

Feeding of healthy newborn babies

The best milk for a baby is unquestionably breast milk. All health professionals must be equipped with scientific information regarding the superiority of breast milk and must have sound knowledge about the correct technique of breastfeeding in order to promote breastfeeding with conviction and to support breastfeeding mothers with confidence.

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Superiority of human milk

Nutrition: Breast milk contains all the nutrients in the right proportion which are needed for optimum growth and development of the baby during the first six months. It has a high percentage of lactose. Galactose, an important component of galactocerebroside, is essential for brain growth. It also facilitates absorption of calcium. It contains amino acids like taurine and cysteine which are important neurotransmitters. The fats are mostly polyunsaturated fatty acids which are necessary for the myelination of the central nervous system. It contains vitamins, minerals and electrolytes in the right proportion. Breast milk also contains various hormones and growth factors, some of which are necessary for the maturation of the intestinal tract.

Digestion: The proteins of breast milk are mostly lactalbumin and lactoglobulin (more than 60%) that form a soft curd and are easy to digest. The enzyme lipase in the breast milk helps in the digestion of fats.

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Protective factors: Breast milk contains a number of protective factors which include secretory IgA, macrophages, lymphocytes, bifidus factor, unsaturated fatty acids, lactoferrin, lysozyme, complement factors, interferon etc. Breastfed

babies are less likely to develop infections. A breastfed baby is 14.2 times less likely to die due to diarrhea and 3.6 times less likely to die of respiratory infections.

Other benefits for the baby: Breastfeeding protects against allergies, including asthma. It enhances emotional bonding between mother and baby. Studies have demonstrated that breastfed babies have a higher IQ and have less chance of developing hypertension, diabetes mellitus, coronary heart disease, liver disease and even cancer in later life.

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Benefits for the mother

Breastfeeding soon after birth helps in uterine involution thus reduces chances of post partum hemorrhage. It provides 98% protection against pregnancy if the baby is exclusively breastfed during the first four months of life and the mother is amenorrheic.

Breastfeeding is more convenient and time saving. It reduces the risk of breast and ovarian cancer. It improves the figure of the mother by consuming extra fat laid down during third trimester of pregnancy.

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Benefits to the family and society

Breastfeeding saves money and time and conserves energy. The family and society spends less on milk, health care and illness. A nursing mother requires 600 calories extra for maintaining her lactation.

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Anatomy and physiology

In order to successfully impart knowledge on breast feeding, it is necessary to study the relevant anatomy and physiology of the breast to understand how and where milk is produced and the factors which may effect lactation and ejection of milk.

The breast consists of partly glandular tissue and partly supporting tissue and fat. Milk is secreted by the glands and travels through tubules which drain into lactiferous sinuses. The sinuses which store small quantities of milk lie below the areola. They open out on to the nipple through lactiferous ducts. The thin layer of muscle (myoepithelium) surrounds each gland. The contraction of these muscles causes ejection of milk from the glands.

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Milk production and secretion

Milk is produced as a result of the interaction between hormones and reflexes. During pregnancy the glandular tissue is stimulated to produce milk due to various hormonal influences. Two hormones come into play during lactation. They are prolactin and oxytocin which help in production and ejection of milk respectively.

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Prolactin reflex

Prolactin is produced by the anterior pituitary gland and is responsible for milk secretion by the mammary gland cells. The production of this hormone is stimulated when the baby sucks at the breast. When the baby sucks, the nerve endings in the nipple carry messages to the anterior pituitary which in turn releases prolactin. This hormone passes through the blood to the glands in the breast promoting milk secretion.

This cycle from stimulation to secretion is called the prolactin reflex or the "milk secretion reflex". The more the baby sucks at the breast, the greater is the stimulus for milk production. The earlier the baby is put to the breast, the sooner this reflex is initiated. The greater is the demand for milk, larger is the volume of milk produced. It is therefore important for a mother to feed the baby early, frequently and ensure complete emptying of the breasts at each feed.

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Oxytocin reflex

Oxytocin is a hormone produced by the posterior pituitary. It is responsible for contraction of the myoepithelium around the glands leading to ejection of the milk

from the glands into the lacteal sinuses and the lacteal ducts. This hormone is produced in response to stimulation to the nerve endings in the nipple by sucking as well as by the thought, sight or sound of the baby. Since this reflex is affected by the mother's emotions, a relaxed and confident attitude helps this "milk ejection reflex". On the other hand, tension, pain and lack of confidence hinder the milk flow. This stresses the importance of a kind and supportive person, professional health worker or a relative to reassure the mother and help gain confidence so that she can successfully breastfeed.

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Feeding reflexes in the baby

A baby is endowed with certain reflexes that help him breastfeed.

Rooting Reflex. When the mother's nipple touches the baby's cheek, the baby turns in the direction of the nipple, opens his mouth. This is the rooting reflex in response to touch around the mouth.

Sucking Reflex. It is the most essential reflex for successful lactation. A baby reflexly sucks at the nipple and areola placed in his mouth and forms an effective seal creating a negative pressure. The tongue presses the nipple and areola against the palate squeezing the underlying sinuses by compressing and stretching the nipple between the tongue and palate, forms negative pressure thus milking the lactiferous sinuses. Hence, for effective suckling not only the nipple but a part of the areola should also be in the baby's mouth. If the baby sucks only at the nipple, milk is not ejected, baby does not get sufficient milk, sucks more vigorously resulting in sore nipples.

Swallowing reflex. A baby swallows the milk suckled into the mouth. This reflex develops earlier than the suckling reflex, so that a baby who can suck effectively at the breast will always be able to swallow the milk.

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Types of breast milk

The composition of breast milk varies at different stages after birth to suit the needs of the baby. Milk of a mother who has delivered a preterm baby is different from the milk of a mother who has delivered a full term baby.

1. Colostrum is the milk secreted during the first week after delivery. It is yellow, thick and contains more antibodies and white blood cells. Though secreted only in small quantities, it has higher protein content and is most suited for the needs of the baby. It should NEVER be discarded.
2. Transitional milk is the milk secreted during the following two weeks. The immunoglobulin and protein content decreases, while the fat and sugar content increases.
3. Mature milk follows transitional milk. It is thinner and watery but contains all the nutrients essential for optimal growth of the baby.
4. Preterm milk is the breast milk of a mother who delivers prematurely. It contains more proteins, sodium, iron, immunoglobulins and calories that are needed by her preterm baby.
5. Fore milk is the milk secreted at the start of a feed. It is watery and is rich in proteins, sugar, vitamins, minerals and water and satisfies the baby's thirst.
6. Hind milk comes later towards the end of a feed and is richer in fat content and provides more energy and satisfies the baby's hunger. For optimum growth, the baby needs both fore and hind milk. The baby should therefore be allowed to empty one breast before being offered the other breast.

Ensure exclusive Breastfeeding during first 6 months of life. Additional water is not necessary even in summer.

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Successful breastfeeding

Motivation and support to the mother are the most important corner stones for successful breastfeeding. Feeding practices in the first few days influence the mother's breastfeeding performance. Three prerequisite for successful Breastfeeding are a willing and motivated mother; a active and sucking newborn ; a motivator who can bring mother and newborn together (health professional or relative).The following steps must be practiced.

1. Mother should be motivated right from the antenatal period. Her breasts should be examined and she should be informed about the benefits of breast feeding.
2. Every health care facility must have a written breastfeeding policy .One should arrange mother craft classes in the hospitals.
3. At birth a full term normal baby must be put to the breast within half an hour of birth. Babies born by cesarean section should be put to the breast within four hours or earlier after birth.
4. Rooming in: Since feeding is the best stimulus for milk production, babies should be roomed-in with mother and fed on demand till the baby is satisfied. One breast must be emptied out fully before the second is offered, so that the baby receives both foremilk and hind milk.
5. Frequency: Frequent suckling helps to stimulate milk production. It also prevents engorgement of breasts. The baby should be fed whenever hungry. Initially, some babies feed at short intervals of 1 to 2 hours. Later the babies settle into a more fixed routine of feeding every 2 to 3 hours.
6. Prelacteal feeds: No prelacteal feeds should be given to any baby. Water, glucose water, tea, honey etc. satisfies the baby's thirst and hunger. These babies will not suck vigorously at the breast which in turn will adversely influence the milk production. Prelacteal feeds also increase the risk of infection.
7. Bottle feeds: No bottle feed should ever be introduced. It causes nipple confusion and interferes with suckling at the breast. It is also a source of infection.
8. Feeding from both breasts: When the baby releases one breast the other breast is offered. If the baby is still hungry he will feed on the other breast. Alternate breasts should be offered first at each feed. Duration of each feed: The baby should be allowed to feed till satisfied. When the baby is satisfied she releases the nipple.
9. Duration/continuation of breast feeding: A baby should be exclusively breastfed for the first 6 months. Supplementary feeds given to the baby before six months reduces milk production and also leads to infection and poor weight gain in the baby.

10. Cost of lactation: Nursing mother needs only 600 calories extra for maintaining her lactation, which amounts to additional (x 1 ½ times) home-made food and fluids.
11. Cleaning the breasts: There is no need to wash the breasts before or after a feed as frequent washing removes the natural oil from the nipple and predisposes to fissures in the nipple. The mother should wash her breasts during her daily bath.
12. Complementary feeds: A baby should be given additional food after 6 months. Breastfeeding may be continued for one to two years.

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Positioning and latching

Positioning: Both mother and baby should be in comfortable position for proper breastfeeding. Mother can feed either in lying down or in sitting position. Baby should be supported so that the head, neck and back are in the same plane. The entire baby should face the mother. The baby will have easy access to the breast if the baby's abdomen touches the mother's abdomen.

Latching: After proper positioning the baby's cheek is touched (rooting reflex), the baby will open the mouth. The baby is then quickly brought on the breast, so that the nipple and most of the areola is within the baby's mouth. As the baby is well positioned, the mother will feel no pain while feeding.

Correct positioning and attachment will prevent sore nipples and breast congestion.

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Signs of good attachment

Four signs of good attachment are: Baby's mouth wide open; Lower lip turned outwards; Baby's chin touches mother's breast; Majority of areola inside baby's mouth.

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Problems in breast feeding

Inverted nipples: Flat or short nipples which protract well (become prominent or pull out easily) do not cause difficulty in breast feeding.

Inverted or retracted nipples make attachment to the breast difficult. They should be diagnosed in the antenatal period. These mothers need additional support to feed their babies.

Treatment is started after birth of the baby. Nipple is manually stretched and rolled out several times a day. A plastic syringe is used to draw out the nipple and the baby is then put to the breast.

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Sore nipple

A sore nipple is caused by incorrect attachment of the baby to the breast. A baby who sucks only at the nipple does not get enough milk, so he sucks more vigorously, resulting in a sore nipple. Frequent washing with soap and water and pulling the baby off the breast while he is still sucking may also result in sore nipple. Candidal infection of the nipple is the cause for sore nipple after the first few weeks.

Treatment consists of correct positioning and latching of the baby to the breast. Hind milk should be applied to the nipple after a feed and the nipples should be exposed to air and allowed to heal in between feeds.

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Breast engorgement

The milk production increases during the second and third day after delivery. If feeding is delayed or infrequent or the baby is not well positioned at the breast, the milk accumulates in the alveoli. As milk production increases, the amount of milk in the breast exceeds the capacity of the alveoli to store it comfortably. Such a breast becomes swollen, hard, warm and painful and is termed as an engorged breast.

Treatment: Breast engorgement can be prevented by early and frequent feeds and correct attachment of the baby to the breast. Treatment consists of applying

warm packs locally and giving analgesics to the mother to relieve the pain. Milk should be gently expressed to soften the breast and then the mother must be helped to correctly latch the baby to the breast.

Breast abscess

If a congested engorged breast, an infected cracked nipple, a blocked duct or mastitis are not treated in the early stages, then an infected breast segment may form a breast abscess. The mother may also have high grade fever and a raised leukocyte count.

Treatment: Mother must be treated with analgesics and antibiotics. The abscess must be incised and drained. Breastfeeding must be continued from the normal breast. Start Breastfeeding on affected breast as soon as possible.

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Not enough milk

Many mothers complain that they do not have enough milk. Reassurance is needed if baby is gaining weight and passing adequate amount of urine. Common causes of 'not enough milk' include- not breastfeeding often enough, too short or hurried breastfeeds, poor suckling position, poor oxytocin reflex, breast engorgement or mastitis.

Management consists of counseling the mother to put baby to breast frequently, making sure the baby is attached well to breast and building mother's confidence. Metoclopramide may help in increasing milk production.

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Expressed breast milk

If a mother is not in a position to feed her baby (e.g. ill mother, preterm baby, working mother etc.), she should express her milk in a clean, wide mouthed container and this milk should be fed to her baby. Expressed breast milk can be

stored at room temperature for 10 hours, in a refrigerator for 24 hours and in a freezer at -20°C for 3 months.

Method of milk expression: The woman should lean forward, supporting the breast over the cup or bowl. With thumb above and first finger below the nipple at the areola the breast should be pressed in towards the ribcage. Then the thumb and finger should be brought together, producing squeezing movements behind the nipple. The breast should be released and the procedure repeated till milk starts to drip or flow. The areola should be pressed to the left and right of the nipple in the same way, to make sure that milk is expressed from all sectors of the breast.

Non-human milk

Use of milk other than from the mother should be avoided as far as possible in the first 6 months. If, for some reason a mother cannot feed her baby, other milk may be used.

Animal milk: If an animal milk is fed to babies it need not be diluted. When buffalo milk is used, the cream should be removed to lower the fat content. These babies require additional water and vitamins. Babies fed on animal milk are prone to develop anemia and tetany and have increased risk of developing gastrointestinal and respiratory infections.

Formula milk: Formula milk is an animal milk modified to resemble breast milk. It does not however contain any protective substances, specific amino acids like taurine and cysteine and sufficient quantities of essential fatty acids. Babies fed on formula feeds are more prone to infections and since milk is more expensive, greater chances of dilution resulting in malnutrition in these babies. Therefore this milk is not recommended.

Method of feeding: Bottle feeds are not recommended as they cause nipple confusion and increase the risk of infection.

Spoon feeds: Hands must be washed thoroughly. A measured quantity of expressed breast milk is taken into a sterile katori or cup. Mother/nurse positions the baby in the lap, head held up with left hand or left knee (if mother sits on the

floor). Milk is taken in a sterile spoon and spoon is touched to angle of baby's mouth. When the baby opens the mouth, milk is slowly poured into the mouth. Give the baby time to swallow, before next spoonful is offered. After feeding burp the baby and nurse sideways.

Adequate weight gain and urine frequency 5-6 times a day are reliable signs of enough milk intake.

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Ten steps to successful breastfeeding

Every facility providing maternity services and care for newborn infants should:

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within half-hour of normal delivery.
5. Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breast milk, unless medically indicated.
7. Practice rooming-in. It allows mothers and infants to remain together for 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

Feeding of LBW babies

The low birth weight and preterm babies require higher calories and proteins. Milk of a mother who has delivered prematurely has higher protein content and fulfills the requirements of her preterm baby. The higher level of immunoglobulins protects the baby from infections.

Method of feeding: Babies of over 34 weeks of gestation can be breastfed. Babies between 32-34 weeks should be spoon-fed. All babies irrespective of gestation should be put to the breast for non-nutritive suckling. For details Of feeding a LBW baby refer to the topic on management of a LBW baby.

For further reading

- (1) Training manual on Breastfeeding Management -Steps towards Baby- Friendly Care. UNICEF, Bombay, 1993.
- (2) UNICEF/WHO (1993). Breastfeeding Management and Promotion in a Baby-Friendly Hospital.
- (3) UNICEF (1993). Guidelines for conducting Lactation Management Training Courses for health care providers in hospitals.