

## **MECHANISM OF LABOR**

**Labor is a physiologic process during which the products of conception (ie, the fetus, membranes, umbilical cord, and placenta) are expelled outside of the uterus. Labor is achieved with changes in the biochemical connective tissue and with gradual effacement and dilatation of the uterine cervix as a result of rhythmic uterine contractions of sufficient frequency, intensity, and duration. Labor is a clinical diagnosis. The onset of labor is defined as regular, painful uterine contractions resulting in progressive cervical effacement and dilatation. There is an interplay between the powers of the uterus, the passages of the birth canal and the passenger, single or multiple.**

**Labor begins with uterine contractions become painful and progressive, more than one in ten minutes, with or without a show ( is the release from the cervix of a blood stained mucus plug, which is then expelled from the vagina) or rupture of the membranes leading to progressive changes in the cervix.**

**The majority of women experience normal labor and normal delivery. We need good preparation, support, careful assessment and midwifery skill. The labor is recorded on a partogram.**

**Stages of labor: Obstetricians have divided labor into 3 stages**

**First stage of labor-** The first stage begins with regular uterine contractions and ends with complete cervical dilatation at approximately 10 cm. The first stage is subdivided into an early latent phase and an active phase. The latent phase describes the period between the onset of labor and when the cervix is 3 cm dilated. The active phase occurs from 3 cm to full dilatation and the rate of cervical dilatation occurs normally at 1 cm/ hour in a primi and 2 cm/ hour in a multi. The active phase is further divided into an acceleration phase, a phase of maximum slope, and a deceleration phase. Characteristics of the average cervical dilatation curve are known as the Friedman curve, and a series of definitions of labor protraction and arrest were subsequently established.

**Second stage of labor-** The second stage begins with complete cervical dilatation and ends with the delivery of the fetus. The ACOG has suggested that a prolonged second stage of labor should be considered when the second stage exceeds 3 hours if regional anesthesia is administered or 2 hours in the absence of regional anesthesia in nulliparas. In multiparous women, such a diagnosis can be made if the second stage of labor exceeds 2 hours with regional anesthesia or 1 hour without it.

**It is subdivided into two phases: phase one is when there is no maternal urge to push, fetal head is high and the sagittal suture in the transverse position.**

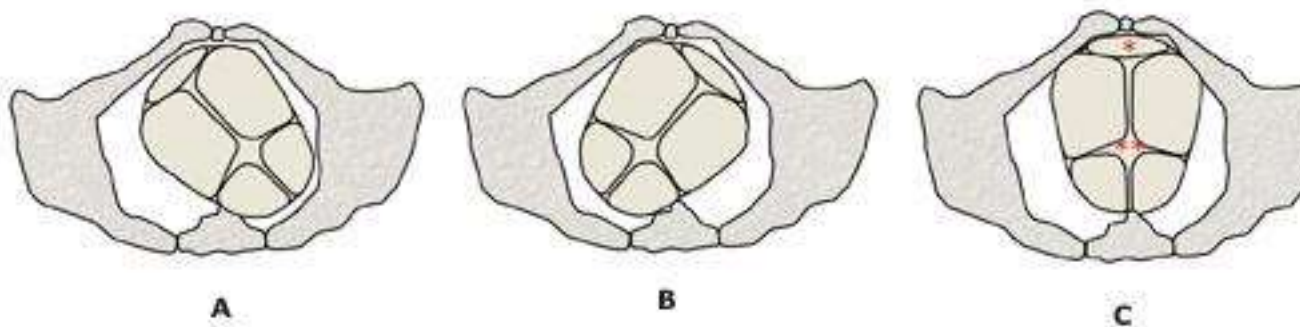
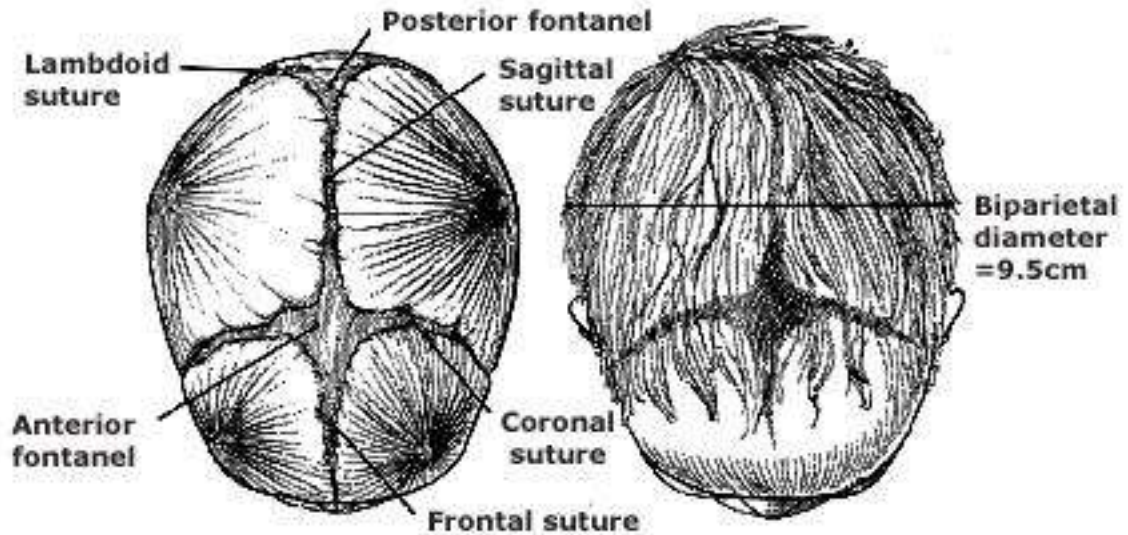
**Phase two there is maternal urge to push, head is low and the sagittal suture is in the anterior- posterior position.**

**Studies performed to examine perinatal outcomes associated with a prolonged second stage of labor revealed increased risks of surgical deliveries and maternal morbidities but no differences in neonatal outcomes Maternal risk factors associated with a prolonged second stage include nulliparity, maternal weight and/or weight gain, use of regional anesthesia, induction of labor, fetal occiput in a posterior position, and increased birth weight.**

**Third stage of labor-** The third stage of labor lasts from the delivery of the fetus until the delivery of the placenta and fetal membranes. Although delivery of the placenta requires less than 10 minutes, the duration of the third stage of

labor may last as long as 30 minutes before active intervention is commonly considered.

Duration of labor- it is 8-12 hours in primi and 4-8 hours in multi. The moral of most women start to deteriorate after six hours.



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This refers to the changes in position and attitude that the fetus undergoes during its passage through the birth canal. It is also known as the cardinal movements, it is described here for the vertex presentation (as is the case in 95% of all pregnancies) and the gynecoid pelvis.

**Engagement-** The widest diameter of the presenting part (with a well-flexed head, where the largest transverse diameter of the fetal occiput is the biparietal diameter) enters the maternal pelvis to a level below the plane of the pelvic inlet. On the pelvic examination, the presenting part is at 0 stations, or at the level of the maternal ischial spines. And two fifth of the fetal head is only palpable. Engagement occurs prior to labor in the majority of nulliparous women.

**Descent-** The downward passage of the presenting part through the pelvis. This occurs intermittently with contractions. The rate is greatest during the second stage of labor. It is helped by voluntary use of abdominal musculature.

**Flexion-** As the fetal vertex descends, it encounters resistance from the bony pelvis or the soft tissues of the pelvic floor, resulting in passive flexion of the fetal occiput. The chin is brought into contact with the fetal thorax and the presenting diameter changes from occipitofrontal (11.0 cm) to suboccipitobregmatic (9.5 cm) for optimal passage through the pelvis.

**Internal rotation-** As the head descends, the presenting part, usually in the transverse position, is rotated about  $45^\circ$  to anteroposterior (AP) position under the symphysis. Internal rotation brings the AP diameter of the head in line with the AP diameter of the pelvic outlet. The internal rotation occurs because with a well flexed head the occiput is the leading and meets the sloping gutter of the levator ani muscles, which by their shape direct it anteriorly.









**Extension-** With further descent and full flexion of the head, the base of the occiput comes in contact with the inferior margin of the pubic symphysis. Upward resistance from the pelvic floor and the downward forces from the uterine contractions cause the occiput to extend and rotate around the symphysis and starting to distend the vulva. This is known as crowning of the head. This is followed by the delivery of the fetus' head. The delivery of the bregma, face, and the chin appear in succession over the posterior vaginal opening and perineal body.



**Restitution-** When the fetus' head is free of resistance, it untwists about  $45^\circ$  left or right, returning to its original anatomic position in relation to the body. It aligns itself with the shoulders which have entered the pelvis in oblique position. The rotation of the occiput through one eighth of the circle is called restitution.

**External rotation-** In order to be delivered the shoulders has to rotate into direct AP plane, when this occurs the occiput rotates through a further one eighth of a circle to the transverse position.

**Shoulder rotation-**After the fetus' head is delivered, further descent brings the anterior shoulder to the level of the pubic symphysis. The anterior shoulder is then rotated under the symphysis, followed by the posterior shoulder.

**Delivery of the fetal body-**The rest of the fetal body delivers aided by lateral; movements.

		<p><b><u>Descent:</u></b> As the fetal head engages and descends, it assumes an occiput transverse position because that is the widest pelvic diameter available for the widest part of the fetal head.</p>
		<p><b><u>Flexion:</u></b> While descending through the pelvis, the fetal head flexes so that the fetal chin is touching the fetal chest. This functionally creates a smaller structure to pass through the maternal pelvis. When flexion occurs, the occipital (posterior) fontanel slides into the center of the birth canal and the anterior fontanel becomes more remote and difficult to feel. The fetal position remains occiput transverse.</p>
		<p><b><u>Internal Rotation:</u></b> With further descent, the occiput rotates anteriorly and the fetal head assumes an oblique orientation. In some cases, the head may rotate completely to the occiput anterior position.</p>
		<p><b><u>Extension:</u></b> The curve of the hollow of the sacrum favors extension of the fetal head as further descent occurs. This means that the fetal chin</p>

		is no longer touching the fetal chest.
		<p><b>External Rotation:</b> The shoulders rotate into an oblique or frankly anterior-posterior orientation with further descent. This encourages the fetal head to return to its transverse position. This is also known as restitution.</p>

