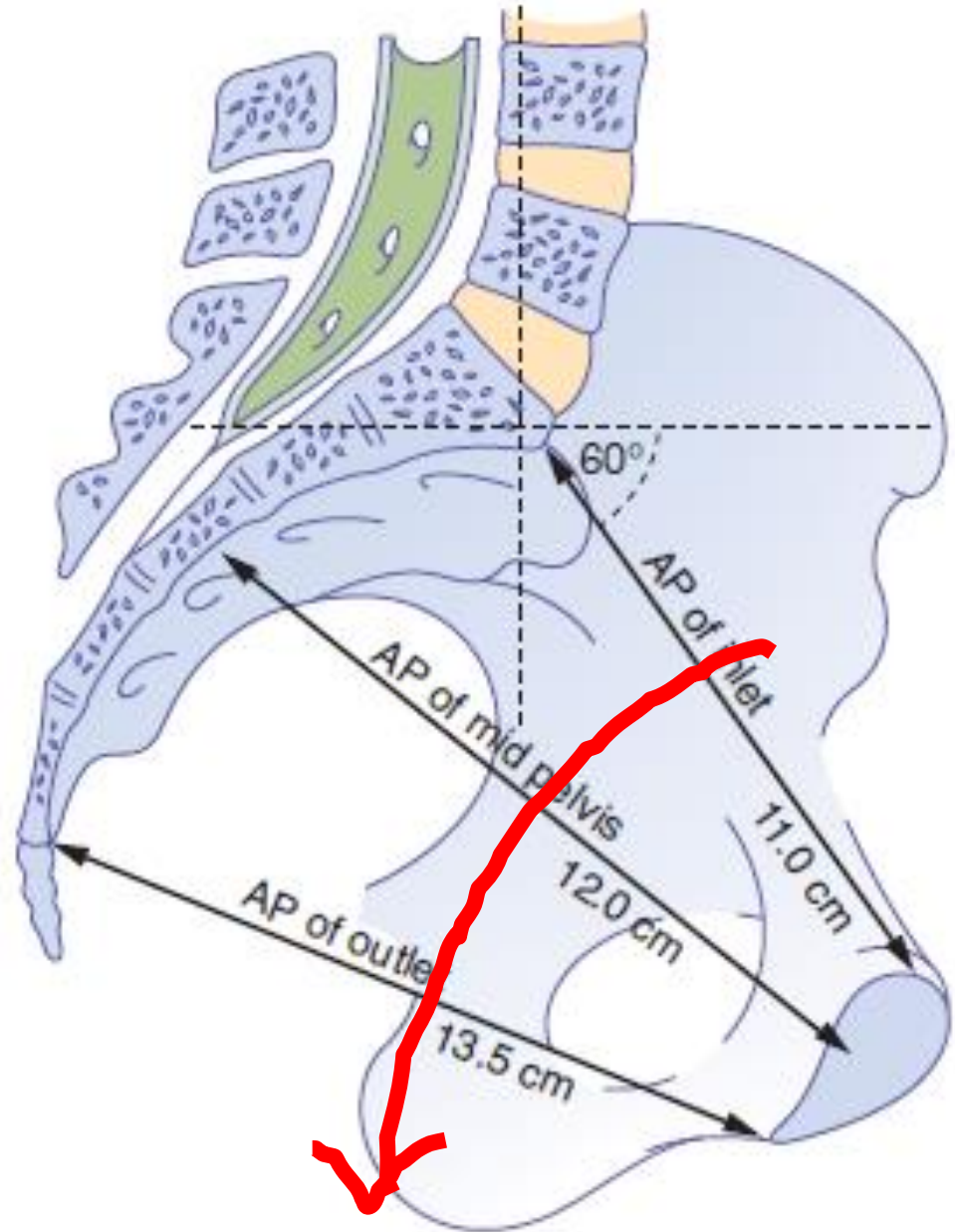


Figure 14.2 The pelvic brim

**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 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 cavity is almost round, as the transverse and anterior diameters are similar at 12 cm.

The ischial spines are palpated vaginally and are used as landmarks to assess the descent of the head on vaginal examination (station). They are also used as landmarks for providing an anaesthetic block to the pudendal nerve.

The bony pelvis.

(a) Inlet: Bean shaped.

(b) Mid-cavity: Circular.

(c) Outlet: Diamond shaped.

	Diameter (cm)		
	Antero-posterior	Oblique	Transverse
(a)	11	12	13
(b)	12	12	12
(c)	13	12	11

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

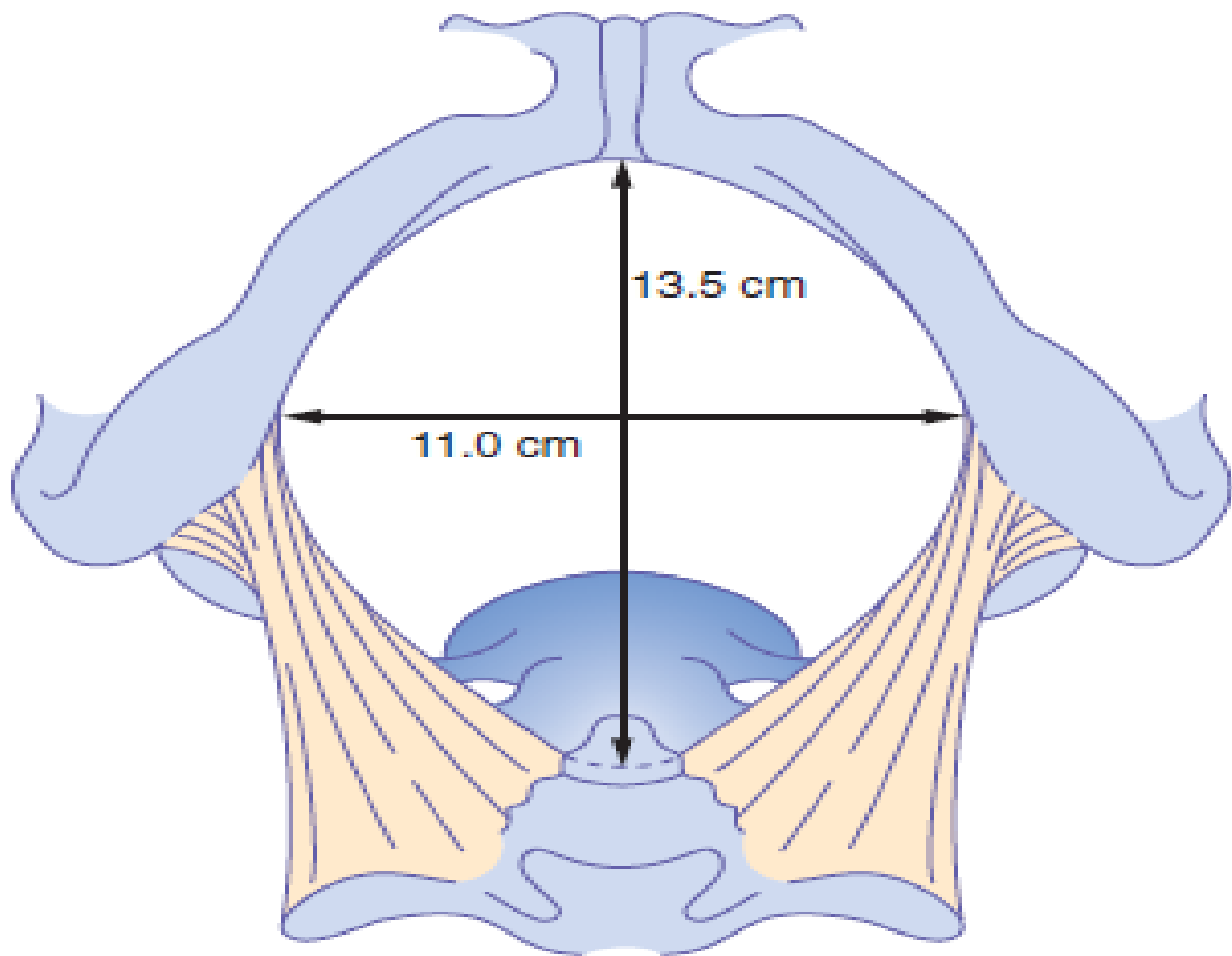


Figure 14.4 The pelvic outlet

The bony pelvis.

(a) Inlet: Bean shaped.

(b) Mid-cavity: Circular.

(c) Outlet: Diamond shaped.

	Diameter (cm)		
	Antero-posterior	Oblique	Transverse
(a)	11	12	13
(b)	12	12	12
(c)	13	12	11

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: 11 cm**
- 2. the bispinous diameter: 10.5 cm in the midcavity.**
- 3. the bituberous diameter 11 cm in the pelvic outlet**
- 4. the curve and length of the sacrum**
- 5. and finally the subpubic angle**

Pelvic shapes (types)

We have 4 types or shapes of the bony pelvis and these are: the gynecoid, android, anthropoid, and finally the platypelloid.

- **1- The gynecoid:** it is the classic female pelvis and is seen in about 50% of all the women and characterized by the following:
- Rounded to bean shape inlet, side walls are straight, ischial spines are of average prominence, well curved sacrum, wide subpubic arch , Suitable for vaginal delivery

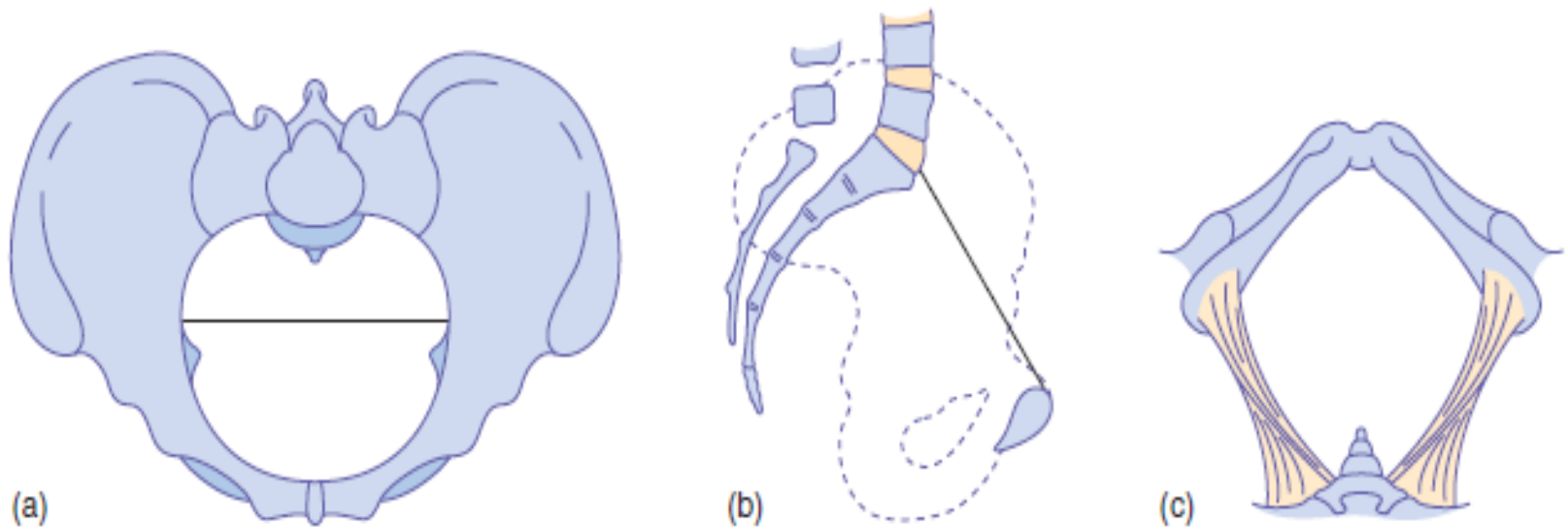


Figure 14.5 The gynaecoid pelvis: (a) brim, (b) lateral view, (c) outlet

- **android pelvis**: which is the typical male pelvis and found in < than 30% of women and characterized by:
- Heart shape inlet (triangular), convergent side wall (funnel shape) with prominent spines, straight sacrum, and narrow subpubic arch.
- Associated with deep transverse arrest

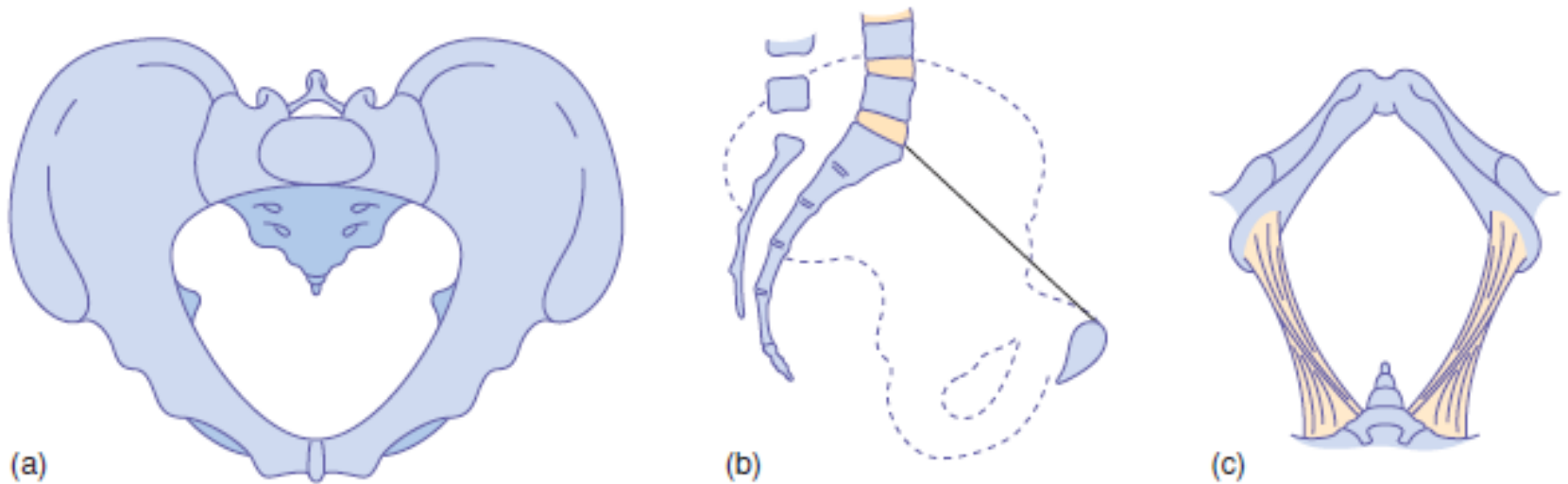


Figure 14.6 The android pelvis: (a) brim, (b) lateral view, (c) outlet

- **anthropoid pelvis:** is found in 20% of women and
- **Associated with occipito- posterior position during labour**

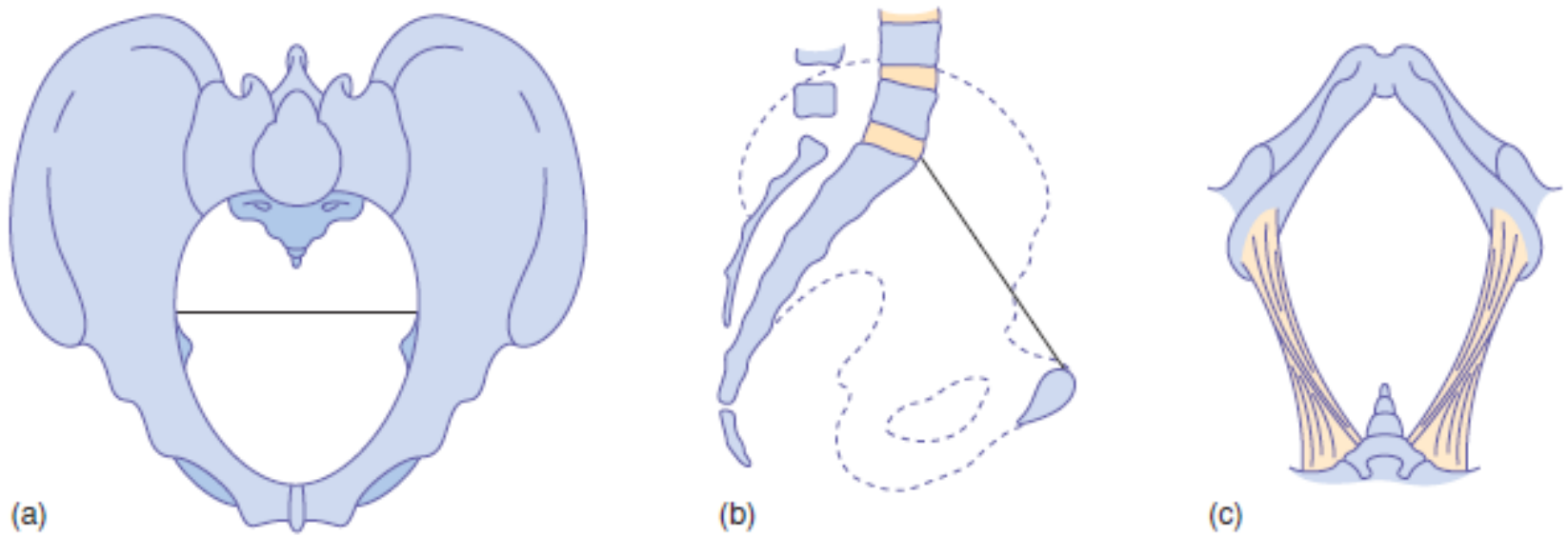


Figure 14.7 The anthropoid pelvis: (a) brim, (b) lateral view, (c) outlet

- **platypelloid pelvis:** which is a flattened gynecoid pelvis and seen in 3% of women and is associated with obstructed labour

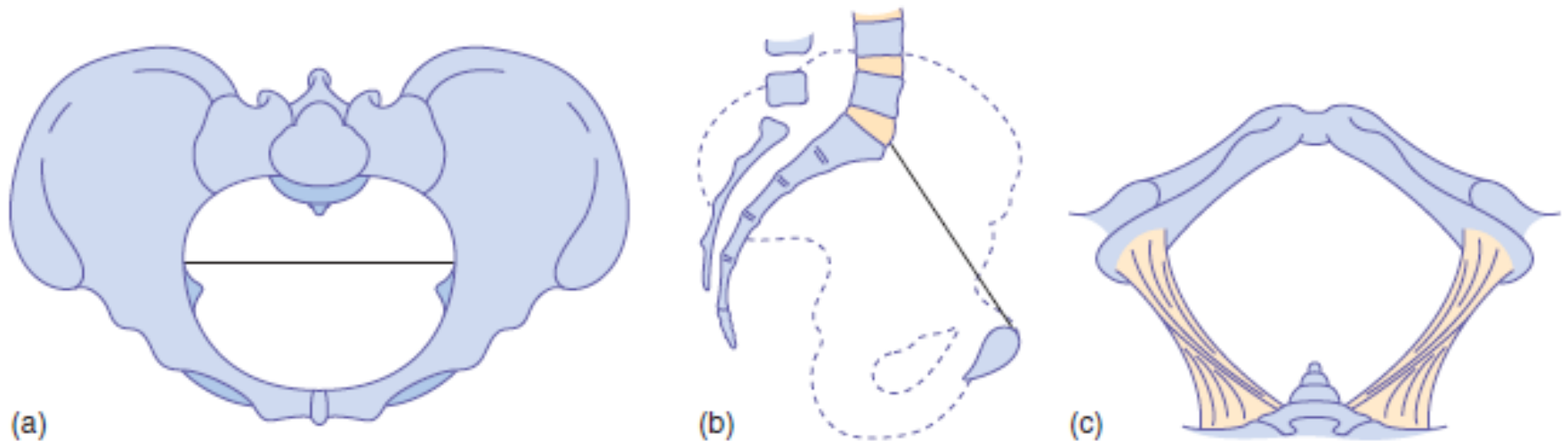
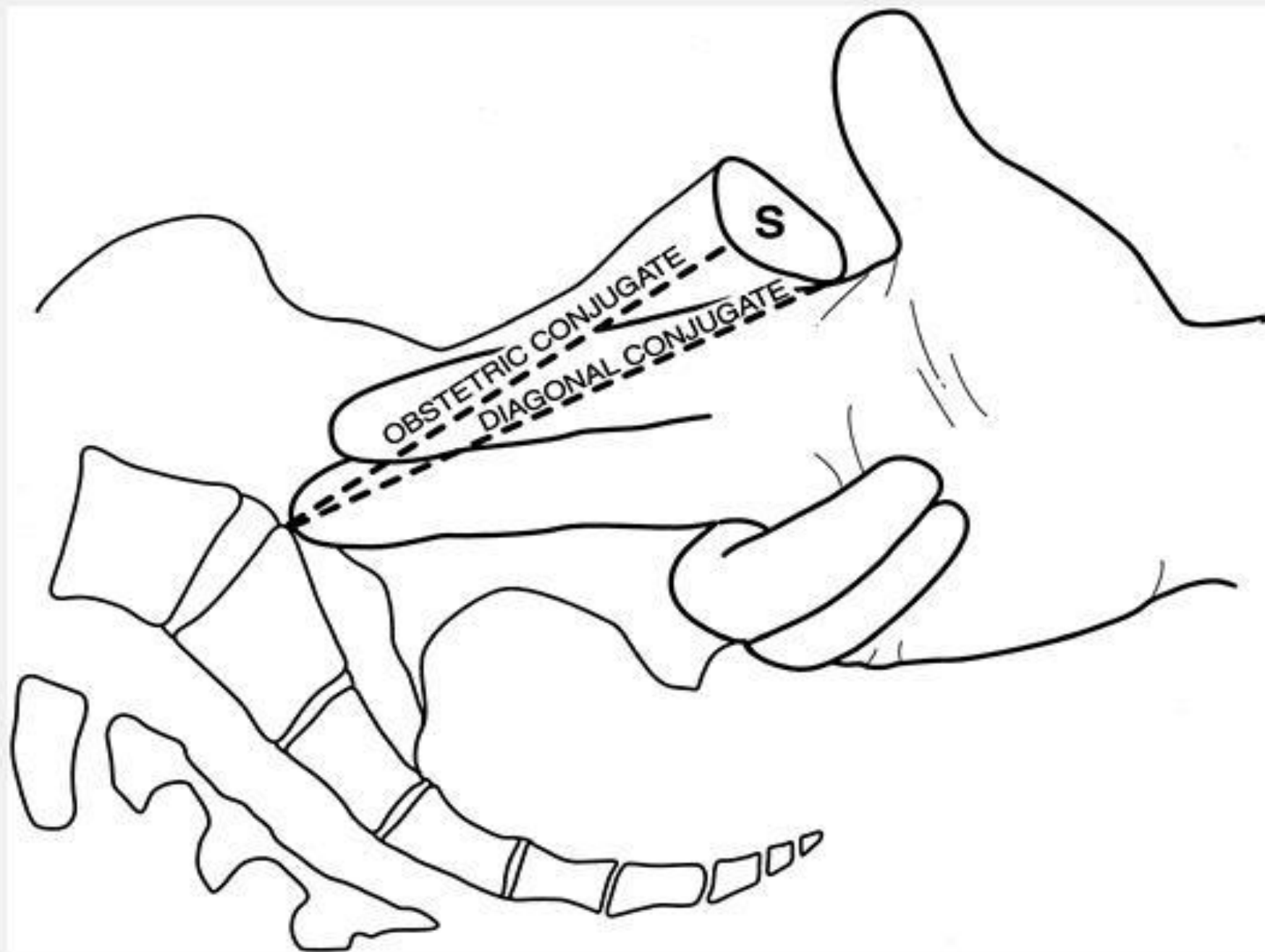
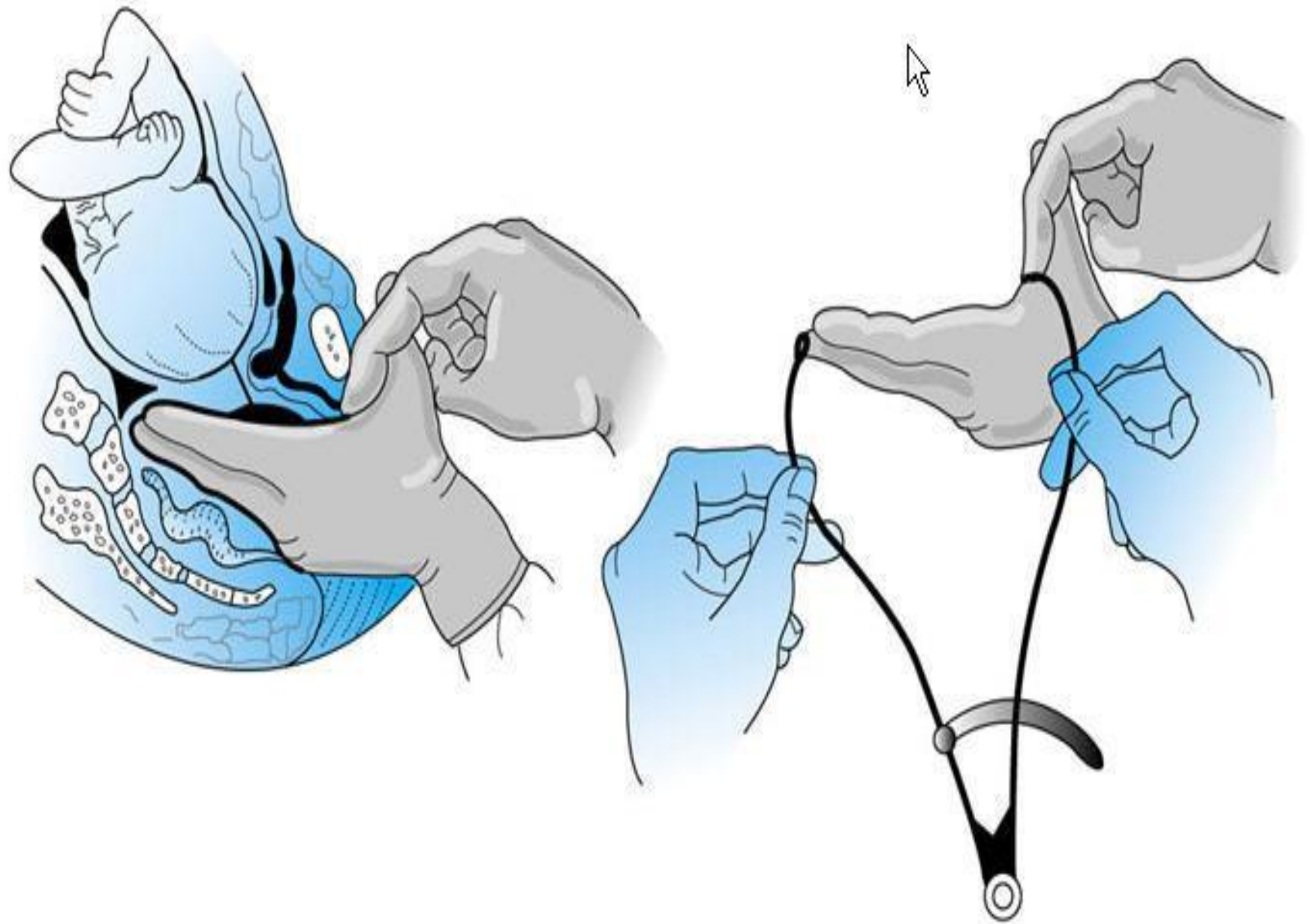


Figure 14.8 The platypelloid pelvis: (a) brim, (b) lateral view, (c) outlet

Clinical pelvimetry:

The diameters that can be assessed clinically are: the obstetric conjugate of the inlet by clinical assessment of the diagonal conjugate when the tip of the middle finger can not meet the promontory of the sacrum (while the 2 fingers are passed in the vagina and the index finger meets the pubis) then we subtract 1.5-2 cm will corresponds the obstetric conjugate





Measurement of the diagonal conjugate (DC)

Then we assess the curvature of the sacrum by palpating its anterior surface.

Then the midpelvis is assessed but it is difficult to do it clinically unless the pelvic side walls are apparently convergent which indicate narrow pelvic cavity

the bispinous dimension also can be assessed by palpating the prominence of the spines, in addition the width of the sacrosiatic notch should be assessed.

And the final step is the assessment of the outlet by placing a fist between the ischial tuberosities, a dimension of 8.5 cm is adequate transverse diameter. And the subpubic arch of less than 90 degrees usually associated with narrow midcavity and outlet

The perineum

The final obstacle to be negotiated by the fetus during labour is the perineum. The perineal body is a condensation of fibrous and muscular tissue lying between the vagina and the anus. It receives attachments of the posterior ends of the bulbo-cavernous muscles, the medial ends of the superficial and deep transverse perineal muscles, and the anterior fibres of the external anal sphincter. It is always involved in a second-degree perineal tear and an episiotomy.

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**

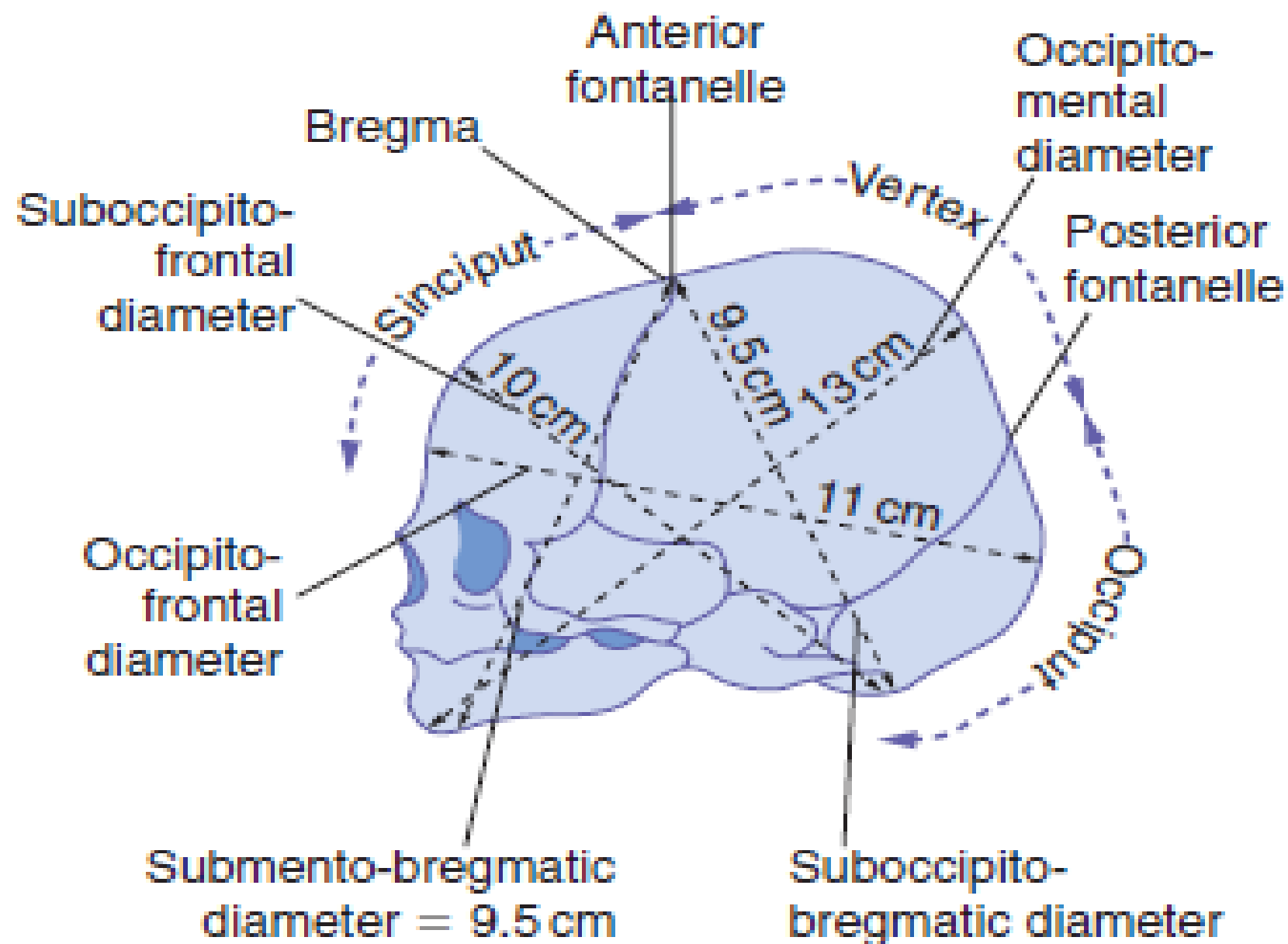


Figure 14.13 The diameters of the fetal skull

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

- You have to know many terms:

- *fontanelle [anterior (bregma)

- *and posterior (lambda)],

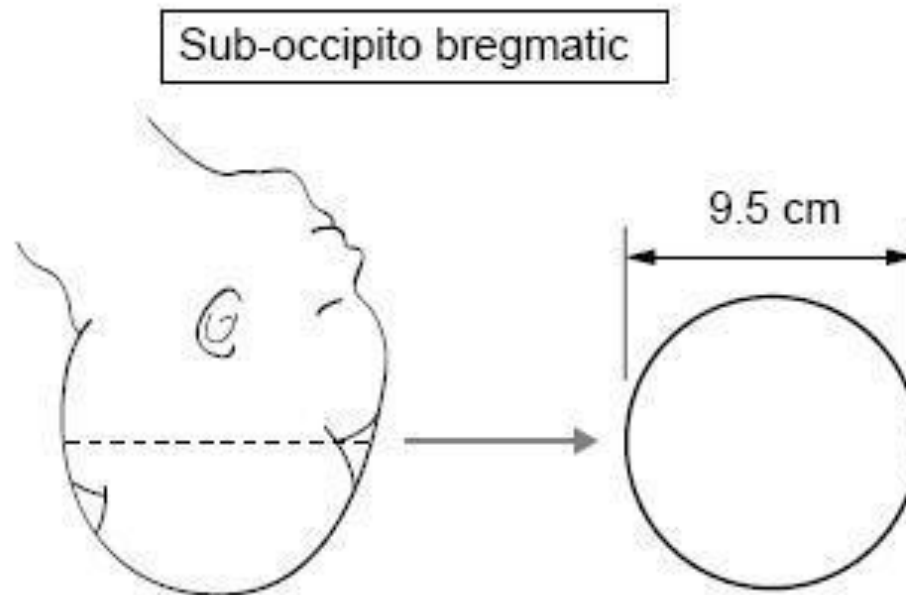
- *nasion,

- *glabella,

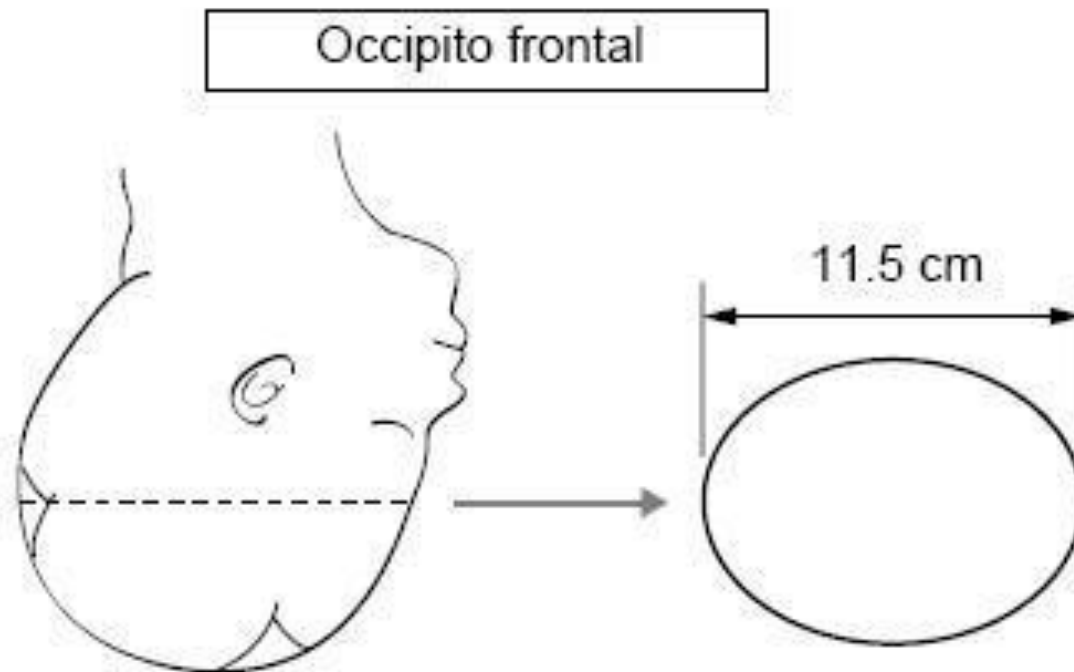
- *vertex,

- *and the occiput

suboccipitobregmatic (9.5) cm this is the presenting anteroposterior diameter when the head is well flexed. It extends from the undersurface of the occipital bone to the center of the bregma.



Occipitofrontal (11) cm: when the head is deflexed. Extend from the external protuberance of the occipital bone to the glabella.

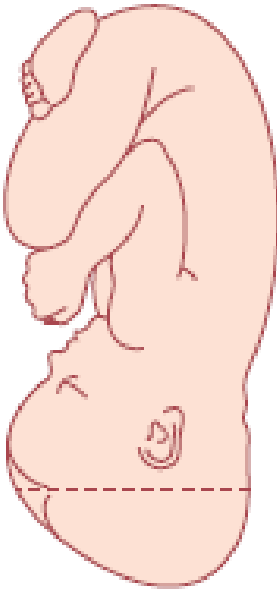

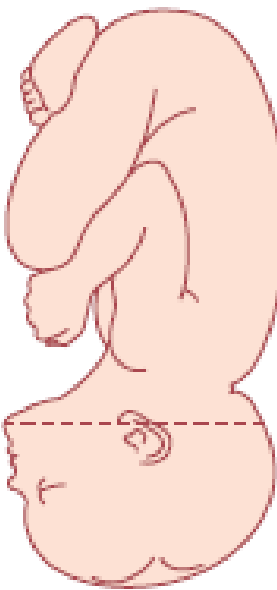
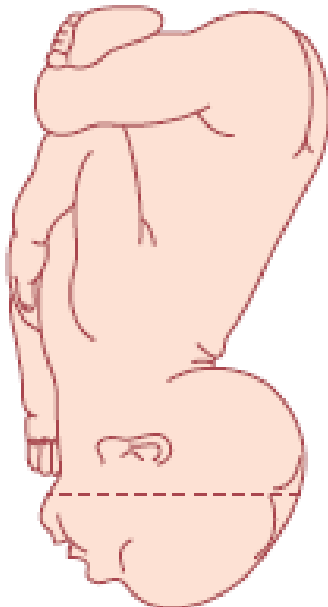


Mentovertical (13.5) cm when the head is extended in brow presentation. It extends from the vertex to the chin.

Flexed

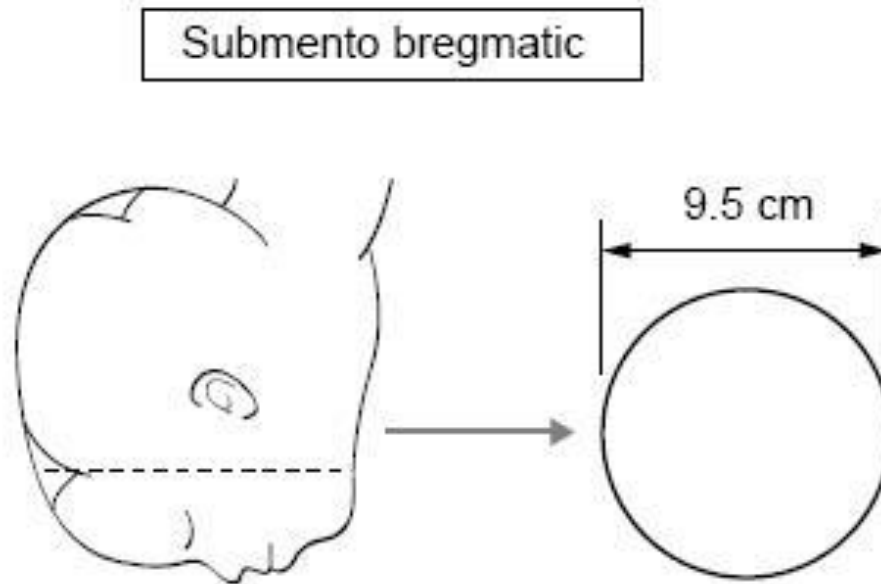


Extended

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
				

e 14.14 The effect of fetal attitude on the presenting diameter

**Submentobregmatic (9.5) cm
when hyper extended head
in the face presentation.it
extends from below the
chin to the bregma.**



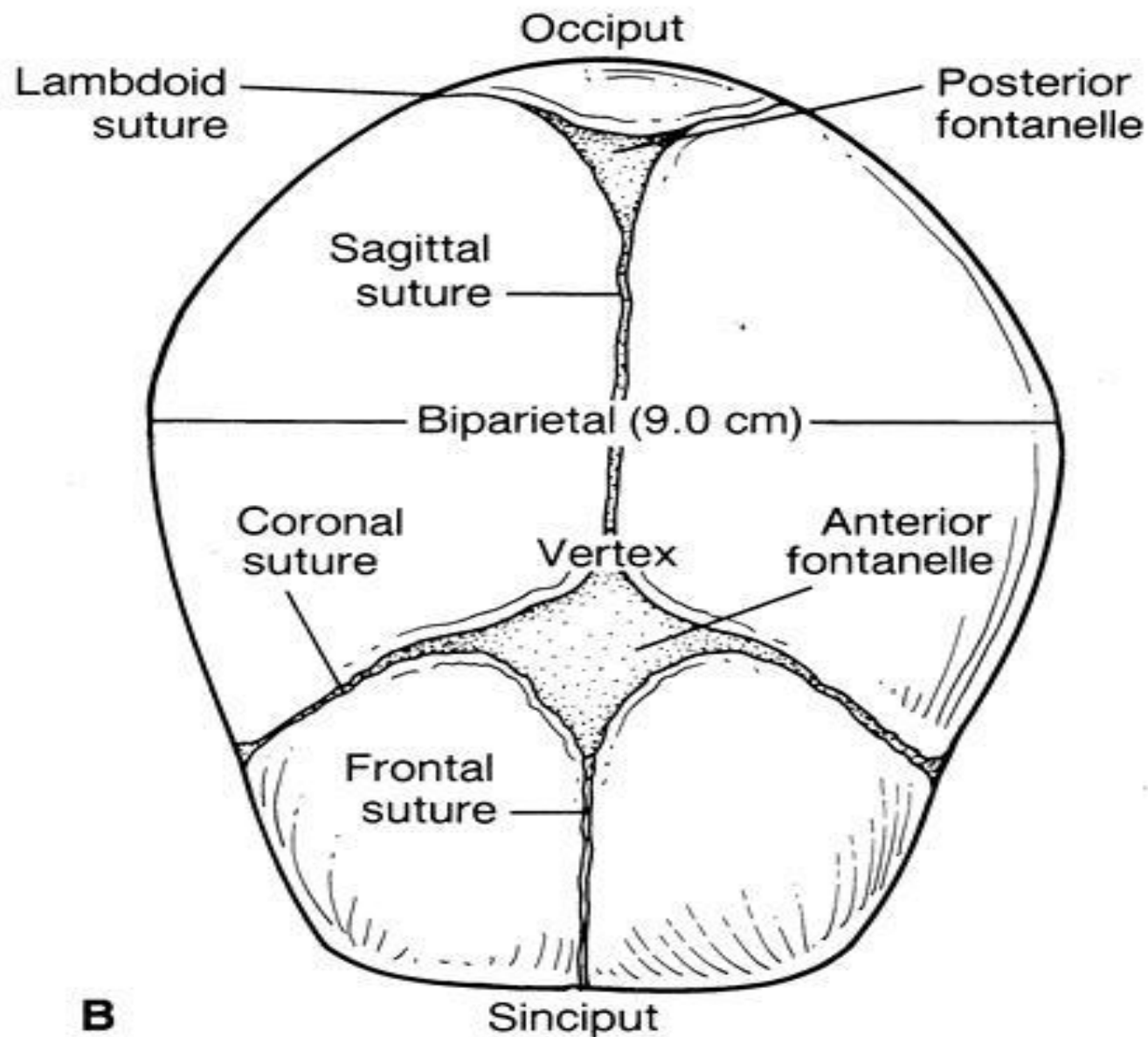


FIG. 2.11. A, B: The bones, sutures, fontanelles, and clinically important diameters of the fetal head.

moulding

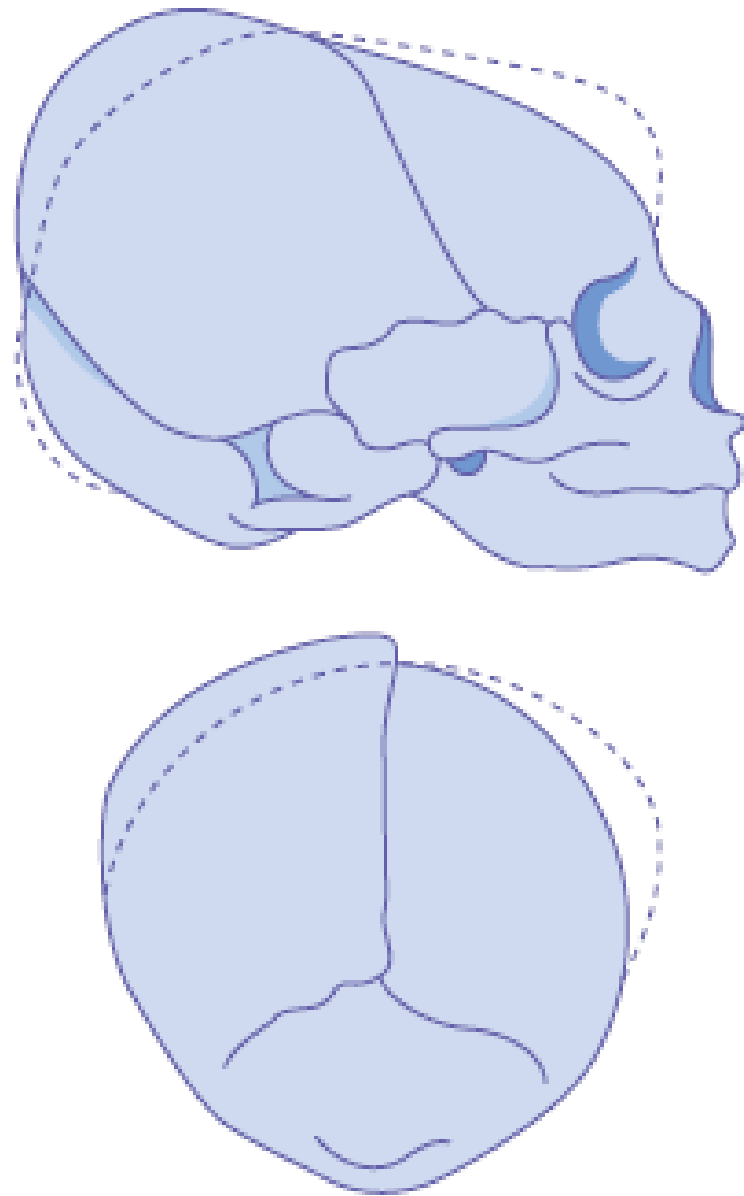


Figure 14.12 A schematic representation of moulding of the fetal skull