



University of Baghdad

College of Medicine 2024-2025

Title: INFANT FEEDING (1)

Grade: Fifth grade

Module: Pediatrics

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Objective



Introduction.

- **Selected Beneficial Properties of Human Milk Compared to Infant Formula.**
- **Protective Effect Suggested to be in Human Milk.**
- **What is the Colostrum?**
- **Advantages , Contraindications and problems associated with breast feeding.**
- **Problems affect successful breast feeding.**
- **The Factors that conductive to successful breast-feeding**



- **The dramatic growth of infants during the first year of life and continued growth, even though at lower rates, from one yr. of age through adolescence impose unique nutritional needs.**
- **Because the rapid rates of growth are accompanied by marked developmental changes in organ function and composition, failure to provide sufficient nutrients during this time is likely to have adverse effects on development as well as growth.**

Breast feeding

The American Academy of Pediatrics (AAP) and World Health Organization (WHO) have declared :-

(Breastfeeding and the administration of human milk to be the normative practice for infant feeding and nutrition).



Mother's milk vs. formula milk

- **Human milk is designed to support the development of large brains, capable of processing and storing lots of information.**
- **Cows milk is designed to support functions, like constant grazing.**



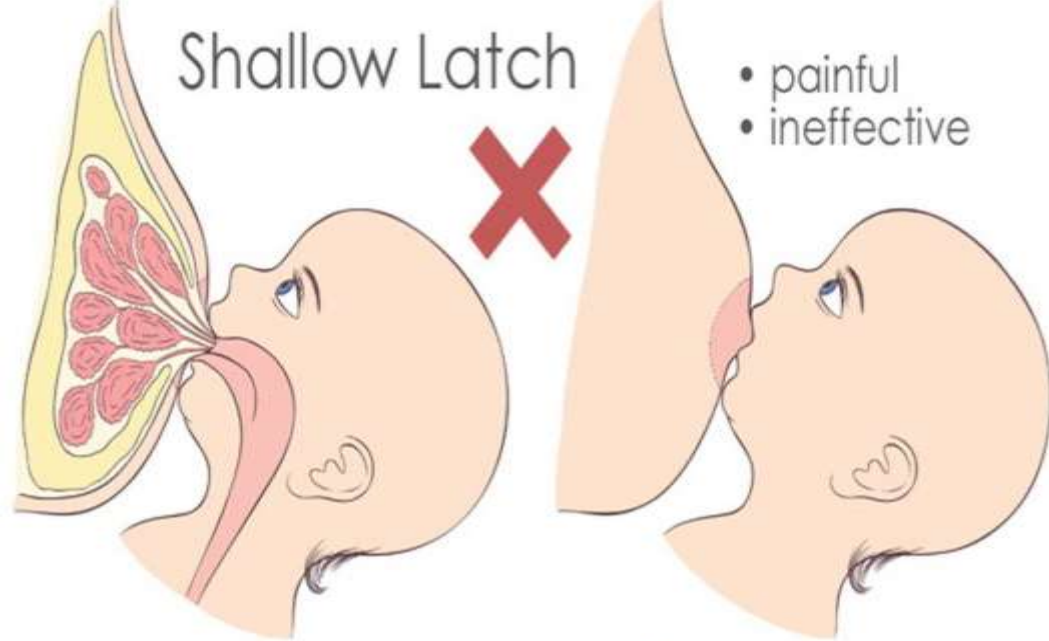
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- Breastfeeding should be continued with the introduction of complementary foods for 1 year or longer, as mutually desired by mother and infant.
- Feedings should be initiated soon after birth unless medical conditions preclude them.
- New mothers should be instructed about infant hunger cues, correct nipple latch, positioning of the infant on the breast, and feeding frequency.



www.NurturingMilk.com



Signs of correct latch



- It is also suggested that someone trained in lactation observe feeding to evaluate positioning, latch, milk transfer and maternal responses, and infant satiety.



- Attention to these issues during the birth hospitalization allows dialogue with the mother and family and can prevent problems that could occur with improper technique or knowledge of breastfeeding.
- As part of the discharge teaching process, issues surrounding infant feeding, elimination patterns, breast engorgement, basic breast care, and maternal nutrition should be discussed.
- **A follow-up appointment is recommended within 24-48 hr after hospital discharge.**

Ideally, immediately after birth the baby will be placed naked on his mother's naked body (they can be both covered if necessary) and left like this until he is ready to breastfeed.





- An estimated 78 million babies – or **three in five** – are not breastfed within the first hour of life, putting them at higher risk of death and disease and making them less likely to continue breastfeeding.
(UNICEF and WHO in 2018.)

- Breast-feeding is associated with a reduced incidence of **obesity**, **diabetes mellitus** and **hypertension** in later life.
- Also it is associated with a reduced risk of childhood cancer, including **leukaemia** and **neuroblastomas**.(BJC 2024)

Exclusive breast-feeding in early infancy is life-saving in developing countries.

41% of newborns that die in the first month of life could be saved if breastfed in the first hour of life.



Journal of Pediatrics (2006)

Advantages of breast-feeding for the infant are:

- 1- Reduced risk of developing gastroenteritis , otitis media, and lower respiratory tract infections.
- 2- Protective effect against necrotizing enterocolitis in extremely preterm infants.
- 3- Overall increase in IQ (intelligence quotient) score by approximately 3 points.
- 4- Reduction in risk of SIDS (sudden infant death syndrome).
- 5- Lower incidence of obesity, diabetes mellitus and hypertension in later life.



Advantages for the mother are:

- 1- Promotes close attachment between mother And baby.
- 2- Delays return of menstruation, allowing iron stores to replenish following pregnancy and childbirth; this also helps with birth spacing.
- 3- Burns energy stores, helping a return to pre-pregnancy weight.
- 4- Lowers the risk of developing postnatal depression.
- 5- Stimulates the release of oxytocin, which causes the muscles in the uterus to contract, helping to reduce postpartum blood loss.
- 6- Reduces risk of breast and probably ovarian cancer.
- 7- Is economical, as it does not require the purchase of feeding and sterilizing equipment and infant formula.



Selected Beneficial Properties of Human Milk Compared to Infant Formula

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1- Anti-infective properties

1-Secretory immunoglobulin A (SigA), the primary protective agent, which coats the intestinal mucosa and prevents bacteria from entering the cells.

•2- Human milk oligosaccharides, which function as prebiotics, preventing pathogenic bacteria from attaching to mucosal surfaces.

3- White blood cells, which can kill micro-organisms.

4- Whey proteins (lysozyme and lactoferrin), which can kill bacteria, viruses and fungi.

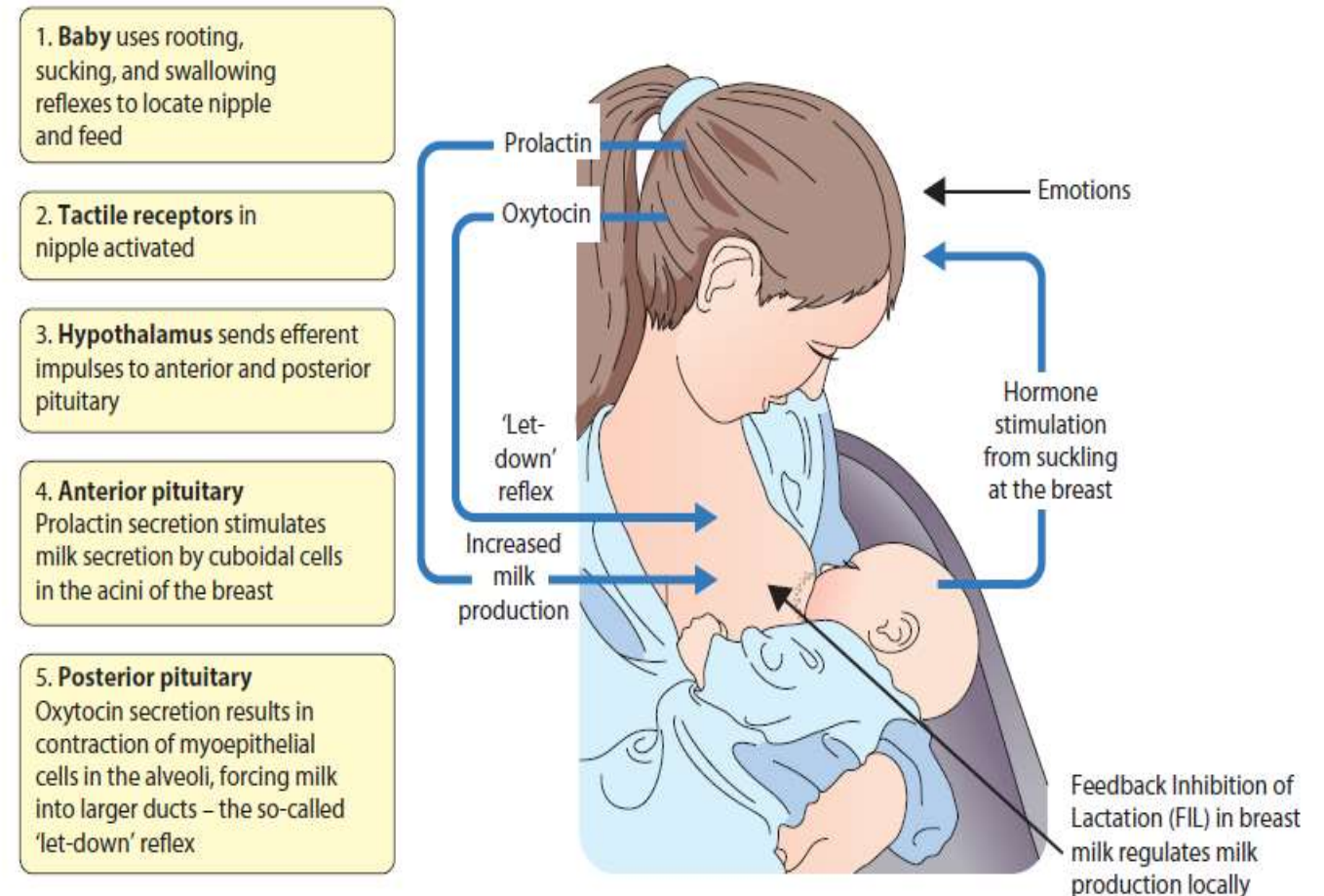
In the first few days of life, the volume of milk is low, but water or formula supplements are not required while the supply of breast milk is becoming established.



An effective latch, (i.e. attachment of the baby to the mother's Breast) is essential to ensure good milk transfer and prevent nipple trauma.

Healthy, term babies often lose 7%–10% of their birth weight, but should regain their birth weight by 14 days.

A baby who loses more than 10%, or fails to regain birth weight by 14 days, should be assessed to rule out an underlying medical problem.



2- Nutritional properties

A- Protein quality More easily digested curd
(60 : 40 whey : casein ratio).

B- Lipid quality Rich in oleic acid (with palmitate in C-2 position).
Improved digestibility and fat absorption Enhanced lipolysis lipase.

C- Calcium phosphorus ratio of 2 : 1

:Prevents hypocalcaemic tetany and improves calcium absorption.

D- Renal solute load: Low.

E- Iron content: Bioavailable (40–50% absorption).

F- Long-chain polyunsaturated fatty acids: Structural lipids; important in retinal development.



Conditions for Which Human Milk Has Been Suggested to Possibly Have a Protective Effect

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Acute disorders

Diarrhea

Otitis media

Urinary tract infection

Necrotizing enterocolitis

Septicemia

Infant botulism

Insulin-dependent diabetes mellitus

Celiac disease

Crohn's disease

Childhood cancer

Lymphoma

Leukemia

Recurrent otitis media

Allergy

Obesity and overweight

Hospitalizations

Infant mortality



Potential complications of breast-feeding:



- 1- **Unknown intake.** Volume of milk intake not known.
- 2- **Transmission of infection.** Maternal CMV, hepatitis B and HIV – increases risk of transmission to the baby.
- 3- **Breast-milk jaundice.** Mild, self-limiting, unconjugated hyperbilirubinaemia; continue breast-feeding.
- 4- **Transmission of drugs.** Antimetabolites and some other drugs contra-indicated.
- 5- **Nutrient inadequacies.** Breast-feeding beyond 6 months without timely introduction of appropriate solids may lead to poor weight gain and rickets.
- 6- **Vitamin K deficiency.** Insufficient vitamin K in breast milk to prevent haemorrhagic disease of the newborn. Supplementation is required.
- 7- **Potential transmission of environmental contaminants**
Nicotine, alcohol, caffeine, etc.
- 8- **Less flexible.** Other family members cannot help or take part. More difficult in public places
- 9- **Emotional upset.** If difficulties or lack of success can be upsetting.

The AAP recommends

exclusive breast-feeding for a minimum of 4 mo. and preferably for 6 mo.



It is preferable to empty the 1st breast before offering the 2nd in order to allow complete emptying and therefore better milk production.



Perceived barriers and potential complications of breastfeeding



There are a number of reasons a mother may decide not to breastfeed. These include:-

- 1- Dislike of idea of breastfeeding or embarrassment.
- 2- Other family members cannot help or take part with feeding.
- 3- If the mother returns to work, it may make continuing breastfeeding for the recommended length of time more difficult.
- 4- Physical breast problems – sore, cracked nipples, thrush, mastitis, inverted nipples, inadequate milk supply.
- 5- Breast milk jaundice – mild, self-limiting, unconjugated hyperbilirubinaemia; advise to continue breastfeeding; assess infant if prolonged (>2 weeks).



6- Transmission of drugs – most are transmitted in very low concentration. A few maternal drugs, particularly antimetabolites, lithium, radioactive therapy.

7- Risk of transmission of maternal infection – maternal CMV, hepatitis B (if infant not protected) and HIV (breastfeeding not recommended in high-income countries; in low- and middle-income countries breastfeeding with fully suppressive maternal antiretroviral therapy is recommended).

8- In certain rare metabolic disorders (such as galactosaemia, glucose - galactose malabsorption, certain long chain fatty acid oxidation disorders), breastfeeding is contraindicated.



9- Tongue-tie, when the frenulum between the dorsum of the tongue and the base of the mouth is short and restricts movement of the tongue, has recently gained attention as a reason for difficulty to latch and feed effectively, to prolong feeding times and growth faltering. Treatment is division of the frenulum. There is considerable debate about indications and efficacy.

Colostrum:

(1) The earliest milk to be secreted, the daily volume is only 10-40 ml/day and it is sufficient to the newborn baby.



(2)) It is lemon color, thick, sticky, alkaline, with high sp. Gravity (1.040-1.060).

(3) It is very rich in proteins, vit. A, and Nacl.

(4) Less amounts of fat , CHO (as lactose) ,
And potassium.





(5) Contains high concentrations of leukocytes, which can destroy disease-causing bacteria and viruses.

(6) It has unique immunological factors such as : IgA ,IgG ,IgM , lysosomes and lactoferrin.

(7) It has a mild laxative effect, encouraging the passing of the baby's first stool, which is called meconium.



8- Mothers body produces colostrum for up to about **five days** after baby is born.

9- It is changed to **transitional milk** around this time. transitional milk includes high levels of fat, lactose, and water-soluble vitamins. It contains more calories than colostrum.

10- Changes again to **mature milk** after about **14 days**. is thinner than transitional milk and more watery or even bluish.

11- **Traces** of colostrum are present in breast milk for up to **six weeks**.



Problems associated with breast feeding

1-Nipple Pain

Nipple pain is one of the most common complaints of breastfeeding mothers in the immediate postpartum period. **Poor infant positioning** and **improper latch** are the most common reasons. If the problem persists and the infant refuses to feed, consideration needs to be given to **nipple candidiasis**.



2-Engorgement

The breasts are firm, overfilled, and painful the cause may be incomplete removal of milk.

Frequent breastfeeding or, in some cases, with a combination of hot compresses and manual milk expression before breast Feeding.



3-Mastitis

2-3% of lactating , (u) unilateral.

C/F: localized warmth, tenderness, edema, and erythema after the 2nd post-delivery week.

m.o: **Staph. aureus, E.coli, group A strept , H. influenzae, Klebsiella pneumoniae, and Bacteroides spp.**

Diagnosis is confirmed by physical examination.

Oral antibiotics and analgesics, while promoting breast-feeding or emptying of the affected breast



4-Milk Leakage

common event

milk is involuntarily lost from the breast either in response to breast-feeding on the opposite side or as a reflex in response to other stimuli, such as an infant's cry. Milk leakage usually resolves spontaneously as lactation proceeds.





5-Inadequate Milk Intake

may be due to:-

- 1- insufficient milk production or
 - 2- failure of established breast-feeding,
- but also fetal cause that prevent proper breast stimulation.
breast-fed neonates must feed a minimum of 8 times per day.

6- Jaundice

Breast-feeding jaundice is a common reason for hospital readmission of healthy breast-fed infants.

Breast milk jaundice causes persistently high serum bilirubin in a thriving healthy baby.





**Lactating woman supplies
800-850 ml/day of milk which
is equal to energy loss of 600 kcal.
The diet of a lactating woman should
be rich in minerals, protein and
vitamins.**

Antimicrobial property of breast milk:

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(a) Antibodies (Ig against bacteria & viruses) and relatively high conc. of secretory IgA.



(b) Phagocytic cells (granulocyte: macrophage ,lymphocytes, 90% of which are T- lymphocytes).

(c) Enzymes (lysozyme ,lacto-peroxidase).

(d) Proteins (lactoferrin ,the iron -binding whey protein which inhibit the growth of *E.coli*).

(e) Resistant factors against staphylococci and bile salt- stimulated lipase kills *Giardia lamblia* and *E.histolytica*.



(f) The lower pH of the stool of breast-fed infants is thought to contribute to the favorable intestinal flora of infants fed human milk compared with formula (more bifidobacteria and lactobacilli; fewer *Escherichia coli*).

(g) Complements .

(i) Interferon-producing cells.



Contraindication of breast-Feeding in the baby:

- 1-Inborn error of metabolism (like Galactosemia ,Primary disaccharidase deficiency & phenylketonuria).
- 2-Severe physical abnormalities as bilateral cleft palate & cleft lip.
- 3-Weak and premature infants.
- 4-Cerebral anoxia.
- 5-Severe dyspnea as RDS& HF.



- Milk from the mother whose diet is sufficient and properly balanced will supply all the necessary nutrients except **fluoride** and **vitamin D**.

- The vitamin D intake should be 400 IU/day, starting in the first few days of life for all breast-fed infants.
(AAP 2008)





The iron content of human milk is low, but most normal term infants have sufficient iron stores for the 1st 4–6 mo. of life. Human milk iron is well absorbed. Nonetheless, by 4–6 mo. of age, the breast-fed infant's diet should be supplemented with iron-fortified complementary foods and/or a ferrous iron preparation.

- The vitamin K content of human milk also is low and may contribute to hemorrhagic disease of the newborn. Parenteral administration of 1 mg of vitamin K at birth is recommended for all infants, and this is especially important for those who will be breast-fed.**

PROBLEMS AFFECT SUCCESSFUL BREAST FEEDING

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Retraction or indentation of nipple
ADAM.

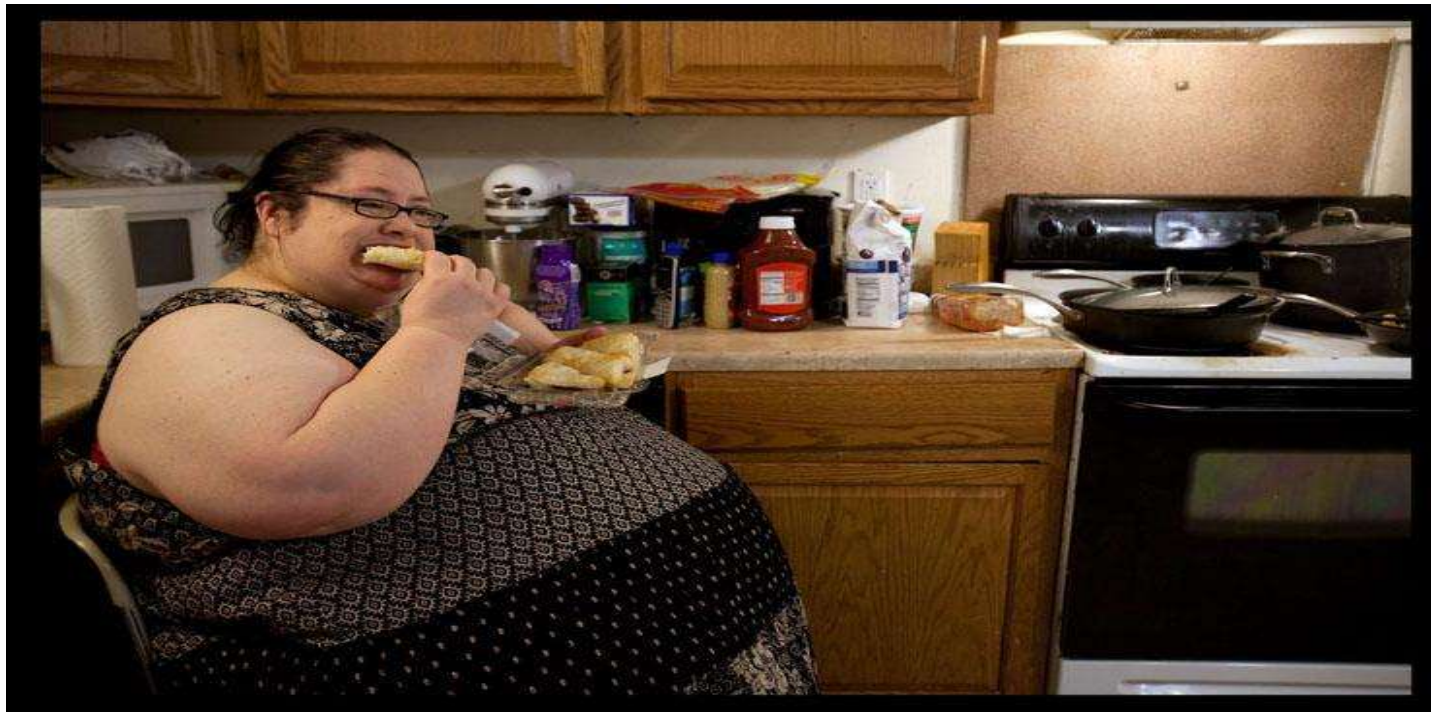
1- Retracted nipples usually benefit from daily manual breast-pump suction during the latter weeks of pregnancy.

2- Truly inverted nipples may be helped by the use of milk cups, starting as early as the 3rd month of pregnancy.



3-Weight gain

If the mother's diet is **adequate**, she need not gain or lose weight while breast-feeding. Nursing will help the uterus return to its normal size sooner and also may help the mother return to her pre-pregnancy weight sooner.



4- Breast size

Many women must be reassured that breast tone will be preserved by the use of a properly fitted brassiere to support the breasts, especially before delivery and during the nursing period. ***Breast-feeding has no long-term adverse cosmetic effects on the breast appearance.***



Q- Is it necessary to stop breast feeding in pregnant mother?





A-Pregnancy does not necessitate immediate cessation of nursing, but the combined demands of supplying milk to the infant and supplying nutrients to the developing fetus are formidable, necessitating special attention to maternal nutrition.

Q- What are the Factors that conducive to successful breast-feeding?





1-Good nutritional health.

2- Proper balance of rest and exercise.

3- Freedom from worry.

4- Early and sufficient treatment of any intercurrent disease.

5- And adequate nutrition.

Summary



- **Proper nutrition is crucial in promoting the normal growth & development.**
- **Colostrum is the earliest milk to be secreted It is lemon color, thick, sticky, rich in proteins but less amounts of fat & CHO .**
- **Advantages of Breast Feeding could be summarized as:- Easier , safer, fewer feeding difficulties ,emotional satisfaction and antimicrobial property.**
- **Assessing and managing the problems that affect successful breast feeding.**



من أجل الأطفال، علينا أن نبدأ التغيير في أكبر وقت وفي أكبر مكان



باعتادنا جميعاً أن نتساءل عن عملنا
ملائة من شأنه أن يغير حياة الأطفال

THANK YOU

