MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATION OF THE REPUBLIC OF UZBEKISTAN

TASHKENT STATE MEDICAL UNIVERSITY

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BREASTFEEDING

Educational and methodological manual

Branch of education:	510000 -	Healthcare
Direction of education:	5510100 -	General medicine
	5111000 -	Vocational education (General medicine 5510100)

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RATIONAL NUTRITION AND BREASTFEEDING

Educational and methodological manual for students of the center for retraining and improving the quality of teachers of medical universities TSMU

The educational manual was discussed at the TSMU Center. 2025 "___"_____ Protocol №._____

The educational and methodological manual was approved by the Academic Council of TSMU. 2025 "___"_____ Protocol №._____

Learning objectives

The following topics will be covered:

- Exclusive breast feeding and components of breast milk
- Correct Technique: Proper breastfeeding attachment and position
- Contraindications to breastfeeding
- Advantages of breastfeeding for the baby
- Variations in composition of breast milk
- Assessing if breast milk is adequate for the baby
- Difficulties associated with breastfeeding and their solutions

Breast Milk: Optimal Nutrition!!

- 41.6% children under 3 yrs are breastfed within 1 hour of birth
- 54.9% children under 6 months receive exclusively BF
- Exclusive BF prevents 13% Under-5 deaths/year globally
- BF within first hour of birth: Reduces 22% of all newborn deaths

(NFHS-4, 2015–2016)

Ten steps to successful breastfeeding

WHO and UNICEF launched the Baby-friendly Hospital Initiative (BFHI) in 1991 to help motivate facilities providing maternity and newborn services worldwide to implement the Ten Steps to Successful Breastfeeding. The Ten Steps summarize a package of policies and procedures that facilities providing maternity and newborn services should implement to support breastfeeding. In 2018, WHO revised the Ten Steps based on the 2017 guideline on protecting, promoting and supporting breastfeeding in facilities that provide maternity and newborn services.

WHO has called upon all facilities providing maternity and newborn services worldwide to implement the Ten Steps. The implementation guidance for BFHI focuses on integrating the programme across healthcare systems to facilitate universal coverage and ensure sustainability over time. The guidance outlines nine key national responsibilities to scale up implementation of the Ten Steps.

Critical management procedures:

1a. Comply fully with the *International Code of Marketing of Breast-milk Substitutes* and relevant World Health Assembly resolutions.

1b. Have a written infant feeding policy that is routinely communicated to staff and parents.

1c. Establish ongoing monitoring and data-management systems.

2. Ensure that staff have sufficient knowledge, competence and skills to support breastfeeding.

Key clinical practices:

3. Discuss the importance and management of breastfeeding with pregnant women and their families.

4. Facilitate immediate and uninterrupted skin-to-skin contact and support mothers to initiate breastfeeding as soon as possible after birth.

5. Support mothers to initiate and maintain breastfeeding and manage common difficulties.

6. Do not provide breastfed newborns any food or fluids other than breast milk, unless medically indicated.

7. Enable mothers and their infants to remain together and to practise rooming-in 24 hours a day.

8. Support mothers to recognize and respond to their infants' cues for feeding.

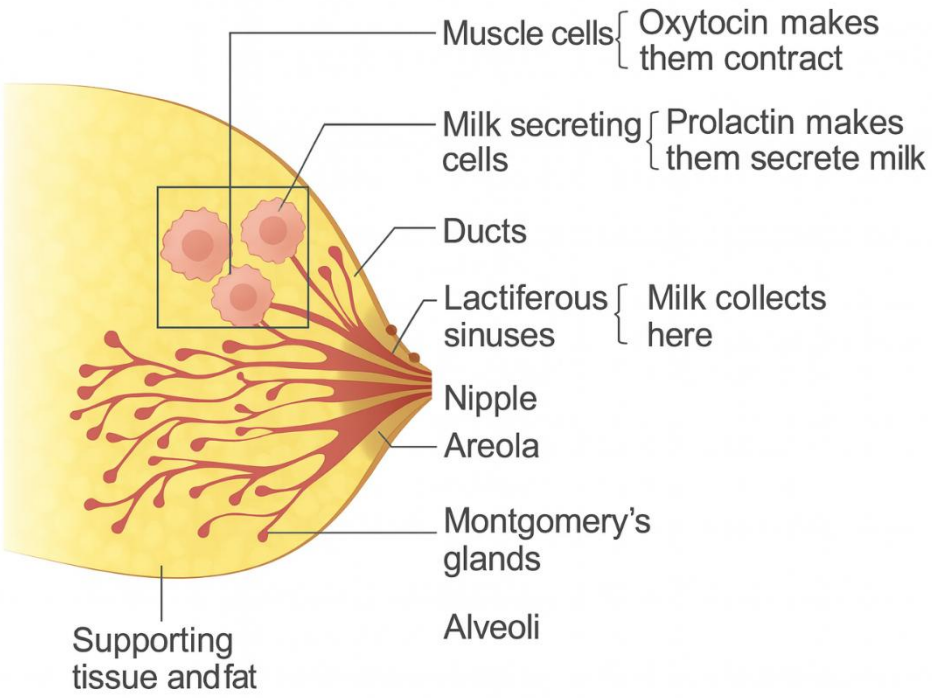
9. Counsel mothers on the use and risks of feeding bottles, teats and pacifiers.

10. Coordinate discharge so that parents and their infants have timely access to ongoing support and care.

There is substantial evidence that implementing the Ten Steps significantly improves breastfeeding rates. A systematic review of 58 studies on maternity and newborn care published in 2016 demonstrated clearly that adherence to the Ten Steps impacts early initiation of breastfeeding immediately after birth, exclusive breastfeeding and total duration of breastfeeding.

Anatomy & Physiology of Lactation

- Consists of glandular tissue, supporting tissue & fat.
- Milk secreted by glands travels through tubules, which drain into lactiferous sinuses.
- Sinuses (storing small quantities of milk) lie below areola & open out to the nipple through lactiferous ducts.
- Each gland is surrounded by a thin layer of muscle (myo-epithelium); contraction of these causes milk ejection.



When should breastfeeding be initiated?

→ As soon as possible

→ Within 1 hour of childbirth

What is Exclusive breastfeeding?

- Baby should be given only breast milk & nothing else, not even sips of water, unless medically indicated.
- Exclusive breastfeeding must be done for the first 6 months of life.

What should be initiated at 6 months? (*"Weaning" contraindicated)*

Complementary feeding

→ Semi-solid, energy-dense food

→ Given in addition to breast milk after 6 months of age

What are the factors affecting breast milk output?

Breast milk output	
Increased by:	Decreased by:
Thought of baby	Stress, anxiety
Sight	Top feeds / formula feeds
Sound of baby	Feeding bottle/pacifiers
Night time feeds	*Nipple confusion*

Rational nutrition

Recommended Daily Energy Requirements

- Children ≤ 10 kg body weight: ~100 kcal per kg of body weight.
- Children 10–20 kg body weight: 1000 kcal plus an additional 50 kcal for every kilogram above 10 kg.
- Children > 20 kg body weight: 1500 kcal plus an additional 20 kcal for every kilogram above 20 kg.

Recommended Daily Protein Requirements

Group	Age	Protein Requirement
Infants	0–6 months	1.2 g/kg/day
	6–12 months	1.7 g/kg/day
Children	1–3 years	17 g/day
	4–6 years	20 g/day
	7–9 years	30 g/day
	10–12 years	40 g/day
Adolescents (Boys)	13–15 years	54 g/day
	16–17 years	62 g/day
Adolescents (Girls)	13–15 years	52 g/day
	16–17 years	56 g/day

Breast Milk & Breastfeeding

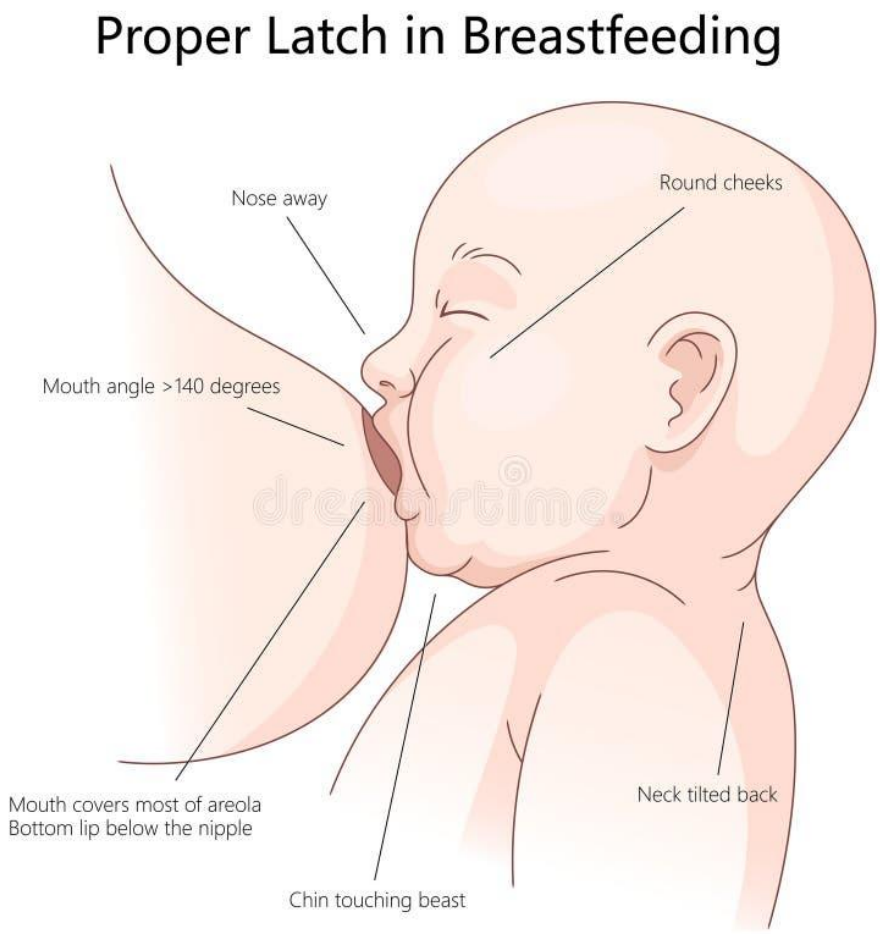
- *Exclusive breastfeeding* means the infant receives only breast milk, with no additional fluids such as water, except when medically necessary.
- *Colostrum* is highly valuable for the newborn and should always be provided.
- *Pre-lacteal feeding* of any type is strongly discouraged.
- *Complementary feeding* refers to the introduction of semisolid foods alongside continued breastfeeding

Indicators of Proper Positioning During Breastfeeding

- The infant’s body must be adequately supported.
- The baby should face directly toward the mother.
- The head, shoulders, and buttocks should be aligned in a straight line.
- The baby’s abdomen should rest closely against the mother’s abdomen.

Indicators of Effective Attachment During Breastfeeding

- The baby’s mouth should be opened widely.
- Most of the areola should be inside the baby’s mouth, with only a small portion of the upper areola visible.
- The infant’s lower lip should be turned outward.
- The baby’s chin should be in close contact with the mother’s breast.



Effective Suckling

- Effective suckling is when the infant shows slow deep sucks, sometimes pausing
- If infant is not sucking well, then look for ulcers and white patches in the mouth (Thrush)

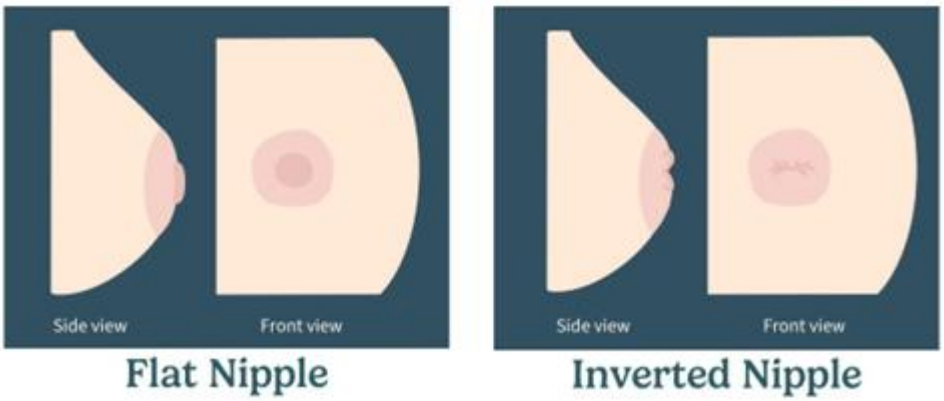
Breastfeeding problem №1. Inverted/flat nipples

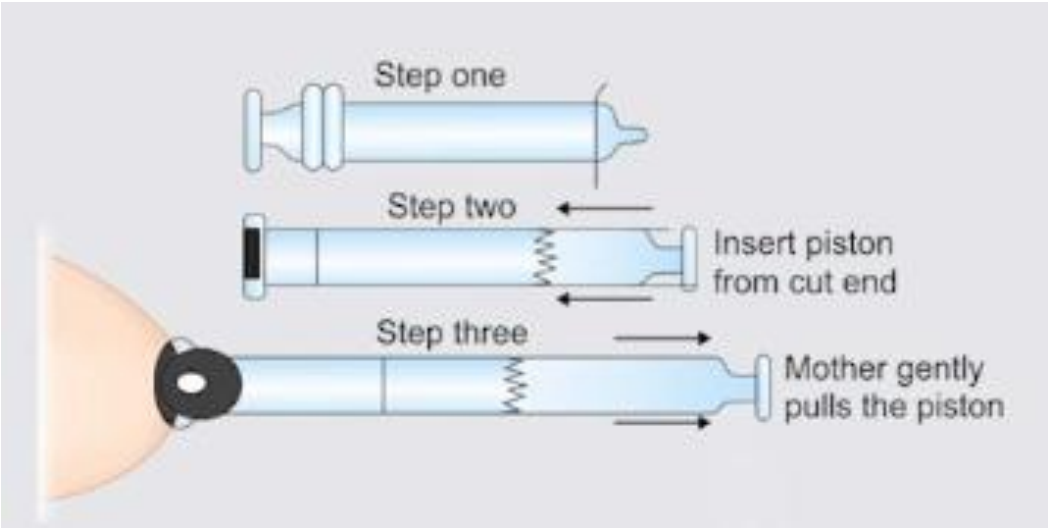
- Flat or short nipples which protract well (become prominent or pull out easily)

– Do not cause difficulty in BF

- Inverted cause difficulty in attachment to breast
- Diagnosis: Should be diagnosed in antenatal period
- Treatment:

- Started soon after birth
- Nipple is manually everted, stretched and rolled out several times a day
- A plastic syringe can be used





Breastfeeding problem №2. Sore Nipple

Causes

- Incorrect attachment of the baby to breast
- Frequent washing with soap and water
- Pulling the baby off the breast while he is still sucking
- Candida infection of nipple
- Treatment
- Correct positioning and attachment of the baby to the breast
- Hind milk should be applied to the nipple after a feed and the nipples should be aired, to allow healing in between feeds
- If fungal infection is suspected, treat with antifungal medication

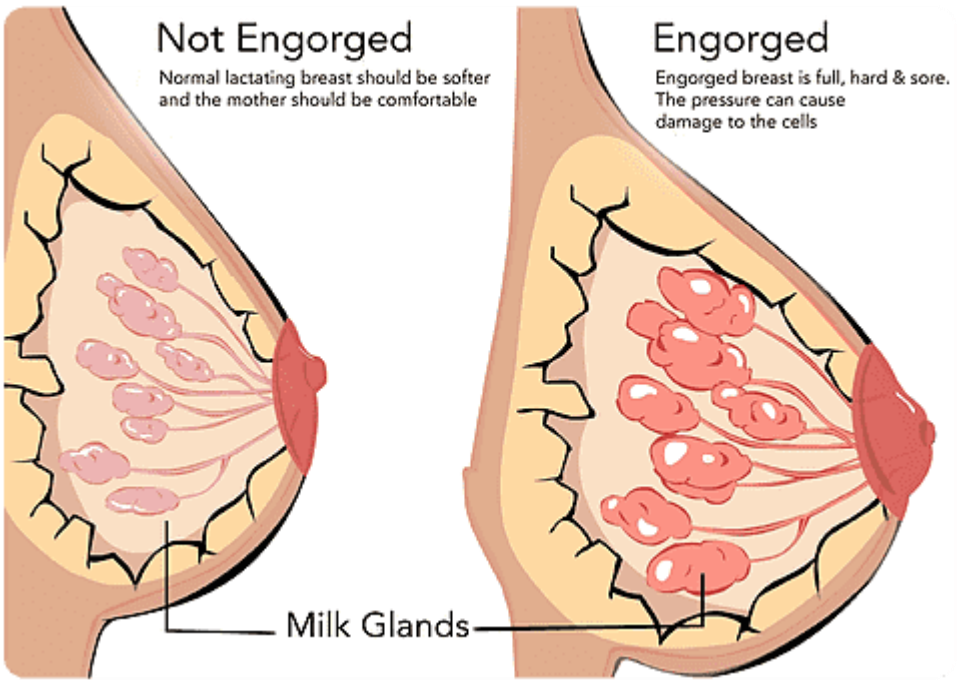
Breastfeeding problem №3. Breast engorgement

Causes

- Milk production increases during 2nd and 3rd day after delivery.
- If feeding is delayed or infrequent or the baby is not well positioned at the breast, milk accumulates in the alveoli.
- Such a breast becomes swollen, hard, warm and painful.
- Prevention
- Early and frequent feeding along with correct attachment of the baby to the breast.

Treatment

- Local warm water packs and analgesics (Paracetamol) to relieve pain.
- Express milk to soften the breast.
- Counsel regarding proper attachment & position.



Breastfeeding problem №4. Breast abscess

Causes

- Untreated congested, engorged breast, an infected cracked nipple, or a blocked duct

Clinical features

- Maternal high-grade fever and a raised blood count

Treatment

- Treat mother with analgesics and antibiotics
- Drain the abscess
- Continue breastfeeding from the other breast

Reduced Milk Supply / Not Enough Milk

Reassurance is needed if

- Baby is gaining weight adequately
- Passing urine 6–8 times/day
- Baby sleeps for 2–3 hrs after each feed

Common causes

- Not breastfeeding often enough
- Too short or hurried breastfeeds
- Poor attachment
- Poor oxytocin reflex
- Breast engorgement or mastitis

Treatment

- If baby is not gaining weight adequately, ask mother to feed the baby more frequently especially enforcing nighttime feeds
- Counsel regarding correct BF position and attachment
- Back massage is especially useful for stimulating lactation
- Advice KMC (Kangaroo Mother Care) for VLBW babies
- Treat sore nipple / engorged breast or mastitis

Counselling & Expression: Key Components

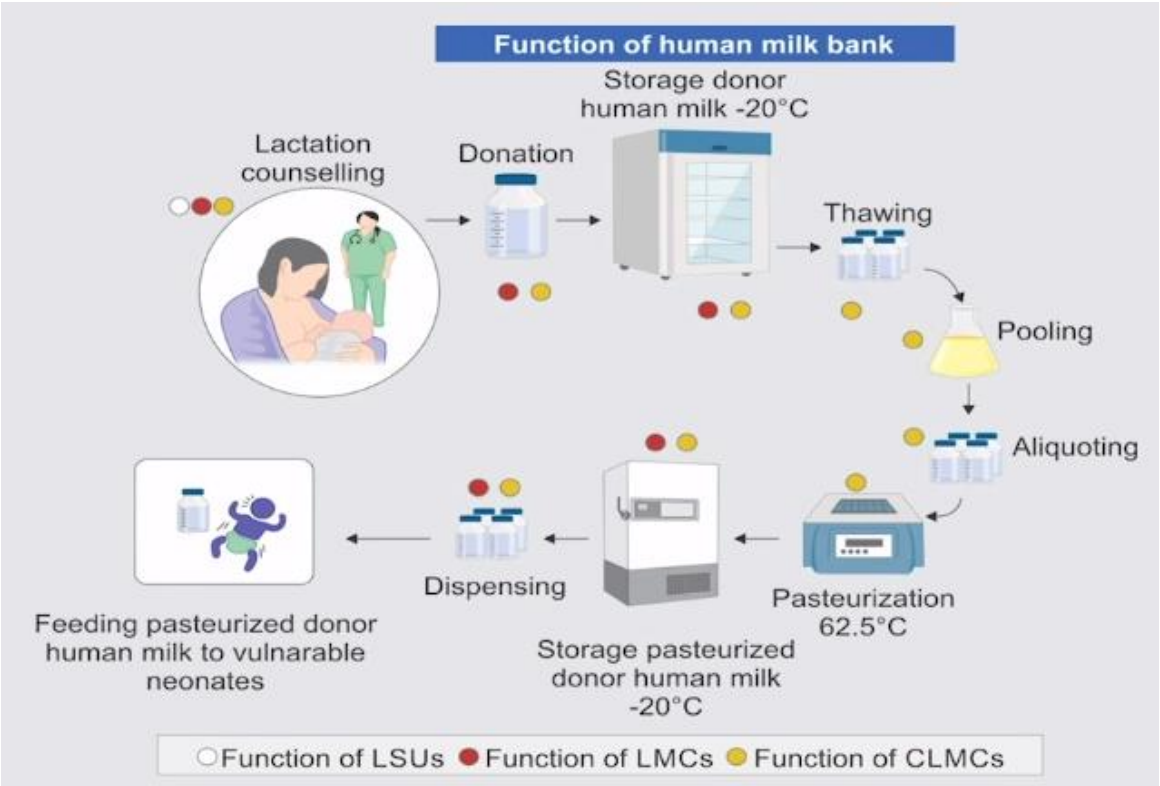
- Time to milk coming in: Daily milk volume tracked
  – Three consecutive expression volume of >20 ml is indicator of milk coming in

- Coming in of volume

  – 3 consecutive days of >500 ml by day 7 is indicator of successfully coming in of volume
- Skin to skin contact improves milk volume and helps quicker transition to full breastfeeding
- CLMC (**Comprehensive Lactation Management Centre)** should be hub for augmenting newborn care

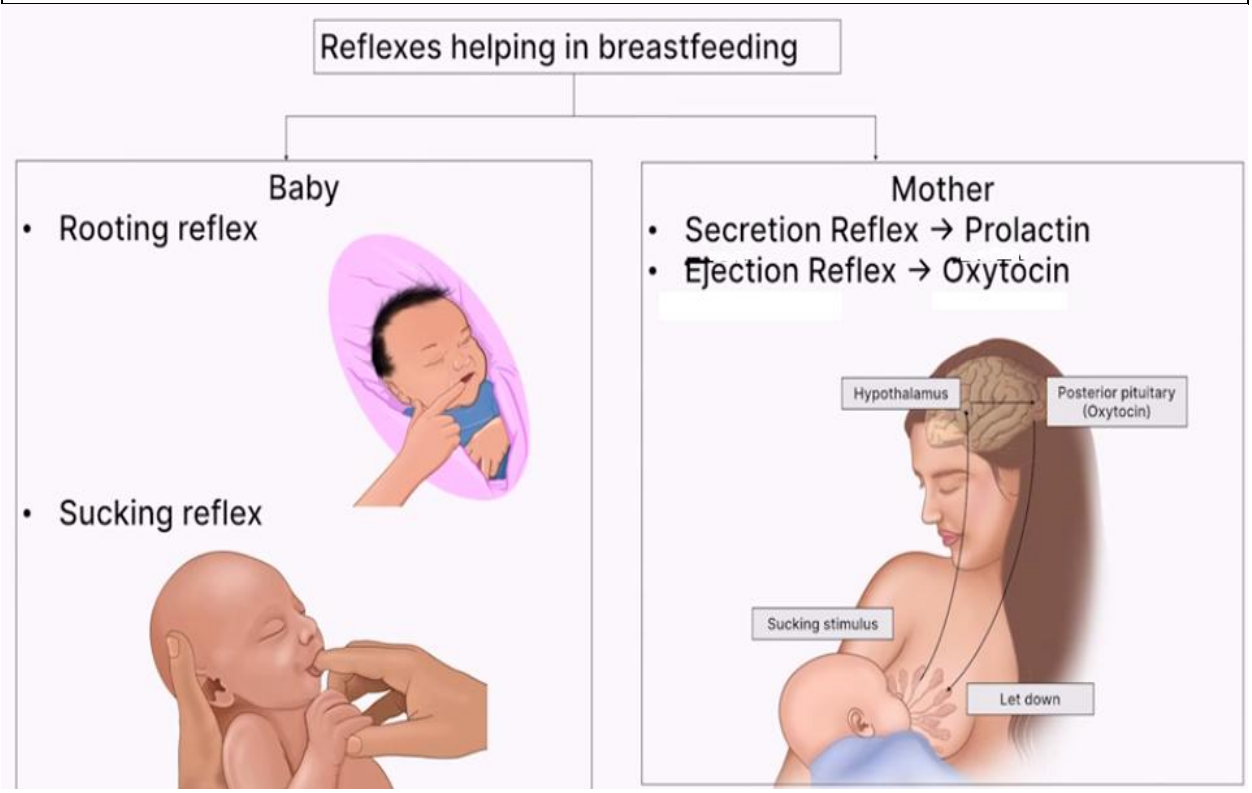
  CLMC is a specialized facility established in hospitals to:
- Promote, support, and protect breastfeeding.
- Provide expressed breast milk (especially donor milk) for sick and preterm babies when mother's own milk is not available.
- Counsel mothers about proper breastfeeding techniques, positioning, and expression.
- Train healthcare staff in lactation management.
- Serve as a referral hub for complex lactation-related issues.

Role of lactation management centers in handling human milk

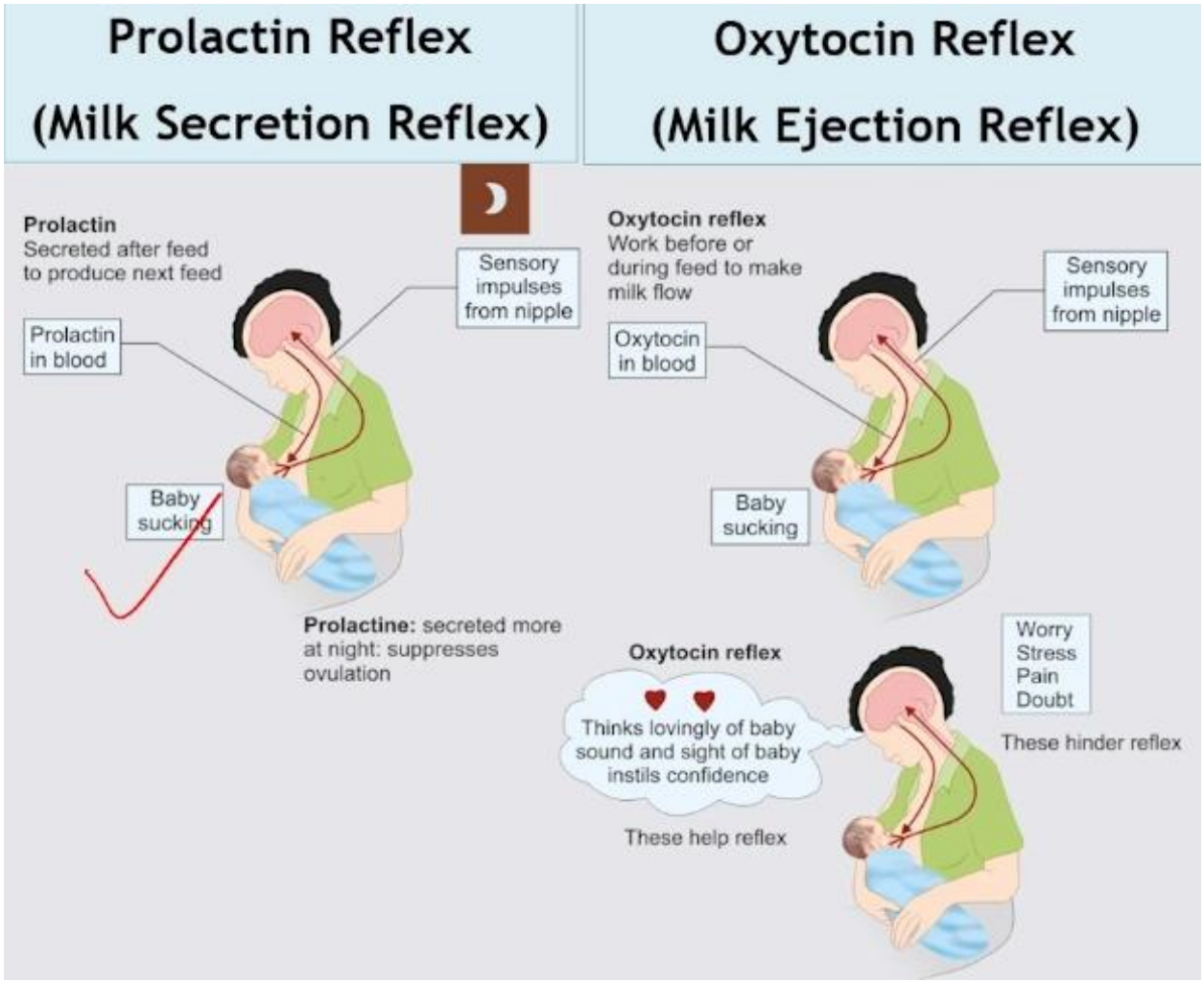


Reflexes Involved in Breastfeeding

Observed in	Reflex	Description
Mother	Milk Secretion Reflex	When the infant suckles, nerve signals reach the anterior pituitary, leading to prolactin release, which stimulates further breast milk production.
Mother	Milk Ejection Reflex	Oxytocin causes the muscles around the mammary glands to contract, pushing milk out.
Baby	Rooting Reflex	Assists the infant in finding and latching onto the breast during feeding.
Baby	Suckling Reflex	Enables the infant to draw out and swallow breast milk effectively.



Physiology: Reflexes regulating lactation



Benefits of Breastfeeding for the Infant

1. **Complete Nutrition**
    - Breast milk supplies all the essential nutrients required for the first six months of life.
2. **Carbohydrates**
    - Contains higher levels of lactose than cow's milk, supporting better energy supply and gut health.
3. **Proteins**
    - Protein content is lower than in cow's milk, reducing solute load on the kidneys.
    - Rich in cysteine and taurine, which play a vital role in brain development.

- Contains more whey proteins (lactalbumin) that are easily digested, while cow's milk is higher in casein, which is harder to digest.

4. **Fats**
   - Provides a greater amount of polyunsaturated fatty acids (PUFAs).
   - Adequate levels of DHA (docosahexaenoic acid) promote optimal brain and eye development.
   - Breast milk is easier to digest due to the natural presence of lipase.

d. Minerals

- The calcium-to-phosphorus ratio in breast milk is optimal for calcium absorption.
- The iron in breast milk is more bioavailable and absorbed better than that in cow's milk.

e. Vitamins

- Breast milk provides sufficient amounts of nearly all vitamins, except vitamin D and vitamin K (and vitamin B12 in mothers who follow a strict vegan diet).

Other Benefits

2. Breastfed infants often demonstrate higher intelligence quotient (IQ) scores.

3. They have a reduced risk of dental caries, diabetes, obesity, and hypertension later in life.

4. Breast milk contains protective anti-infective agents that guard against infections and necrotizing enterocolitis (NEC).

5. It also fosters a strong emotional bond between mother and child.

Benefits of Breastfeeding for the Mother

1. Oxytocin released during breastfeeding promotes uterine involution after delivery.

2. Breastfeeding delays ovulation, acting as a natural form of contraception.

3. It supports weight reduction and helps the mother return to her pre-pregnancy body weight.

4. Breastfeeding lowers the risk of breast and ovarian cancers.
5. It reduces the likelihood of osteoporosis and provides significant financial savings for the family.

Recommended Breastfeeding Practices

- Initiate soon after, preferably within half to one hour of birth
- Do not introduce Prelacteal feeds (ghutti, gripe water, honey or any other milk) – reduces breast milk intake
- Ensure exclusive breastfeeding during first 6 months of life (feeding only breast milk and medications if required)
- Breastfeed day and night
- Breastfeed on demand at least eight times or more per day
- Allow baby to feed at one breast till baby stops sucking and releases the breast. Then offer other breast if baby demands for more
- Adequacy of milk intake can be assessed by:

– 6–8 wet diapers per day

– Weight gain (20–30 g/day) in first 3–4 months

- Initiate complementary foods after 6 months of age
- Continue breastfeeding up to 2 years of age or beyond

Take Home Messages

- Mother's own milk (MOM) is the best feed for the baby
- Pasteurised donor milk is the next best option if MOM is not available
- CLMC's main function is to promote, protect and preserve breastfeeding for healthy babies and MOM feeding for NICU babies
- Milk donation by a mother to a CLMC is a voluntary activity
- Human milk banking is a highly skilled activity involving precision along with asepsis in collection, storage, processing, handling and disbursement of donor milk
- Donor milk should be used for as a 'short term life saving alternative' and **n**ot used as replacement for MOM

Comparison Between Human and Cow's Milk (per 100 mL)

Nutrients	Human Milk	Cow's Milk
Protein & Calories	1.1 g, 65 kcal	3.5 g, 67 kcal
Casein	30–40%; high in lactalbumin & whey protein (easily digestible)	~80%; rich in casein, often causes milk allergy & colic
Lactose	7.4 g	4.5 g
Fat	3.5 g; richer in PUFAs	4.0 g
Sodium & Potassium (mEq/L)	Na 6.5, K 14	Na 25, K 35 (both higher)
Osmolality (mOsm/L)	290	350 (higher)
Calcium/Phosphorus Ratio	>2 (favorable for Ca absorption)	<2
Vitamin K	1.5 µg	6.0 µg
Iron	0.29–0.45 mg (highly bioavailable)	0.01–0.38 mg (less bioavailable)
Vitamin D	0.5–10 IU	0.5–4.5 IU

Composition & Variations of Breast Milk

Breast milk is the most suitable and complete source of nutrition for infants. Its composition is dynamic and changes depending on the stage after birth, gestational age, and even within each feeding session.

1. Based on Time After Birth

- Colostrum
    - Produced during the first 2–3 days postpartum.
    - Thick, yellowish fluid rich in *immunoglobulin A (IgA)*, white blood cells, and proteins.

- Provides strong immune protection and serves as the ideal first food for the newborn.

- Transitional Milk
  - Secreted from around day 3 to 2 weeks after delivery.
  - Nutrient composition gradually shifts between that of colostrum and mature milk.

- Mature Milk
  - Appears thin and watery but contains all essential nutrients.
  - Lower in protein compared to colostrum, but provides balanced carbohydrates, fats, vitamins, and minerals necessary for optimal growth.

Colostrum

How to assess whether breast milk is adequate for the baby?

- Baby sleeps for at least 1–2 hours following a feed.
- Baby should pass urine at least 6–8 times / 24 hours.
- Baby should be gaining weight.

2. Based on Gestational Age

- Preterm Milk
  - Adapted for premature infants.

- Contains higher concentrations of calories, fat, protein, immunoglobulins, iron, and sodium.
- Specifically tailored to meet the increased metabolic and developmental needs of preterm babies.

3. Based on Each Feeding Session

Characteristic	Foremilk	Hindmilk
Consistency	Thin & watery	Thicker
Timing	Released at the start of a feed	Released towards the end of a feed
Content	Rich in water, vitamins, minerals, and proteins	Rich in fat
Function	Satisfies the baby's thirst	Satisfies the baby's hunger

Contraindications to Breastfeeding (Infant-related):

Category	Condition	Comment
Infant-related	Galactosemia	Absolute contraindication; infant cannot metabolize galactose.
	Primary Lactose Intolerance	Rare condition where the infant cannot digest lactose in breast milk.
Mother-related (Absolute)	Chemotherapy / Radiotherapy – lactating mother on anticancer (antineoplastic) therapy	Breastfeeding is unsafe due to drug/radiation toxicity.
Mother-related (Relative / Conditional)	Maternal HIV	Contraindicated in developed countries. In developing countries, *exclusive* breastfeeding may be allowed, but mixed feeding is contraindicated.

Category	Condition	Comment
	Active Untreated Tuberculosis	Breastfeeding should be withheld until the mother has received at least 2 weeks of effective anti-TB therapy.
	Varicella-Zoster (Chickenpox / Shingles)	Infant must avoid direct contact with active lesions; infant should receive varicella-zoster immune globulin (VZIG).
	Herpes Simplex Infection	Breastfeeding is contraindicated if herpetic lesions are present on the breast.

FEEDING OF PRETERM NEONATES

Gestational Age	Preferred Initial Feeding Method
< 28 weeks	IV fluids ± Total Parenteral Nutrition (TPN)
28–31 weeks	Orogastric or nasogastric tube feeding
32–34 weeks	Katori-spoon / Paladai / Cup feeding
> 34 weeks	Direct breastfeeding

Breast milk jaundice is of late onset

- By day 4, bilirubin level starts rising- reaches 20 - 30mg / dl by 14 days of age.

Then falls reaching normal by 4 - 12wks of age. (Cause – Inhibitory substances in

Breast milk which interferes with conjugation e.g. Pregnanediol & free fatty acids)

- Stop breast-feeding - bilirubin level falls rapidly in 48hrs
- 70% recurrence in future pregnancies

Breast feeding jaundice:

Breast fed infants have slightly higher level of bilirubin in first 3 - 4 days of life compared to bottle fed infants. Occurs because of excess enterohepatic circulation and relative dehydration. This type of jaundice needs continuation of Breast feeding.

High Yield Points

• Human milk contains 30 times more DHA than cow's milk

• Highest concentration of secretory IgA in any body fluid are found in colostrum

• Breast milk contains adequate amounts of all vitamins except vitamin D, K (& B12 in strictly vegan mothers)

• Colostrum is the 'first immunization' of the baby

• Maximum breast milk output occurs at 5–6 months of lactation Q (~730 mL/day)

• Expressed breast milk can be stored for:

– 8-10 hours Q at room temperature

– 24 hours Q in a refrigerator

– 3 months in a deep freezer at –20°C

• To promote exclusive breastfeeding, the Baby Friendly Hospital Initiative (BFHI) was launched in 1992

• Breastfeeding should be initiated:

– As soon as possibleQ after birth (best answer)

– Within 1 hour of birth (Ghai 9th Ed)

• Exclusive breastfeeding is to be continued for 1st 6 months of lifeQ

• At 6 months, complimentaryQ feeding is starte

•Vertical transmission of HIV can occur before (intrauterine), during (intrapartum), or after delivery (through breastfeeding)

•Breastfeeding is contraindicated in Galactosemia

• Breastfeeding is the least-common route of vertical transmission of HIV in industrialized nations

• Breastfeeding is responsible for as much as 40% of perinatal infections in resource-limited countries.

• Rooting reflex helps a mother in breastfeeding

• World Breastfeeding Week: 1st–7th August

Composition of breast milk

1. Carbohydrate – 7 g/100 ml [Lactose]
2. Fat – 3.5 g/100 ml [Unsaturated Fats]
3. Protein – 1.1 g/100 ml [Rich in Whey Protein]
4. Minerals – Adequate [Ca:P ratio is 2:1 → Ideal; Iron content is low but absorption is better]
5. Vitamins – Adequate, including Vit C & Vit B12 (except in vegan mothers)

- Vitamins deficient in breast milk: Vit K, Vit D, Vit B1
- Breast milk has more lactose but less fat, protein, and calcium than animal milk.
- Breast milk is rich in whey protein (better) compared to casein of animal milk.
- Breast milk also has more taurine and cysteine, methionine.
- Breast milk has more MUFA, PUFA, and is especially rich in DHA (Docosahexaenoic acid) → **Essential for brain & retina development**.

Storage of Expressed Breast Milk (EBM)

- At room temperature: 6–8 hours
- In refrigerator (2-8°C): Up to 24 hours
- In a deep freezer (–20°C): Up to 3 months – breastmilk banks

Breast milk has anti-infective factors like:

- Lysozyme
- Anti-staphylococcal factor
- Immunoglobulins (IgA)
- Bifidus factor & Lactoferrin

- Low levels of para-amino benzoic acid (PABA) → protects against *Malaria*
- Bile-stimulated lipases → act against *Giardia lamblia*, *Entamoeba histolytica*
- Protective action also noted against *E. coli*

• WHO Recommendation Regarding Breastfeeding in HIV-infected mother: Where replacement feeding is readily available & safe, breastfeeding should be avoided. In low-resource countries where other diseases (diarrhea, pneumonia, malnutrition) substantially contribute to a high infant morta-lity rate, the benefit of breastfeeding outweighs the risk for HIV transmission. ART should be initiated urgently in all pregnant and breastfeeding women, even if they are identified late in pregnancy or postpartum, because the most effective way to prevent mother-to-child HIV transmission is to reduce maternal viral load.

Mnemonic

Anti-infective Substances Present in Breast Milk "Teach for": PLAB

1) TGFβ
2) Phagocytic macrophages
3) PABA (Para amino benzoic acid)
4) Lactoferrin
5) Lysozyme
6) Antibodies, especially IgA
7) Anti-staphylococcal factor
8) Bifidus factor

Preterm Breast Milk is Richer in: "SIP for Intelligent CNS"

- Sodium
- Iron
- Protein
- Fat
- Immunoglobulins
- Calories

Complimentary feeding should be 'AFASS'

- Acceptable

- Feasible
- Affordable
- Sustainable
- Safe

Clinical case №1.

A full term baby, exclusively breast fed at the end of 1 week was passing golden yellow stools and was found to have adequate hydration with normal systemic examination. The weight of the baby was just same as it was at birth. The pediatrician should now advice:

a. Give oral solution with breastfeeding

b. Start top feeding

c. Investigate for lactic acidosis

d. Reassure the mother that nothing is abnormal.

Answer Keys for clinical cases.

Answers	**Explanations / Identifying features**
Answer to clinical case№1 d. Reassure the mother that nothing is abnormal.	The key points in the case: • Full-term baby • Exclusively breastfed • 1 week old • Golden-yellow stools (normal for breastfed infants) • Adequate hydration and normal systemic examination • Weight same as at birth (no weight gain, but not weight loss) It is *normal* for newborns to regain their birth weight by the end of 2 weeks. At the end of the first week, some babies may still be at or slightly below birth weight. Since hydration and examination are normal, no intervention is needed

Picture-based question №1. The given picture indicates which of the following?

a. Good positioning

b. Rooting reflex

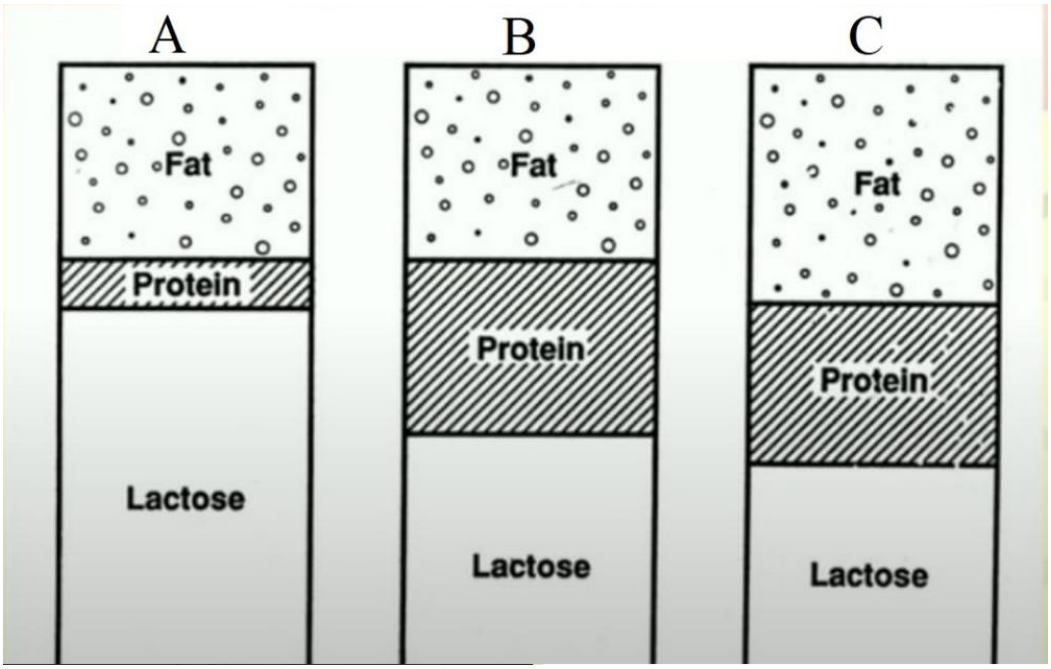
c. Good attachment

d. Weaning

Picture-based question №2. The item shown below is used to feed newborns born at what gestational age?

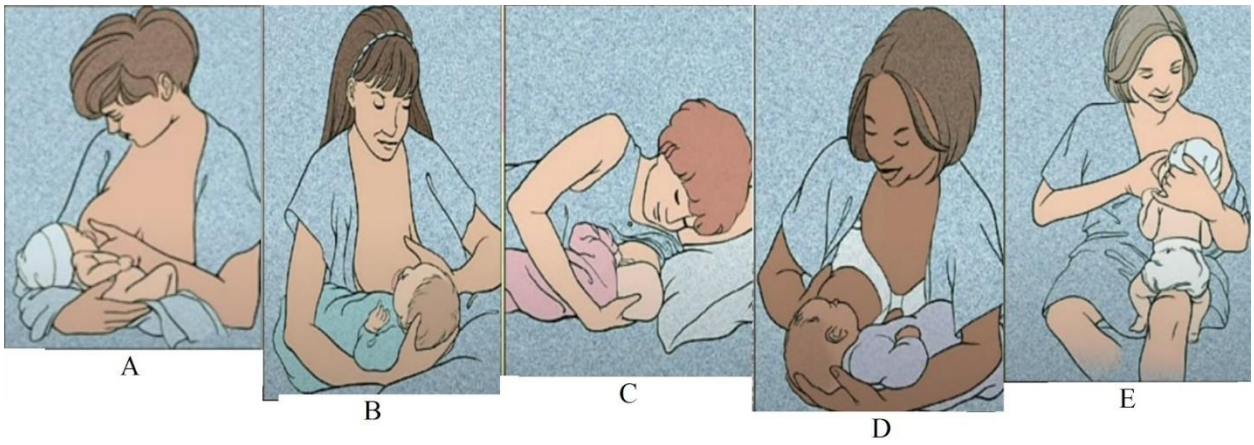
a. 27 weeks b. 30 weeks c. 33 weeks d. 37 weeks

Picture-based question №3. What are the differences between these milks?



a. A-Colostrum, B-Transitional milk, C-Mature milk
b. A-Transitional milk, B-Mature milk, C-Colostrum
c. A-Mature milk, B-Transitional milk, C-Colostrum
d. A-Colostrum, B-Mature milk, C-Transitional milk

Picture-based question №4. Match the breastfeeding positions' name



A	cross cradle hold position
B	Australian/saddle hold position
C	side lying position
D	football hold/ Clutch Hold position
E	cradle hold

Answer Keys for Picture-Based Questions

Answers	Explanations / Identifying features
Answer to Picture-based question №1 c. Good attachment	The newborn shows signs of proper attachment when the mouth is opened widely, most of the areola is inside the mouth, the lower lip is turned outward, and the chin is in contact with the breast.
Answer to Picture-based question №2 c. 33 weeks	The given picture is that of a paladai (Katori spoon), that can be used for feeding neonates born between 32-34 weeks gestation; Initial mode of feeding of a preterm neonate depends on gestational age at which baby is born
Answer to Picture-based question №3 a. A-Colostrum, B-Transitional milk, C-Mature milk	A = Colostrum • Rich in proteins (especially immunoglobulins), relatively less fat and lactose. • Provides immunity and protection in the first few days after birth. B = Transitional Milk • Intermediate composition. • Protein content decreases compared to colostrum, while fat and lactose gradually increase. C = Mature Milk • Higher fat and lactose content, lower protein compared to colostrum.

	• Designed for steady growth and energy needs of the infant.
Answer to Picture-based question №4 A – Cradle Hold B – football hold/ Clutch Hold position C – Side-Lying Position D – cross cradle hold position E - Australian/saddle hold position	A. Cradle Hold • Description: Baby's head rests in the bend of the mother's elbow, with the mother's arm supporting the baby's body. • When to use: Commonly used after the first few weeks, once the baby has learned to latch well. • Advantages: Comfortable for longer feeds; allows bonding through eye contact. • Limitations: May be difficult for newborns who need more head support. B. Football Hold / Clutch Hold • Description: Baby is tucked under the mother's arm (like holding a football), with the body supported along the mother's forearm. • When to use: After C-section (avoids pressure on the abdomen), for twins, or in mothers with large breasts. • Advantages: Excellent visibility of the baby's latch; avoids abdominal pressure.

	• Limitations: May be tiring for the mother's arm if not supported with pillows. C. Side-Lying Position • Description: Mother and baby lie on their sides facing each other, baby's mouth aligned with the breast. • When to use: Nighttime feeds, after C-section, or when the mother is tired. • Advantages: Comfortable for rest while feeding; reduces strain on stitches after cesarean. • Limitations: Requires practice to ensure correct latch and avoid baby slipping. D. Cross-Cradle Hold • Description: Mother supports the baby's head with the hand opposite to the breast being used (e.g., left hand supports baby when feeding from right breast). • When to use: Very useful for newborns and premature babies. • Advantages: Gives mother more control of the baby's head and helps guide attachment.

	• Limitations: Requires use of both hands, so less freedom for the mother. E. Upright / Koala Hold • Description: Baby sits straddled on the mother's thigh or hip, facing the breast in an upright position. • When to use: In babies with reflux, colds, or ear infections; useful for older babies with good neck control. • Advantages: Helps with swallowing, reduces reflux; keeps airways clearer. • Limitations: Less practical for very small or newborn babies who lack head control.

Test №1. Which of the following is a contraindication for breastfeeding?

a. Hep A b. Hep B c. CMV d. Active untreated TB

Test №2. Which of the following is true regarding storage of expressed breast milk?

a. EBM can be stored at room temperature for about 6 hours and 24 hours in refrigerator

b. EBM can be stored at room temperature for about 24 hours and 6 days in refrigerator

c. EBM can be stored at room temperature for about 18 hours and 1 month in refrigerator

d. EBM can be stored at room temperature for about 6 hours and 6 days in refrigerator

Test №3. Which one of the following is a bioactive factor of human milk when compared to formula milk?

a. Lipoprotein A

b. Transforming growth factor

c. Immunoglobulin-M d. Polysaccharides

Test №4. Breastfeeding should begin within … hours after cesarean delivery

a. 2 b. 4 c. 8 d. 24

Test №5. Breast milk storage in a refrigerator is up to:

a. 4 hours b. 8 hours c. 12 hours d. 24 hours

Test №6. Milk is deficient in?

a. Iron and Vit C b. Iron and Vit A

c. Phosphorus and Vit C d. Phosphorus and Vit A

Test №7. Colostrum is rich in

a. IgA b. IgE c. IgG d. IgM

Test №8. Compared with cow's milk, mother's milk has more? M

(Bihar PG 2015)

a. Lactose b. Vitamin D c. Proteins d. Fat

Test №9. Which of the following are true about breast milk?

a. It is a rich source of Iron

b. It contains more carbohydrates than cow's milk

c. It contains more proteins than cow's milk

d. It contains less DHA than cow's milk

Test №10. Nipple confusion means?

a. Baby fed with a bottle finding it difficult and confusing to suckle at breast

b. Baby not able to suckle with bottle

c. Baby not able to feed with spoon

d. Baby not able to feed with paladin

Test №11. The following component of human milk is protective against Giardia lamblia infection?

a. Lysozyme b. Lactoferrin c. Bifidus factor d. Glycoconjugate

Test №12. The average whey/casein ratio in breast milk is:

a. 60:40 b. 80:20 c. 20:80 d. 40:60

Test №13. Which of the following is not a component of Kangaroo mother care (KMC)?

a. Skin to skin contact b. Supplementary nutrition

c. Exclusive breastfeeding d. Early discharge and follow-up

Test №14. Amount of protein present in 100 mL of breast milk is:

a. 2.2 g b. 1.1 g c. 0.55 g d. 3.3 g

Test №15. Compared to breast milk, colostrum is richer in

a. Protein b. Fat c. Lactose d. Water

Test №16. Breast milk at room temperature stored for

a. 4 hours b. 8 hours c. 12 hours d. 24 hours

Test №17. Breastfeeding for a new born to be started

a. As soon as possible b. After 6 hours

c. After 1 day d. After meconium has passed

Test №18. Breast milk is rich in ___ when compared to cow's milk

a. Lactose b. Protein c. Fat d. Vitamin K

Test №19. All are true about breastfeeding except

a. It is available at proper temperature

b. Breast milk contains antibodies

c. Exclusive breastfeeding up to 6 months of age

d. To be started after 4 hours of normal delivery

Test №20. Exclusive breastfeeding is done till:

a. 4 months b. 6 months c. 8 months d. 10 months

Test №21. An infant is breast-fed but his mother is vegan. Which micronutrient supplementation will be needed in this child?

a. Vitamin A b. Vitamin C

c. Vitamin B6 d. Vitamin B12

Test №22. You are counseling a new mother about the importance of breastfeeding. What forms the secretory component of the antibody that is maximally present in breast milk?

a. Plasma cell only

b. Epithelial cells of lining mucosa only

c. Plasma cell and oligosaccharides

d. Oligosaccharides and epithelial cells

Test №23. **What is the amount of milk given to a term baby in first 24 hours after delivery?**

a. 40 ml/kg b. 50 ml/kg c. 60 ml/kg d. 80 ml/kg

Answers to tests with Explanations

Test№1. d. Active untreated TB

Test№2. a. EBM can be stored at room temperature for about 6 hours and 24 hours in refrigerator

Test№3. b. Transforming growth factor

• TGF-β is the most abundant cytokine in human milk; It has 3 isoforms, of which TGF-β2 predominates

• Milk-borne TGF-β regulates inflammation, wound repair & helps prevent allergic diseases.

Test№4. b. 4

Breastfeeding should be initiated within 30 mins. of a normal vaginal delivery & 4 hours of cesarean section.

Test№5. d. 24 hours

Site of Storage / Temperature	Duration
Room temperature	8–10 hours
Refrigerator	24 hours
Freezer at –20 °C	3 months

Test№6. a. Iron and Vit C

About the options:

Nutrient	Key Point
Iron	Iron content is low (≈1 mg/L) in both cow's and breast milk, making it difficult to meet the infant's RDA (8–10 mg). However, breastfed infants absorb iron 2–3 times more efficiently than those fed cow's milk.
Vitamin C	Infants consuming pasteurized or boiled animal milk are at higher risk of Vitamin C deficiency.
Phosphorus	Cow's milk contains high levels of phosphate; this may cause hypocalcemia in infants consuming cow's milk predominantly.
Vitamin A	Both breast milk and cow's milk provide adequate Vitamin A to meet infant requirements.

Test№7. a. IgA

Colostrum contains more antibodies (IgA), WBCs and protein. Also called 'first immunization' of the baby.

Test№8. a. Lactose

Test№9. b. It contains more carbohydrates than cow's milk

Test№10. a. Baby fed with a bottle finding it difficult and confusing to suckle at breast

Test№11. b. Lactoferrin

Discussing about the options one by one:

Component	Protects Against
Lysozyme	*Entamoeba histolytica*

Component	Protects Against
Lactoferrin	*Giardia lamblia, Plasmodium falciparum, Toxoplasma gondii, Entamoeba histolytica, Pneumocystis carinii*
Bifidus factor	*Shigella, Salmonella, Escherichia coli*
Glycoconjugate	*Vibrio cholerae, Escherichia coli*

Test№12. a. 60:40

Human milk contains two types of proteins 60% is: whey and 40% is casein; helps in quick & easy digestion.

Test№13. b. Supplementary nutrition

Components of Kangaroo Mother Care (KMC) are:

Component	Description
Kangaroo Position	Skin-to-skin contact between mother and baby.
Exclusive Breastfeeding	Feeding only breast milk; may be combined with fortification if needed.
Early Discharge & Follow-up	Discharging early from hospital with planned, regular follow-up care.

Test№14. b. 1.1 g

Test№15. a. Protein

Test№16. b. 8 hours

Test№17. a. As soon as possible

Test№18. a. Lactose

Test№19. d. To be started after 4 hours of normal delivery

Test№20. b. 6 months

Test№21. d. Vitamin B12. Vitamin B12 is found only in animal products (meat, eggs, dairy). Strict vegan mothers lack adequate dietary B12 unless they take supplements. Their breast milk will also be deficient in B12, putting the infant at risk. Infant deficiency effects: megaloblastic anemia, developmental delay, neurological impairment. Therefore, breastfed infants of vegan mothers require Vitamin B12 supplementation.

Test№22. b. Epithelial cells of lining mucosa only. Antibody maximally presents in breast milk is immunoglobulin A (IgA). The secretory component of immunoglobulin A is formed by epithelial cell of lining mucosa. IgA occurs in two forms – serum IgA (monomer) and secretory IgA (dimer).

Test№23. c. 60 ml/kg. Daily requirement is based on body weight for a term baby, fluid requirement ≈ 60 ml/kg/day on Day 1. This gradually increases:

Day 2 → 80 ml/kg, Day 3 → 100 ml/kg, Day 4 → 120 ml/kg, Day 5 → 150 ml/kg (maintenance level).

Assessment of student knowledge and control criteria

Forms of current assessment (CA) of practical training in "Neonatology" and “Outpatient polyclinic pediatrics”.

Grade	Appropriation (%) and in points	The student's level of knowledge

Main literature:

Review of Pediatrics & Neonatology 6th EDition 2020

Additional literature:

Comprehensive review series “CRS PAEDIATRICS”Active Recall Based Integrated Edition 2021

Internet sites:

Amboss.com

Lecturio.com

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4. O‘quv, o‘quv-uslubiy qo‘llanmalar, monografiya va uslubiy tavsiyanomalar tasdig‘i.

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Kengash kotibi **G.A.Ismailova**

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