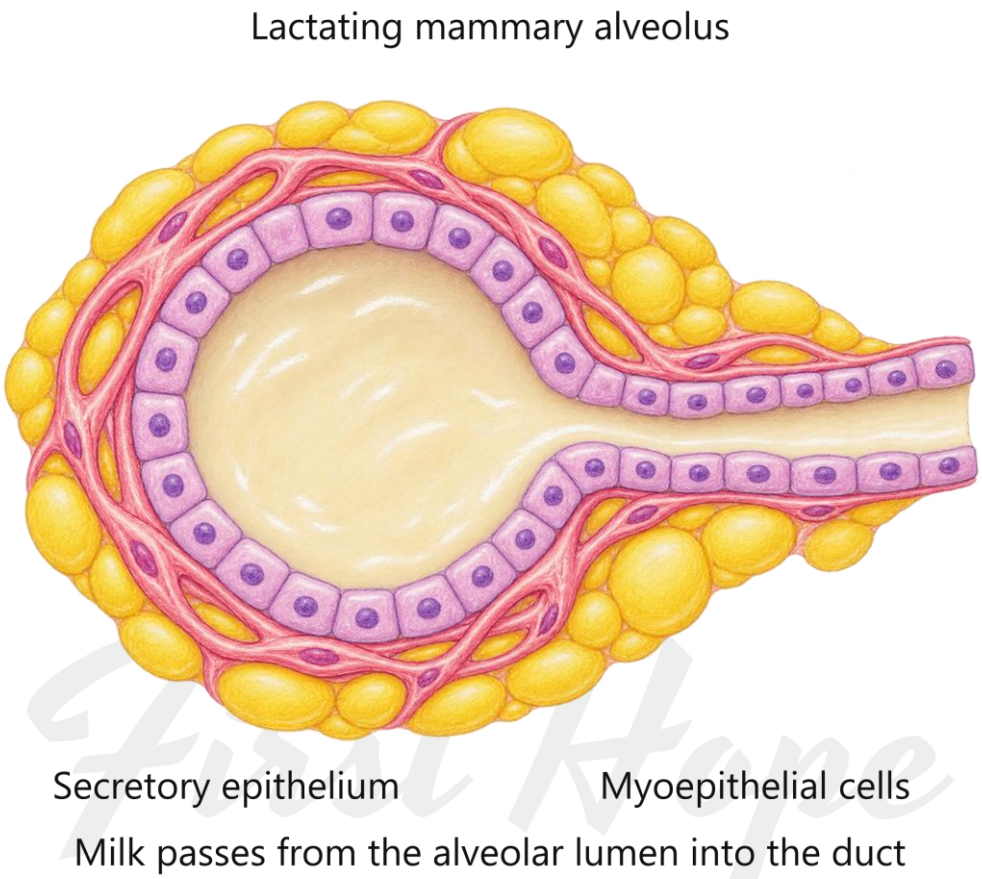
Obstetrics & Gynaecology - Topic 17 - Lactation

Physiology of Lactation

How Milk Is Produced and Released



Milk is produced by alveolar epithelial cells and expelled into ducts when surrounding myoepithelial cells contract

- Lactation involves milk production by the mammary alveolar cells and movement of that milk towards the nipple during a feed.
- During pregnancy, oestrogen, progesterone and other hormones develop the ducts and milk-producing tissue, while high placental hormone levels limit copious milk secretion.
- After placental delivery, the fall in progesterone allows secretory activation, and milk volume usually increases over the next few days.

Hormonal Control of Lactation

A. Prolactin and Milk Production

- Suckling reduces hypothalamic dopamine inhibition and promotes prolactin release from the anterior pituitary.
- Prolactin supports milk synthesis, while effective and regular milk removal helps maintain the supply through local feedback mechanisms.
- Long gaps, ineffective attachment or unnecessary supplementation can reduce breast stimulation and contribute to falling production.

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B. Oxytocin and Milk Ejection

- Suckling and other infant-related cues promote oxytocin release from the posterior pituitary.
- Oxytocin contracts the myoepithelial cells around the alveoli, moving milk into the ducts; this is the milk-ejection or let-down reflex.
- Pain, fear and stress can temporarily interfere with let-down, so comfort and reassurance are clinically useful.
- Oxytocin also contributes to postpartum uterine contraction, which may cause noticeable after-pains during feeds.

Stages of Lactation

1. Secretory Differentiation

- The mammary epithelium develops its milk-producing capacity during pregnancy.

2. Secretory Activation

- Placental delivery removes progesterone inhibition and permits copious secretion over the next few days.

3. Maintenance of Established Lactation

- Regular effective milk removal and hormonal support maintain production.

4. Involution After Weaning

- Reduced milk removal gradually leads to reduced secretion and regression of secretory tissue.

Lactation Stages at a Glance

Stage	Main physiological event
Secretory differentiation	The mammary epithelium develops its milk-producing capacity during pregnancy.
Secretory activation	Placental delivery removes progesterone inhibition and permits copious secretion over the next few days.
Maintenance of established lactation	Regular effective milk removal and hormonal support maintain production.
Involution after weaning	Reduced milk removal gradually leads to reduced secretion and regression of secretory tissue.

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Types of Breast Milk

1. Colostrum

- Colostrum has relatively more immune proteins and less fat and lactose than mature milk.
- Colostrum is the small-volume early milk that is well suited to the newborn and contains protective immune factors, including secretory IgA.
- It should be fed to the baby rather than discarded because of its colour or thickness.

2. Transitional Milk

- Transitional milk gradually becomes mature milk during the early weeks after delivery.

3. Mature Milk

- Mature milk supplies water, lactose, fat, proteins and protective factors, while its composition changes with lactation and infant needs.

Variation During Feeding and Health Benefits

- Milk changes over time and during a feed, so fixed descriptions of two completely separate types of foremilk and hindmilk can be misleading.
- Breast milk provides nutrition, supports immune protection and allows close responsive interaction between the mother and baby.
- Breastfeeding also benefits maternal health, including lower long-term risks of breast and ovarian cancer, while contraceptive protection depends on strict conditions.

Supporting Successful Breastfeeding

Timing and Feeding Pattern

Initiation, Exclusive and Continued Breastfeeding

- Support early uninterrupted skin-to-skin contact and initiation within the first hour when the mother and baby are clinically stable.
- Exclusive breastfeeding for the first six months means breast milk without other foods or drinks, including water, except indicated medicines, supplements or oral rehydration solution.
- Introduce suitable complementary foods at six months and continue breastfeeding to two years or beyond according to the family's circumstances and preferences.

Responsive Feeding and Infants Needing a Plan

- Feed responsively to early cues such as stirring, rooting and bringing hands to the mouth, rather than waiting for crying or using a rigid timetable.
- Many newborns feed eight to twelve times in 24 hours, but the clinical assessment of effective feeding matters more than a fixed count alone.

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- A sleepy, premature, jaundiced or unwell baby may need a planned feeding schedule and skilled assessment rather than waiting for cues.

Positioning and Deep Attachment

Position the Mother and Baby

- Help the mother sit or lie comfortably with support, and bring the baby close rather than leaning the breast towards the baby.
- Keep the baby's head and body aligned, with the whole body facing the mother and the nose initially opposite the nipple.
- Support the shoulders and body without pressing hard on the back of the head, allowing the head to extend slightly as the mouth opens.
- Cradle, cross-cradle, football and side-lying holds are options; choose the position that fits comfort, recovery and the baby's needs.



Cradle



Cross-cradle



Football hold



Side-lying

Cradle, cross-cradle, football and side-lying positions can support feeding; side-lying requires an awake caregiver and is not an infant sleep arrangement

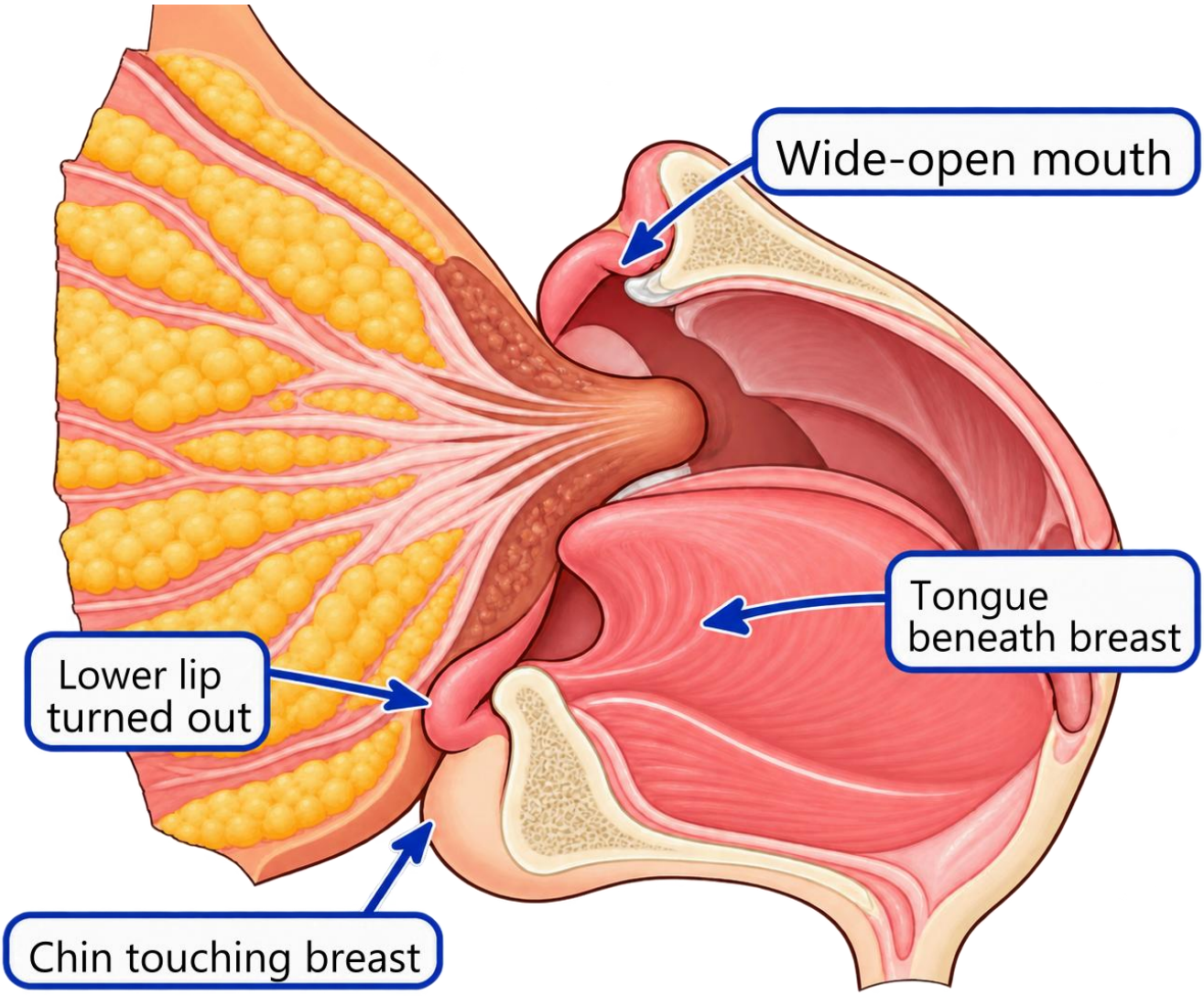
- Side-lying feeding requires an awake, attentive caregiver and does not replace a separate safe sleep arrangement for the infant.

Recognise Good Attachment

- Wait for a wide-open mouth and bring the baby to the breast with the chin leading, so that a generous amount of breast tissue enters the mouth.

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- The chin touches or nearly touches the breast, the lower lip turns outwards and more areola is often visible above the mouth than below.
- The cheeks stay rounded, sucking becomes slow and deep with pauses, and swallowing can be seen or heard as milk transfer becomes established.
- Persistent pinching pain, clicking, repeated slipping or a compressed nipple after the feed suggests that attachment needs review.



A wide-open mouth and deep attachment help the infant transfer milk effectively without pinching the nipple

- If repositioning is needed, gently break suction before removing the baby and try again with support rather than pulling the nipple out.

Assess Whether the Baby Receives Enough Milk

Assessing Transfer, Output and Growth

- Observe a complete feed when there is concern, rather than deciding from breast size or the mother's anxiety alone.
- Review swallowing, feeding frequency, urine and stool pattern, weight change, hydration, jaundice and the baby's general condition.
- After milk supply is established, regular pale urine and an appropriate weight trajectory support adequate intake, but no single sign is sufficient in isolation.

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