

Expressing and Storage of Human Milk



Objectives

At the completion of this unit the participants will be able to:

- ***Teach*** mothers how to establish and maintain a milk supply when they cannot feed the infant at the breast
- ***Demonstrate*** how to hand express milk
- ***Describe*** a protocol for expressing and storing human milk
- ***Demonstrate*** at least one technique, other than bottle feeding, for feeding infants expressed human milk
- ***Describe*** the hierarchy of feeding choices for infants

I. Decision Making for Feeding Choices: A Hierarchy

- **Human milk directly from the breast is the optimal feeding choice**
- **Breastfed infants should not be given formula or human milk substitutes unless medically indicated**
- **In the absence of breastfeeding at the breast, expression of the mother's milk for her own infant is the next best choice**
- **When expressed human milk is unavailable and breastfeeding is impossible, banked donor milk from a Human Milk Banking Association of North America, Inc. member milk bank is preferable to formulas**

II. Reasons for Expressing Milk

- **To establish and maintain an adequate milk supply when the mother and baby are separated due to hospitalization/serious illness of either the mother or the infant. Pre-maturity is the most common reason for wanting to establish and maintain a supply through expression**
- **To maintain a milk supply and provide human milk as feedings when the mother returns to employment outside the home and the infant is in daycare.**
- **To provide expressed milk for an occasional relief bottle or occasional feeding by a person other than the mother**

III. Methods of Expression

- **Relaxation and Massage Techniques**
 - Mothers should be instructed to use all sensory means to foster relaxation and effective let-down
 - Breast massage should be taught to facilitate flow of milk: the tips of the fingers should move around the breast in small circular motions, starting from the outer edge of the breast and working in toward the nipple to move milk forward into the milk collecting sinues

All Mothers Should Be Taught Manual Expression

- **Manual expression is a vital back-up when there is no power or when a pump malfunctions**

All Mothers Should Be Taught Manual Expression

Step-by-Step Manual Expression

- Wash your hands and do breast massage
- Place your thumb and forefinger on the areola or about 1-1.5" away from the nipple
- Push back toward your chest
- While pushing back against your rib cage, press your thumb and forefinger together gently
- Repeat this action
- Keep your thumb and forefinger in the same place until no more drops of milk come out. Then move to another place around the nipple and repeat
- When the milk comes out in only an occasional drop, it is time to stop and massage and express from the other breast

Mothers may adapt the above technique

Hand Pumps

- Hand pumps which operate by using a rubber bulb to create suction are not recommended
- Hand pumps are suitable for use by mothers with a well established milk supply for occasional expression of a relief bottle
- All hand pumps are not equal in performance

Electric Pumps

- **Battery pumps and small electric pumps which are not fully automatic of which cycle infrequently are intended for occasional use by mothers with health nursing babies and are not suitable for establishing and maintaining a milk supply because of inadequate nipple stimulation.**

Electric Pumps

- **Manufacturer's instructions should be read with care to determine the use for which a particular pump is intended**
- **Hospital grade pumps with dual collecting kits are recommended for all mothers who must establish and maintain a milk supply while their infants are hospitalized**
- **For employed mothers, dual collecting kits are necessary time savers. Pumps should be efficient and many mothers prefer lightweight pumps to transport**

IV. Establishing & Maintaining a Milk Supply when Mothers Cannot Breastfeed (the ill infant)

- **Initiation of Expression**
 - Initiation of expression with a hospital grade pump should be implemented as soon as the mother has recovered sufficiently to begin pumping, preferably within 6-12 hrs of birth
 - Early milk volumes are negatively related to the delay between delivery and the initiation of milk expression

IV. Establishing & Maintaining a Milk Supply when Mothers Cannot Breastfeed (the ill infant)

- **Frequency and duration of expression**
 - Frequency of pumping sessions should imitate what a healthy newborn would be doing at the breast; the interval between pumping sessions should not exceed three hours
 - Volume changes after the first two weeks of milk production are correlated with the absolute frequency and the duration of pump use
 - Just as increased frequency of breastfeeding promotes an increase in milk supply, increasing the frequency of pumping sessions is more effective at increasing milk supply than increasing the duration of each episode of pumping.

IV. Establishing & Maintaining a Milk Supply when Mothers Cannot Breastfeed (the ill infant)

- **Frequency and duration of expression** (con't)
 - Early optimal milk production is associated with 5 or more milk expressions in a 24 hr period and pumping durations that collectively exceed 100 minutes/day
 - To stimulate an increase in supply, the optimal pumping frequency should be a minimum of 8 pumping sessions per day should be recommended with a duration of 15-20 minutes (120 min/day) per session when a double collecting kit is used. Pumping both breasts simultaneously produces higher prolactin levels and greater total milk volume than separately pumping each breast

IV. Establishing & Maintaining a Milk Supply when Mothers Cannot Breastfeed (the ill infant)

- **Facilitate a Let-Down**
 - Some women may have difficulty letting down to an impersonal machine. Relaxation techniques, breast massage and visual imagery described above are valuable in facilitating a let-down. A randomized study using a relaxation and visual imagery tape increased volume between 63% and 121%

V. Maintaining Lactation When Mothers and Healthy Infants are Separated on a Regular Basis

- **Mothers of healthy term infants who must return to work outside the home have the advantage of**
 - a.) being able to nurse their infants and
 - b.) already having a well established milk supply.

V. Maintaining Lactation When Mothers and Healthy Infants are Separated on a Regular Basis

A. Exclusive breastfeeding when the mother is with the infant

- The best way to maintain a supply is for the mother to nurse the baby as frequently as possible when she is with the baby and not to feed bottles or solids herself
- Some mothers find reverse cycle nursing extremely helpful. The mother sleeps in the same bed with her infant at night. This frequent night nursing helps to maintain high prolactin levels. Infants are very full when they are sent to day care the next day, and mothers do not need to express as much milk for daytime feedings

V. Maintaining Lactation When Mothers and Healthy Infants are Separated on a Regular Basis

B. Feeding Options/Scheduling Options

- **When returning to work mothers have the following options for feeding their infants:**
 - Continuing to breastfeed as the infant needs by having the infant brought to the worksite
 - Feeding exclusively with expressed human milk
 - Supplementing expressed human milk with formula
 - Opting not to express and feeding formula exclusively while separated
 - Weaning the baby completely

V. Maintaining Lactation When Mothers and Healthy Infants are Separated on a Regular Basis

B. Feeding Options/Scheduling Options

- **Before returning to work, mothers should try and stimulate the work schedule and try and synchronize their pumping schedules with work breaks at least two weeks prior to returning to work**
- **Mothers returning to work should try to work out flexible schedules so that they will be able to take “expression breaks”. Moms should return to work mid-week rather than on a Monday.**

VI. Breastfeeding Management When the Mother is ill

Establishing and Maintaining a Supply

- **Families and health care providers should know in advance of the birth what the mother's wishes are in relation to breastfeeding**
- **If a mother has indicated a desire to breastfeed but is unable to initiate breastfeeding because of maternal illness, every effort should be made to assist the mother in establishing a milk supply**

VI. Breastfeeding Management When the Mother is ill

Mother Support Systems

- Physical support and back-up as well as emotional support
- Support systems

VI. Breastfeeding Management When the Mother is ill

Assisting the Physically Challenged Mother

- Paralysis, cerebral palsy, etc.
- Support personnel may include sign language translators, physical therapists to assist the mother in working out issues surrounding use of equipment or ways to safely hold an infant, bioengineering specialists to modify equipment for easier use by mothers with handicaps, etc.

VII. Basic Milk Expression

Goals of Milk Expression

- **To provide milk that is clean and safe as possible**
- **To minimize the possibility of contamination of the milk from outside sources by storing it in appropriate containers at appropriate temperatures**

VII. Basic Milk Expression

Hand Washing

- **Reduces the potential for and degree of contamination of expressed milk**
- **Elaborate protocols for breast cleansing are unnecessary; normal hygiene is usually sufficient**

VII. Basic Milk Expression

Cleaning Equipment

- **Each mother should be provided her own personal collecting kit**
- **Collecting kits should be washed with hot soapy water after each use and thoroughly rinsed**
- **Aseptic preparation of kits and storage containers for milk is adequate**

VII. Basic Milk Expression

Storing Expressed Milk

- The milk should be placed in the coldest part of the refrigerator or freezer
- Antibacterial properties of human milk help to prevent bacterial growth during storage at room temperature or under refrigeration
- Package milk in feeding sized portions to minimize waste. Milk that has been partially fed should not be reused at the next feeding

VII. Basic Milk Expression

Storing Expressed Milk

	Healthy Term Infant	Hospitalized Infant
Room temp. (78° F or lower)	4-6 hrs	Never unless continuous feed – change syringe set-up q⁴
Refrigerator	3 days	48 hours
Freezer	Self-defrosting freezer: 3 months; Deep freeze 6-12 months	3 months

VII. Basic Milk Expression

Containers

- **Containers should be hard-sided and self-supporting, with air-tight caps that will provide a good seal, preventing oxidation of components**
- **Containers should be labeled with the infant's name and date of expression. The oldest milk should be used first**

VII. Basic Milk Expression

Containers

- **Plastic bags are an extremely poor choice of milk storage container, particularly for the NICU setting because of excessive loss of fat to the polyethylene material and the added risk of contamination due to difficulty in handling and drawing feedings from the bags. They also are not air tight.**

VII. Feeding Expressed Milk to the Infant

Thawing Milk

- **Frozen milk should never be placed in the microwave to thaw**
- **Thawing may be done rapidly under lukewarm (not hot) running water**
- **Excessive heat should be avoided in the thawing process so that valuable components of the milk will not be destroyed**

VII. Feeding Expressed Milk to the Infant

Warming the Milk

- **Milk may be warmed by placing the container under warm running water**
- **Some hospitals may want to warm milk in a controlled temperature hot air incubator**
- **Too much warming may initiate bacterial growth**
- **Gentle shaking of the milk during the warming is advised to re-suspend the milk fat globules**

VII. Feeding Expressed Milk to the Infant

Feeding Methods

- **For the term newborn, bottles with nipples may create nipple confusion and make it more difficult for the infant to breastfeed directly at the breast**
- **Nipple shapes are common in intensive care nurseries where pacifiers are used to stimulate sucking and digestive enzyme production**

VII. Feeding Expressed Milk to the Infant

Feeding Methods

- **Newborn intensive care units have developed protocols without bottles for feeding hospitalized infants**
- **Physiologically, it is less stressful for the premature infant to feed at the breast than it is for him to be bottle-fed**

VII. Feeding Expressed Milk to the Infant

Feeding Methods

- In the older term infant, cup feeding can be an excellent alternative to bottles, and can be especially helpful for the breastfed baby in day care who refuses to take a bottle
- Cup feeding is baby-controlled, whereas other feeding methods such as syringe, medicine dropper or bottle are controlled by the adult doing the feeding

Acceptable Reasons for Supplementation of Breastfeeding

- **Infants with very low birth weight (<1500 gms) or who are born < 32 weeks GSA**
- **Infants with severe dysmaturity with potentially severe hypoglycemia, or who require therapy for hypoglycemia and who do not improve through increased breastfeeding or by being given breast milk**

Acceptable Reasons for Supplementation of Breastfeeding

- **Infants whose mothers have severe maternal illness**
- **Infants with inborn errors of metabolism (e.g. galactosemia, phenylketonuria, maple syrup urine disease)**
- **Infants with acute water loss, e.g. phototherapy for jaundice, whenever increased breastfeeding or use of expressed breast milk cannot provide adequate hydration**

Acceptable Reasons for Supplementation of Breastfeeding

- **Infants whose mother requires medication which is contraindicated in breastfeeding (e.g. cytotoxic drugs, radioactive drugs, and anti-thyroid drugs other than propylthiouracil)**

When breastfeeding has to be temporarily delayed, interrupted for supplementation, mothers should be helped to establish or maintain lactation, for example through manual expression or pumping, in preparation for the moment when full breastfeeding may begin or resume