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Phs 204 Assignment

May 9, 2020

I expect more on the physiology of lactations and details on the physiology of pregnancy in a normal woman.

**Lactation**, secretion and yielding of [milk](https://www.britannica.com/topic/milk) by females after giving birth. The milk is produced by the [mammary glands](https://www.britannica.com/science/mammary-gland), which are contained within the breasts. The breasts, unlike most of the other [organs](https://www.britannica.com/science/organ-biology), continue to increase in size after [childbirth](https://www.britannica.com/science/birth). Although mammary growth begins during [pregnancy](https://www.britannica.com/science/pregnancy) under the influence of ovarian and placental [hormones](https://www.britannica.com/science/hormone), and some milk is formed with copious milk secretion sets in only after delivery. Since lactation ensues after a [premature birth](https://www.britannica.com/science/premature-birth), it would appear that milk production is held back during pregnancy. The mechanism by which this inhibitory effect is brought about, or by which lactation is initiated at delivery, has long been the subject of an argument that revolves around the opposing actions of [estrogen](https://www.britannica.com/science/estrogen), [progesterone](https://www.britannica.com/science/progesterone), and [prolactin](https://www.britannica.com/science/prolactin), as studied in laboratory animals, goats, and cattle. During [pregnancy](https://www.britannica.com/science/pregnancy) the combination of [estrogen](https://www.britannica.com/science/estrogen) and progesterone circulating in the [blood](https://www.britannica.com/science/blood-biochemistry) appears to inhibit milk secretion by blocking the release of [prolactin](https://www.britannica.com/science/prolactin) from the [pituitary gland](https://www.britannica.com/science/pituitary-gland) and by making the [mammary gland](https://www.britannica.com/science/mammary-gland) cells unresponsive to this pituitary hormone.

The blockade is removed at the end of pregnancy by the expulsion of the [placenta](https://www.britannica.com/science/placenta-human-and-animal) and the loss of its supply of hormones, as well as by the decline in hormone production by the [ovaries](https://www.britannica.com/science/ovary-animal-and-human), while sufficient estrogen remains in circulation to promote the secretion of prolactin by the pituitary gland and so favour lactation. For lactation to continue, necessary patterns of [hormone](https://www.britannica.com/science/growth-hormone) secretion must be maintained; disturbances of the equilibrium by the experimental removal of the pituitary gland in animals or by comparable diseased conditions in humans quickly arrest milk production. Several pituitary hormones seem to be involved in the formation of milk, so that it is customary to speak of a lactogenic (“milk-producing”) complex of hormones. To some degree, the role of the pituitary hormones [adrenocorticotropin](https://www.britannica.com/science/adrenocorticotropic-hormone), [thyrotropin](https://www.britannica.com/science/thyrotropin), and [growth hormone](https://www.britannica.com/science/growth-hormone) in supporting lactation in women is inferred from the results of studies done on animals and from clinical observations that are in agreement with the results of animal studies. [Adrenal corticoids](https://www.britannica.com/science/adrenal-hormone) also appear to play an essential role in maintaining lactation.

The stimulus of nursing or [suckling](https://www.britannica.com/science/suckling) supports continued lactation. It acts in two ways: it promotes the secretion of prolactin (and possibly other pituitary hormones of value in milk formation), and it triggers the release of yet another hormone from the pituitary gland—[oxytocin](https://www.britannica.com/science/oxytocin), which causes the contraction of special [muscle](https://www.britannica.com/science/muscle) cells around the alveoli in the breast and ensures the expulsion of milk. It is in this way that a baby’s sucking at one breast may cause an increase in milk flow from both, so that milk may drip from the unsuckled nipple. About 30 seconds elapse between the beginning of active suckling and the initiation of milk flow.

The nerve supply to the mammary glands is not of great significance in lactation, for milk production is normal after the experimental severing of nerves to the normal mammary glands in animals or in an udder transplanted to the neck of a goat. Milk ejection, or “the draught,” in women is readily conditioned and can be precipitated by the preparations for nursing. Conversely, embarrassment or fright can inhibit milk ejection by interfering with the release of oxytocin; alcohol, also, is known to block milk ejection in women, again by an action on the [brain](https://www.britannica.com/science/brain). Beyond its action on the mammary glands, oxytocin affects uterine muscle, so that suckling can cause contractions of the [uterus](https://www.britannica.com/science/uterus) and may sometimes result in cramp. Since oxytocin release occurs during [sexual intercourse](https://www.britannica.com/science/sexual-intercourse), milk ejection in lactating women has been observed on such occasions. Disturbance of oxytocin secretion, or of the milk-ejection reflex, stops lactation just as readily as a lack of the hormones necessary for milk production, for the milk in the breast is then not extractable by the infant. Many instances of nursing failure are due to a lack of milk ejection in stressful circumstances; fortunately, treatment with oxytocin, coupled with the reassurance gained from a successful nursing, is ordinarily successful in overcoming the difficulty.

Suckling can initiate lactation in non-pregnant women. This has been seen most often in women of childbearing age but also has been observed in older persons. A baby who had lost his mother was suckled by his 60-year-old grandmother, who had borne her last child 18 years before. The grandmother produced milk after a few days and continued to nurse the baby until he was a year old and could walk. Rarely, lactation has been reported to set in after operations on the chest; in such instances it is attributed to injury or irritation of the nerves in this region. Such observations argue against the possibility that lactation continues simply as a consequence of emptying the breasts.