PARTURITION

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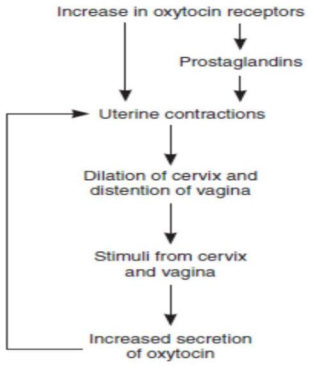
Labor or ***parturition*** is the process by which the fetus is expelled from the uterus through the vagina. Its onset is determined by complex interactions of several placental and fetal hormones. As progesterone inhibits contractions of uterus, labor cannot occur until diminishing of the effects of progesterone. Toward the end of pregnancy, the levels of oestrogens in mother's blood rise sharply to overcome the inhibitory effects of progesterone. This rise in oestrogens results from increasing secretion by the placenta of **corticotropin-releasing hormone**, which stimulates the anterior pituitary gland of the foetus to secrete ACTH (adrenocorticotropic hormone).

ACTH stimulates the fetal adrenal gland to secrete **cortisol** and **dehydroepiandrosterone** (DHEA). The placenta then converts DHEA into an estrogen. High levels of oestrogens cause the number of receptors for oxytocin on uterine muscle fibres to increase, and cause uterine muscle fibres to form gap junctions with one another.

Oxytocin from the posterior pituitary stimulates uterine contractions, and **relaxin** from the placenta assists by increasing the flexibility of the pubic symphysis and helping dilate the uterine cervix. Estrogen also stimulates the placenta to release prostaglandins, which induce production of enzymes that digest collagen fibres in the cervix, causing it to soften.



Contractions of the uterine myometrium force the baby's head or body into the cervix. Stretch receptors in the cervix send nerve impulses to neurosecretory cells in the hypothalamus, causing them to release oxytocin into blood capillaries of the posterior pituitary gland. Oxytocin then is carried by the blood to the uterus to stimulate the myometrium to contract more forcefully. As the contractions intensify, the baby's body stretches the cervix still more, and the resulting nerve impulses stimulate the secretion of yet more oxytocin. With birth of the infant, the positive feedback cycle is broken because cervical distension suddenly lessens.

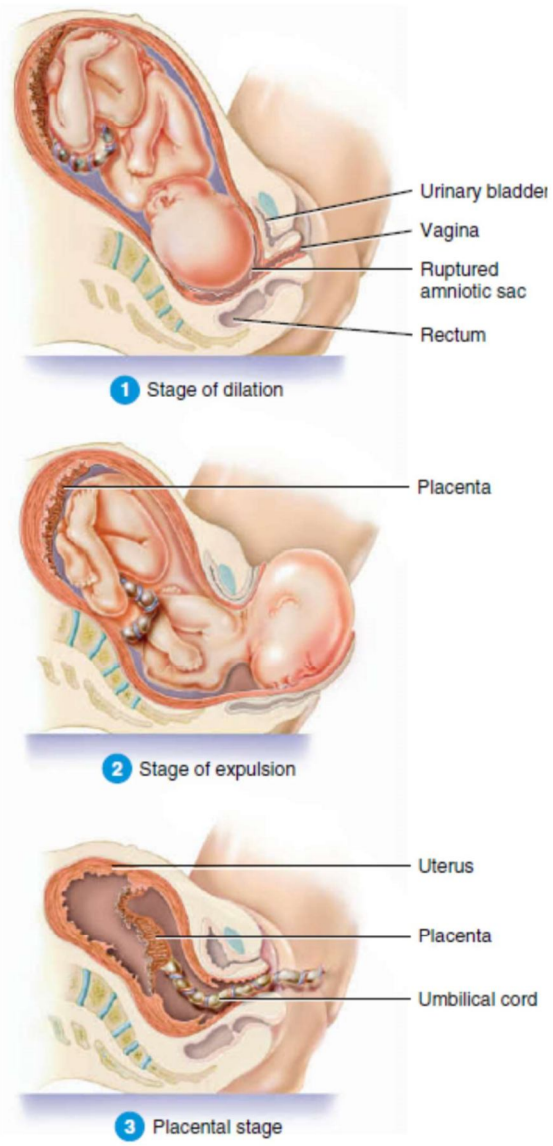
Uterine contractions occur in waves that start at the top of the uterus and move downward, eventually expelling the foetus.

True labour begins when uterine contractions occur at regular intervals, usually producing pain. As the interval between contractions shortens, the contractions intensify. Another symptom of true labour in some women is localization of pain in the back that is intensified by walking. The most reliable indicator of true labour is dilation of the cervix and the "show," a discharge of a blood-containing mucus into the cervical canal.

In **false labor**, pain is felt in the abdomen at irregular intervals, but it does not intensify and walking does not alter it significantly. There is no "show" and no cervical dilation.

True labor can be divided into **three** stages:

1. *Stage of dilation.* Time from the onset of labour to the complete dilation of the cervix is the **stage of dilation**. This stage typically lasts for 6–12 hours. It has regular contractions of the uterus, usually a rupturing of the amniotic sac, and complete dilation (to 10 cm) of the cervix. If the amniotic sac does not rupture spontaneously, it is ruptured intentionally.
2. *Stage of expulsion.* It expands from complete cervical dilation to delivery of the baby. It lasts for 10 minutes to several hours.
3. *Placental stage.* The time (5–30 minutes or more) after delivery until the placenta or "afterbirth" is expelled by powerful uterine contractions is the **placental stage**. These contractions also constrict blood vessels that were torn during delivery, reducing the likelihood of hemorrhage.



As a rule, labour lasts longer with first babies, typically about 14 hours. For women who have previously given birth, the average duration of labour is about 8 hours—although the time varies enormously among births.

Following the delivery of the baby and placenta is a 6-week period during which the maternal reproductive organs and physiology return to the prepregnancy state. This period is called the **puerperium**. Through a process of tissue catabolism, the uterus undergoes a remarkable reduction in size, called **involution**, especially in lactating women. The cervix loses its elasticity and regains its prepregnancy firmness. For 2–4 weeks after delivery, women have a uterine discharge called **lochia**, which consists initially of blood and later of serous fluid derived from the former site of the placenta.

Control of labour

Contractions during parturition occurs via a positive feedback cycle. The first contractions of labour (stimulus) push part of the foetus into the cervix, the lowest part of the uterus, which opens into the vagina. Stretch-sensitive nerve cells (receptors) monitor the amount of stretching of the cervix (controlled condition). As stretching increases, they send more nerve impulses to the brain, which in turn releases the hormone oxytocin into the blood. Oxytocin causes muscles in the wall of the uterus (effector) to contract even more forcefully. The contractions push the foetus farther down the uterus, which stretches the cervix even more. The cycle of stretching, hormone release, and ever-stronger contractions is interrupted only by the birth of the baby. Then, stretching of the cervix ceases and oxytocin is no longer released.