Physiology of first stage of labour

Uterine action

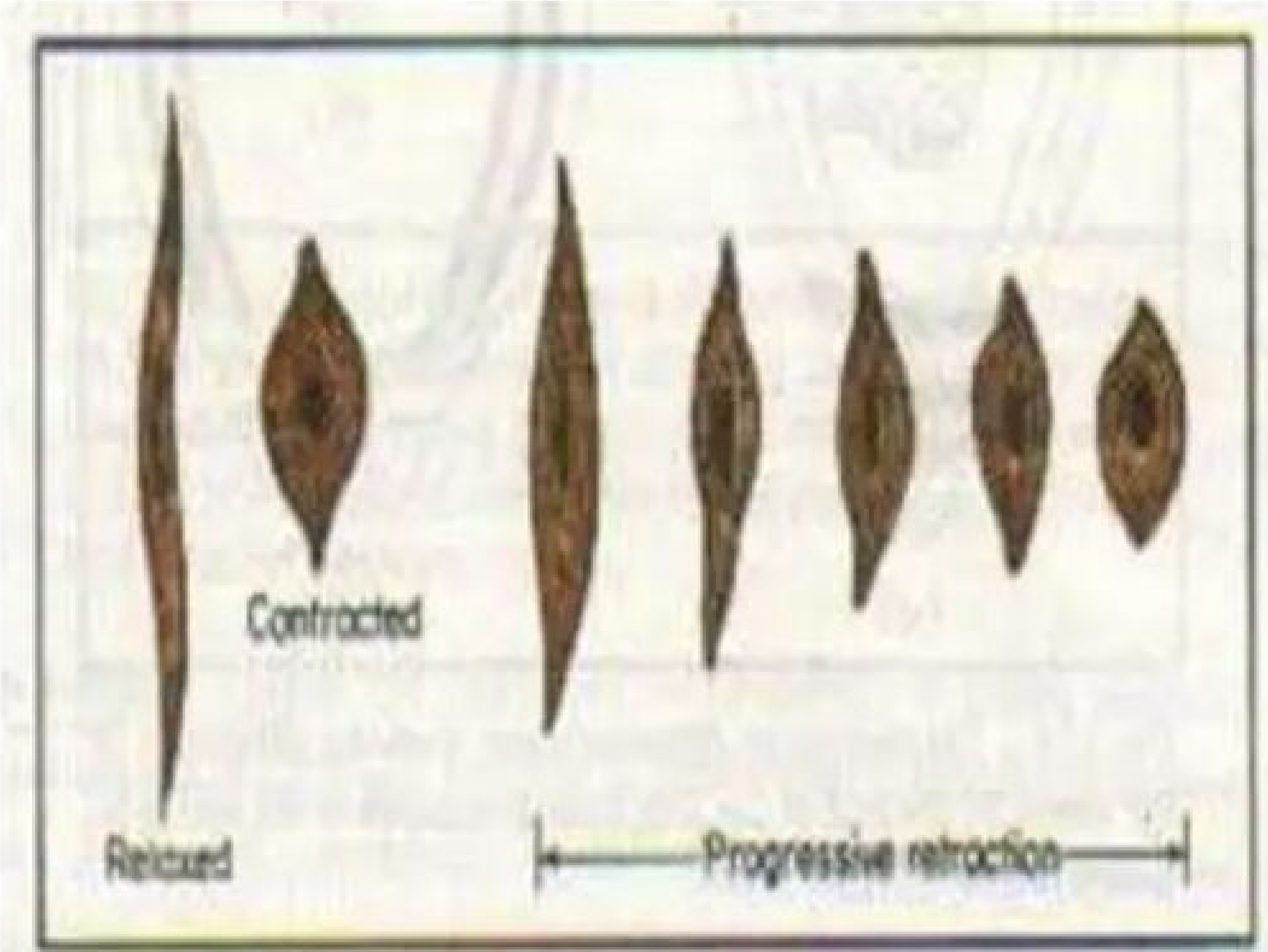
Fundal dominance:

- Each uterine contraction starts in the fundus near one of the cornua and spreads across and downwards.
- The contraction lasts longest in the fundus where it is also most intense, but the peak is reached simultaneously over the whole uterus and the contraction fades from all parts together.

Polarity

- Polarity is the term used to describe the neuromuscular harmony that prevails between the two poles or segments of the uterus throughout labour. During each uterine contraction, these two poles act harmoniously.
- The upper pole contracts strongly and retracts to expel the fetus; the lower pole contracts slightly and dilates to allow expulsion to take place. If polarity is disorganized then the progress of labour is inhibited.

Contraction and retraction



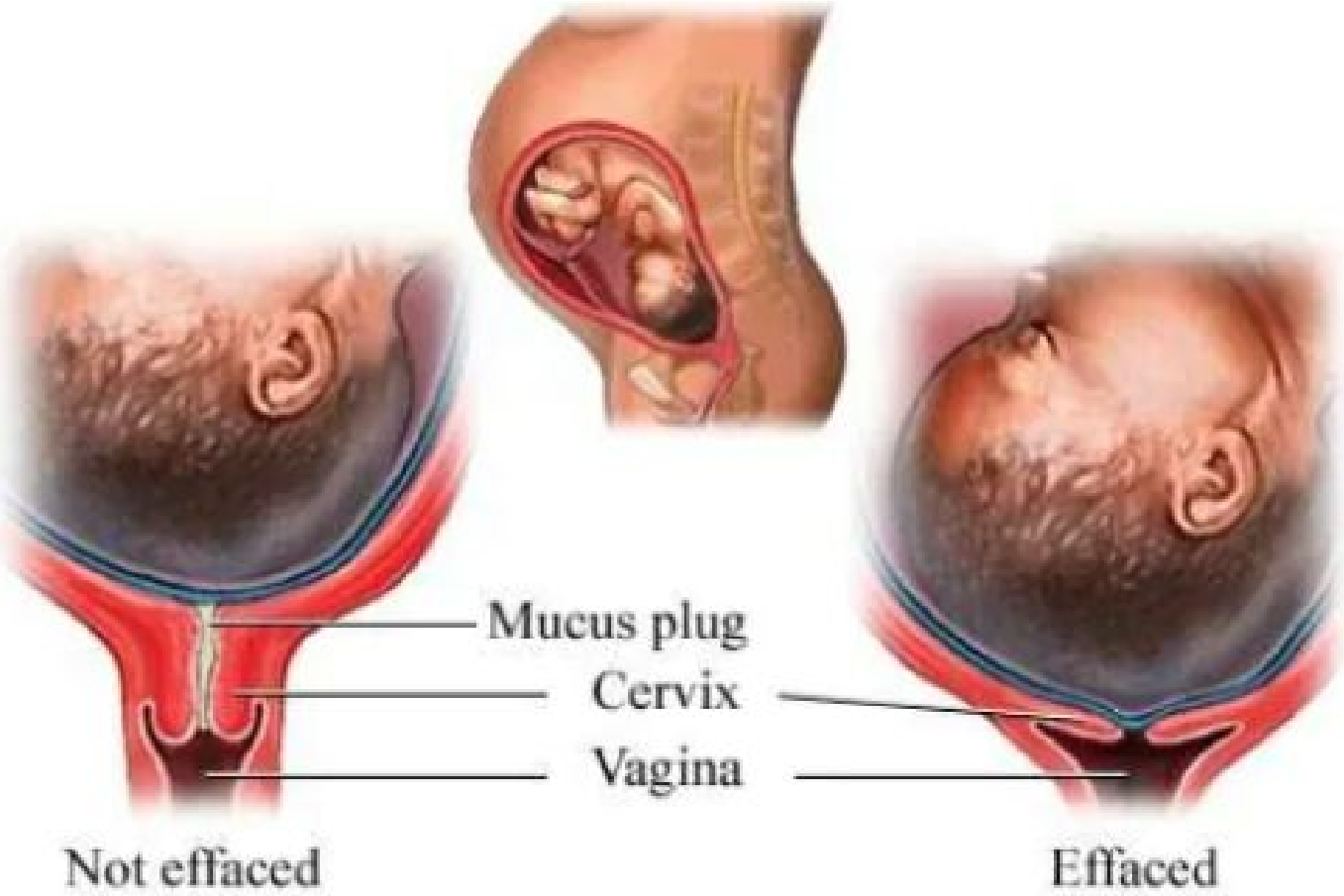
Formation of upper and lower uterine segments

- The upper uterine segment, having been formed from the body of the fundus, is mainly concerned with contraction and retraction; it is thick and muscular.
- The lower uterine segment is formed of the isthmus and the cervix, and is about 8-10 cm in length. The lower segment is prepared for distention and dilatation.
- The muscle content reduces from the fundus to the cervix, where it is thinner.

Cervical effacement

- Effacement refers to the inclusion of the cervical canal into the lower uterine segment.
- It takes place from above downward; that is, the muscle fibres surrounding the internal os are drawn upwards by the retracted upper segment and the cervix merges into the lower uterine segment.
- The cervical canal widens at the level of the internal os, where the condition of the external os remains unchanged.

Cervical effacement cont…



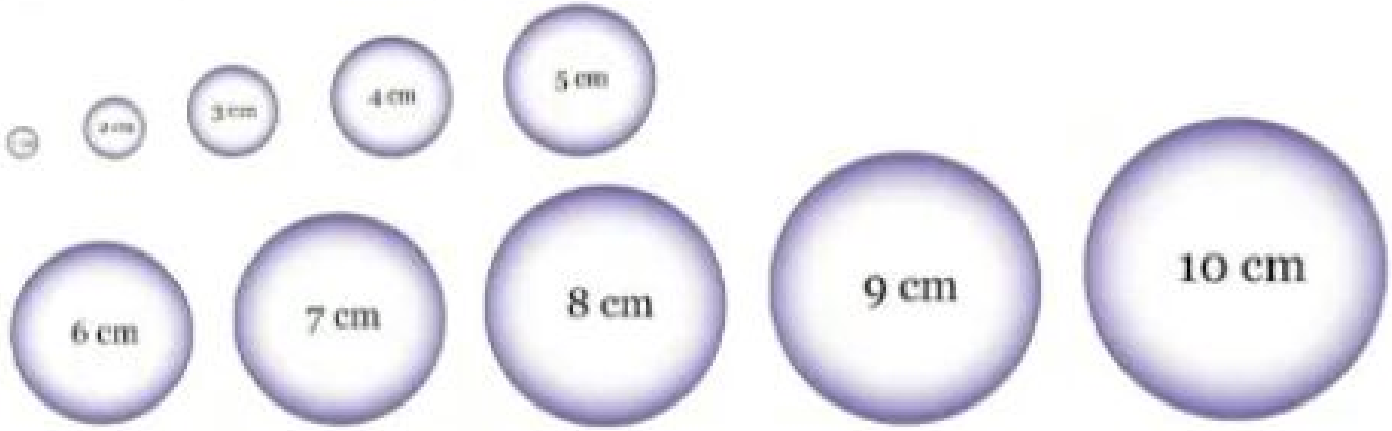
Cervical dilatation

- Dilatation of cervix is the process of enlargement of the os uteri from a tightly closed aperture to an opening large enough to permit the passage of the fetal head. Dilatation is measured in centimeters and full dilatation at term equates to about 10 cm.

Cervical dilatation

A. Cervix is not effaced or dilated. B. Cervix is fully effaced and dilated to 1 cm. C. Cervix is dilated to 5 cm. D. Cervix is fully dilated to 10 cm.

Dilation - the gradual opening of the cervix measured in centimeters from 0 to 10 cms.



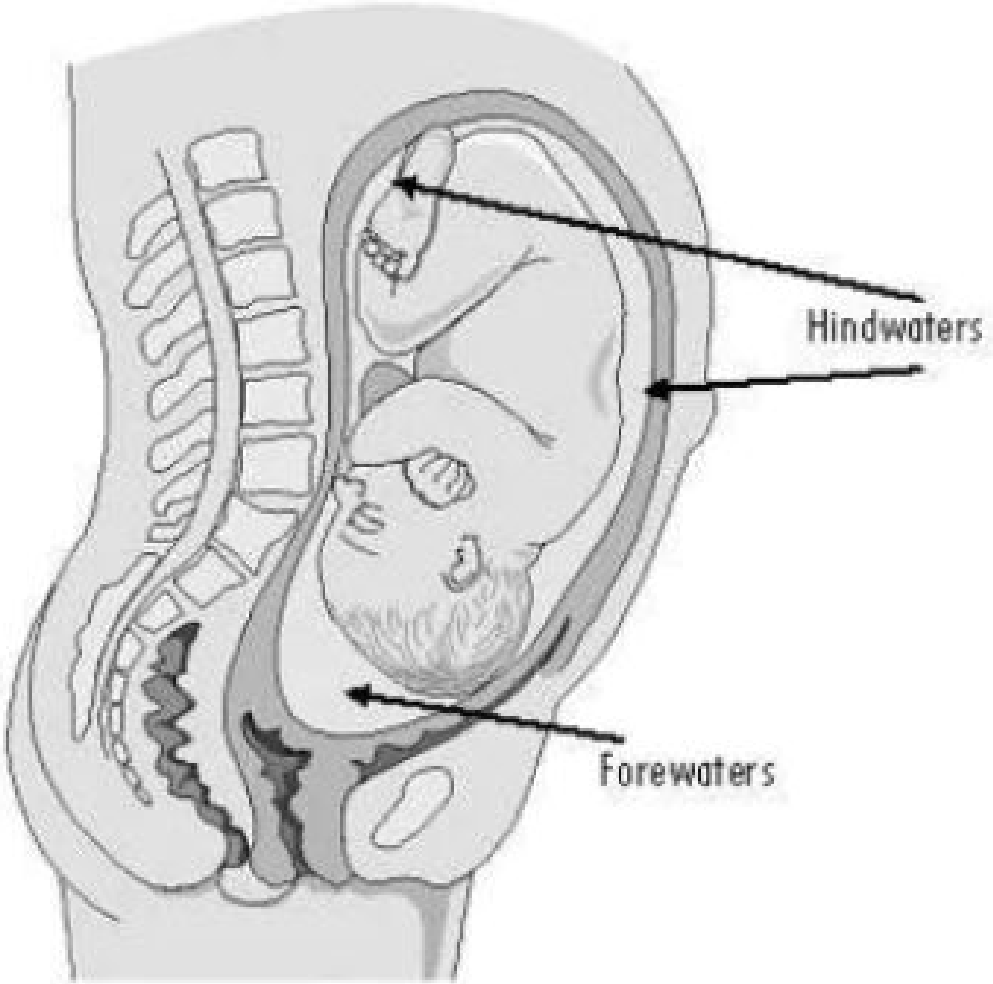
Show

- As a result of the dilatation of the cervix, the operculum, which formed the cervical plug during pregnancy, is lost. The woman may see a blood stained mucoid discharge a few hours before, or within a few hours after, labour starts.
- The blood comes from the ruptured capillaries in the parietal decidua where the chorion has become detached from the dilating cervix.

Formation of fore water

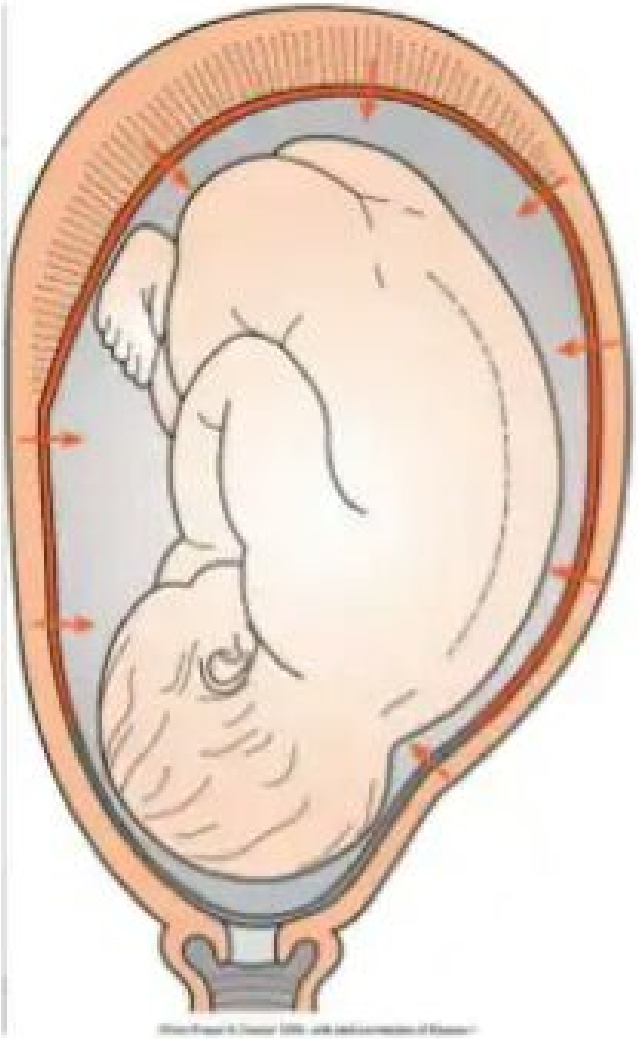
- As the lower uterine segment forms and stretches, the chorion becomes detached from it and the increased intrauterine pressure causes its loosened part of the sac of fluid to bulge downwards into the internal os, to the depth of 6-12 mm.
- The well flexes head fits snugly into the cervix and cuts off the fluid in front of the head from that which surrounds the body.
- The former is known as 'forewaters' and the latter the 'hindwaters'.

Formation of forewater



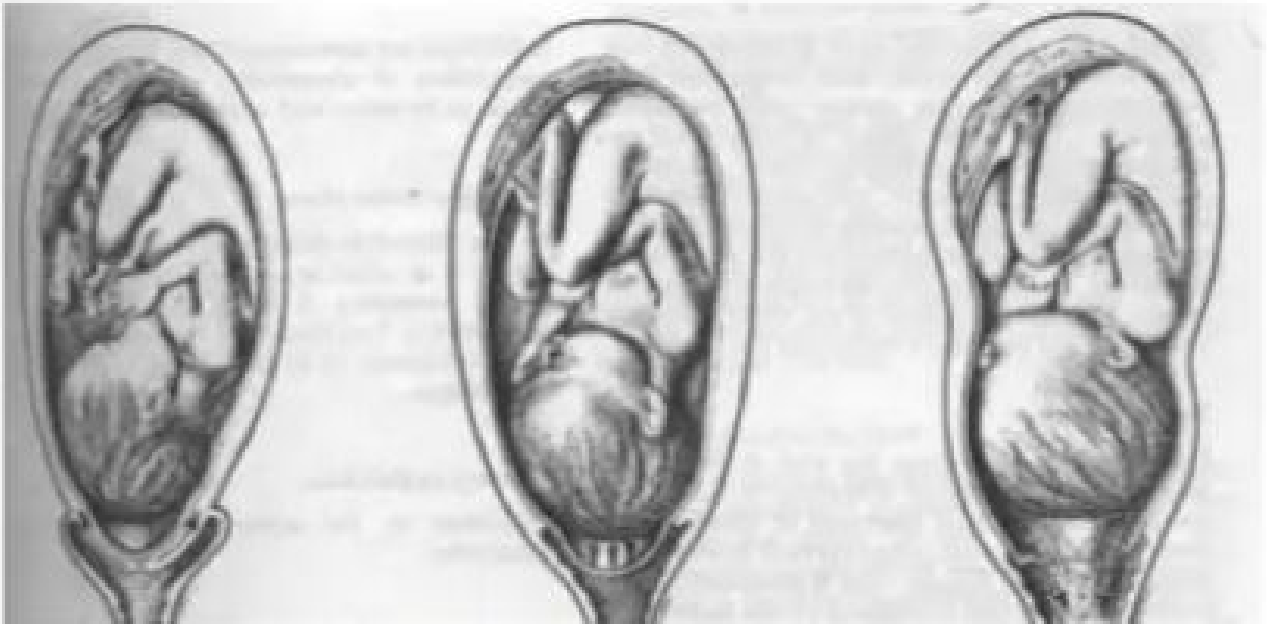
General Fluid Pressure

- While the membranes remain intact, the pressure of the uterine contractions is exerted on the fluid and, as fluid is not compressible, the pressure is equalized throughout the uterus and the fetal body; it is known as 'general fluid pressure'.



Rupture of membrane

- The optimal physiological time for the membranes to rupture spontaneously is at the end of the first stage of labour after the cervix becomes fully dilated and no longer supports the bag of forewaters.



Fetal Axis Pressure

- During each contraction the uterus rises forward and the force of the fundal contraction is transmitted to the upper pole of the fetus down the long axis of the fetus and applied by the presenting part to the cervix. This is known as fetal axis pressure.