

Presentation on lactation and its hormonal regulation



LACTATION

MEANING: Production of milk in the mammary glands.

PERIOD: The female mammary glands undergo differentiation during pregnancy and start producing milk towards the end of pregnancy and after the birth of the young one.

MAMMARY GLANDS

It is modified sweat gland

These are situated in the front of the thorax on pectoral muscles.

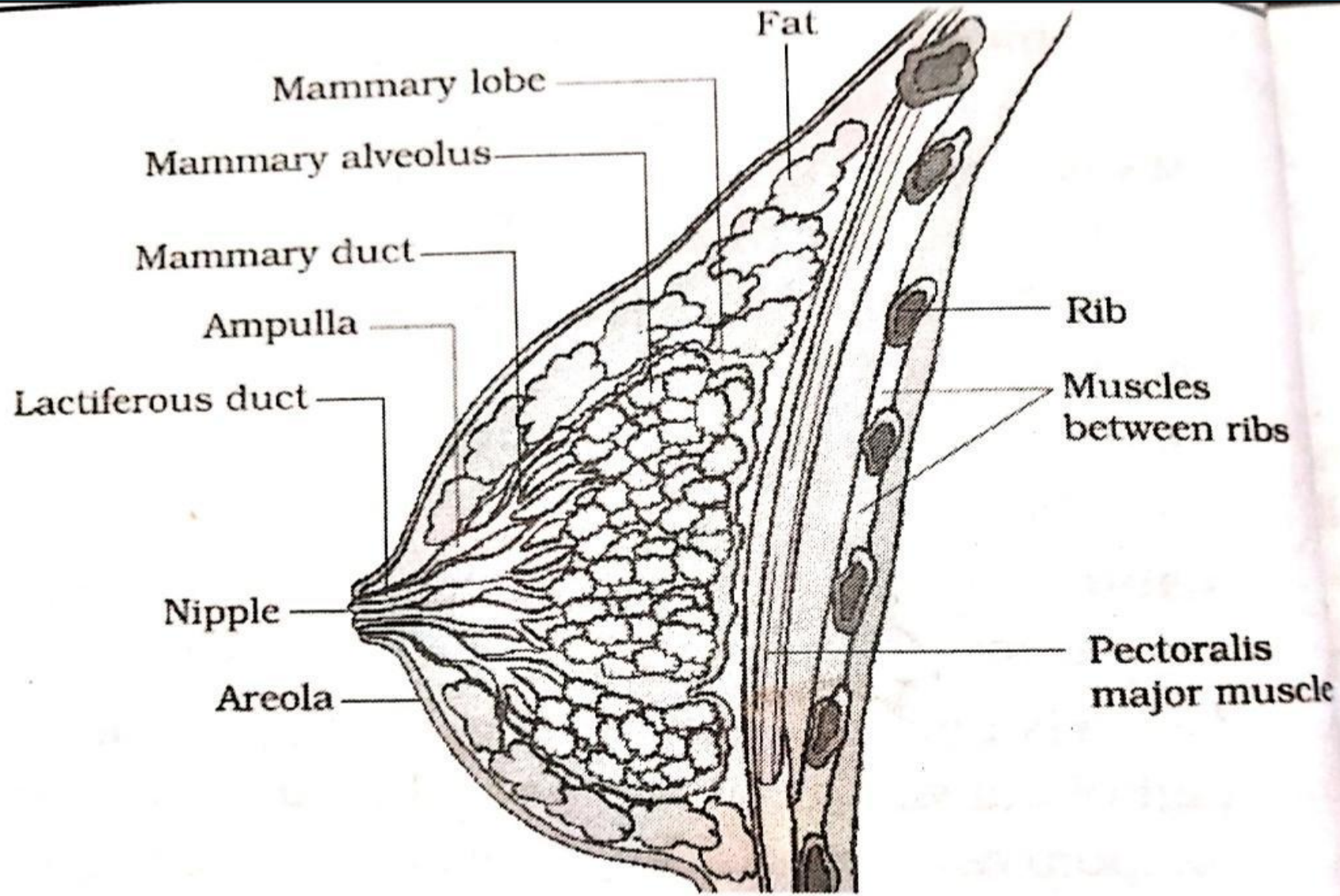
Each mammary gland has 15-20 tubulo-alveolar lobules contained in its connective tissue.

The space b/w the lobules is filled with fatty tissue.

The lobules contain milk glands in the form of bunches of grapes, which secrete milk.

Numerous small ductules arise from each lobule, combine to form a lactiferous duct. Such lactiferous ducts open independently in the nipple.

A nipple is a pigmented structure which is an elevated knob like structure at the apical part of mammary glands. The area adjacent to the nipples is also deeply pigmented, which is known as areola mammae.



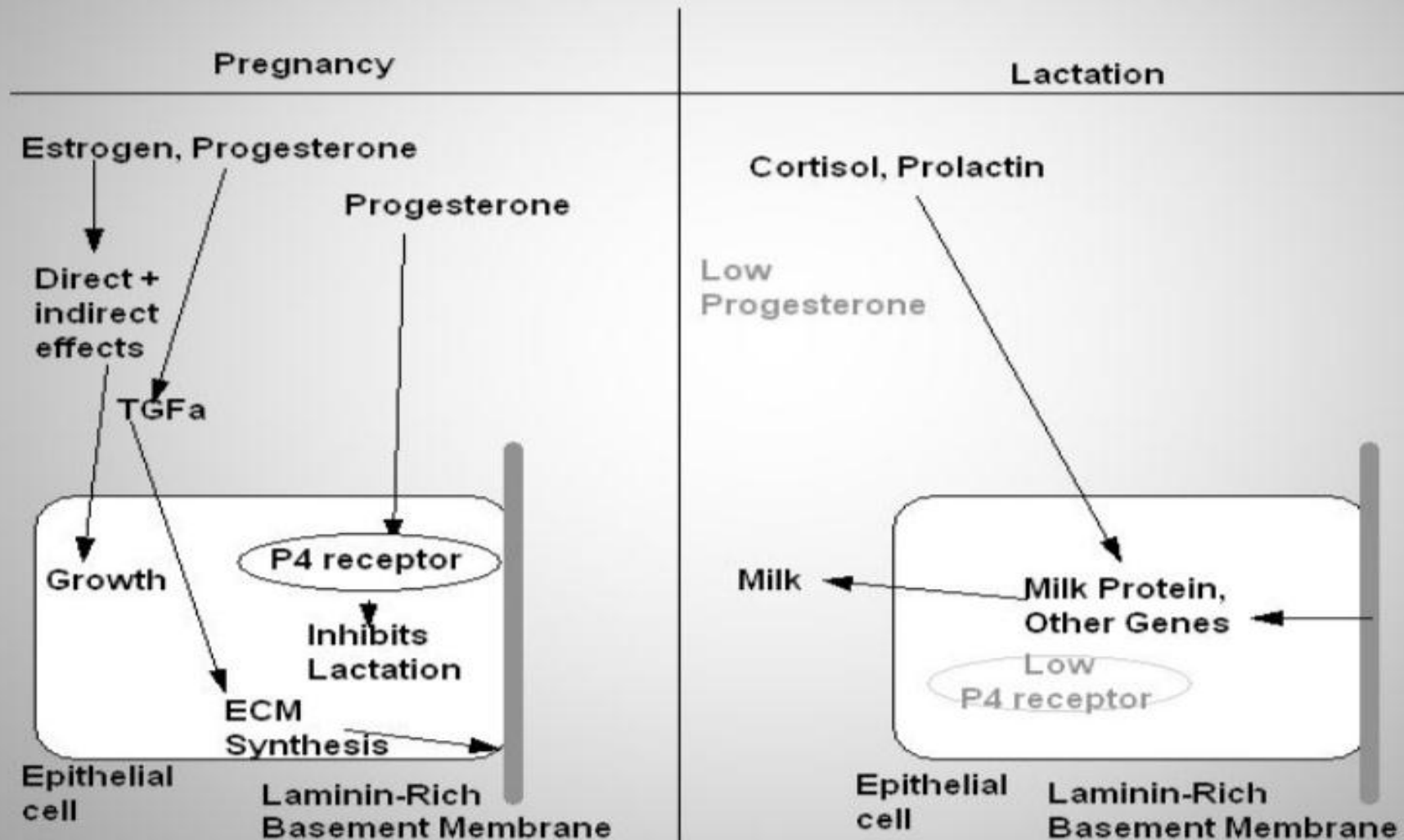
A diagrammatic sectional view of Mammary gland

Composition of Milk: Human milk consists of water and organic and inorganic substances.

Its main constituents are fat (fat droplets), Casein (milk protein), Lactose (milk sugar), mineral salts (sodium, calcium, potassium, phosphorous, etc.) and vitamins. Milk is poor in iron content. Vitamin C is present in very small quantity in milk.

A nursing woman secretes 1 to 2 litres of milk per day.

Model of Lactogenesis



Hormonal Regulation of lactation

Milk production is stimulated largely by the hormone prolactin secreted by anterior lobe and the ejection of milk is stimulated by the hormone oxytocin, released from posterior lobe of the pituitary gland.

During pregnancy, pituitary prolactin may be substituted by placental lactogen.

Milk synthesis begins in the 2nd half of pregnancy. It is supported by prolactin and cortisol, which directly act on enzyme activities and processes of differentiation of the alveolar cells.

The sudden surge in the secretion of milk after parturition is most likely due to the rapid decline of the serum levels of progesterone.

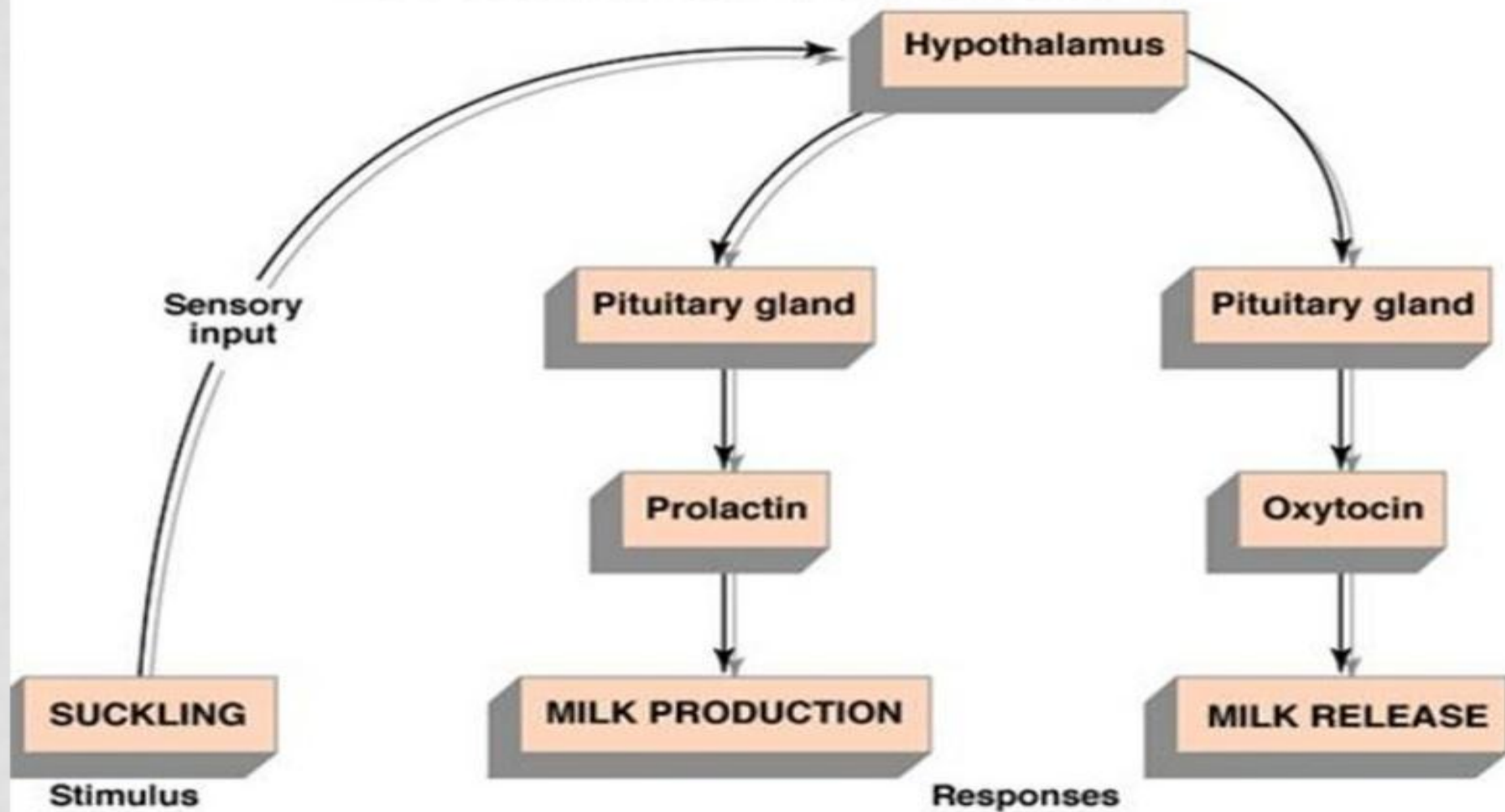
The ejection of milk from the lactating mammary gland is controlled by a neuroendocrine reflex mechanism.

Suckling is the appropriate stimulus for the release of oxytocin from the posterior pituitary.

Oxytocin increases intramammary pressure by including contraction of the myoepithelial cells and thus aids in expelling the milk from the mammary glands.

Suckling does not only stimulate the release of oxytocin, but also provokes secretion of prolactin and ACTH.

Control of Lactation



This increase in prolactin caused by suckling guarantees galactopoiesis.

The experimental ergot derivative 2-Bromo- α -l-phenylethylamino-ergocryptine is a potent suppressor of prolactin secretion from the anterior pituitary.

This drug is not effective in suppressing the onset of lactation, but also in inhibiting lactation once milk secretion had started.

Inhibitory peptide : Milk contains an inhibitory peptide . If the mammary glands are not fully emptied accumulates and inhibit milk production.