Disclosure

- This class will not refer to products, drugs, or devices of a commercial company with which we have a significant relationship.
- We have not accepted a fee from a commercial company for this class.
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- Mannel serves as Executive Director of the Oklahoma Mothers’ Milk Bank, a statewide nonprofit.

How Does It Work?

Milk Production and Expression

- How the breast makes milk
- Indications for expression of milk
- Mechanics of expression
- Milk collection and storage
- Troubleshooting common problems
How the Breast Makes Milk

Mammogenesis

- “Mammae” = Latin term for breasts
- From infant’s cry “mamma” in seeking the breast
- Breast development begins during 4th week of fetal gestation
- Further development during puberty
Mammogenesis in Early Pregnancy

- Estrogen – ductal system
- Progesterone – lobes and alveoli
- Prolactin – nipple growth
- Placental lactogen – areolar growth

Transition of breast from non-secreting organ to secreting organ

Lactogenesis I

- Lactogenesis I = capacity of mammary gland to secrete milk from mid-pregnancy to late pregnancy
- Lactation occurs after 16 weeks of pregnancy
- Lactogenesis I continues until 2-3 days after birth
Colostrum
- Increased protein
- Higher concentration of immunoglobulins
- Overall dose to baby = 1 g/day
- Decreased fat
- Decreased lactose
- Low water/fluid volume

Lactogenesis II
- Onset of copious milk secretion after birth
- Milk volume increases rapidly, then abruptly levels off
- Triggered by a rapid drop of progesterone after delivery of placenta
- Occurs 2-3 days after birth
- Lower protein concentration
- Overall dose to baby = 1 g/day
- Higher fat
  - Most recently made milk (end of feeding)
- Higher lactose
  - Less recently made milk (start of feeding)
- Higher water concentration (>85%)

Transitional-Mature Milk

Milk is a Bioactive Substance

- Immunoglobulins
  - Secretory IgA, IgG, IgM, IgD, IgE
- White blood cells
  - T & B cells, neuts, lymphs, macrophages
- Enzymes - lactase
- Lactoferrin
- Oligosaccharides
- Hormones
Lactogenesis II

- Continued milk production
- What is it dependent on??
  - MILK REMOVAL
  - Reflects infant’s appetite rather than mom’s ability to make milk
  - "supply and demand"

Delayed or Impaired Lactogenesis

- Cesarean birth
- Diabetes, type I
- Obesity
- Polycystic Ovary Syndrome (PCOS)
- Hypertension
- Stress
- Retained Placenta
- Postpartum Hemorrhage
Indications for Expression of Milk

- Delayed initiation of breastfeeding
- Interruption of breastfeeding
- Decreased milk supply
- Relief of engorgement
- Donating to a milk bank

Hand Expression

- Most common form of milk expression
- Is more effective for expressing colostrum
- When mechanical breast pump not available
- Useful for stimulating milk release (MER) before using mechanical pump
- When used after pumping, more effectively drains the breast: "hands-on pumping"
Automatic Electric Pumps

- Double-pumping → ↑ milk collection
- Best for mothers working full-time
- Best for sustaining milk production (NICU moms)
- Faster pumping
- Less chance of injury

Milk Collection

Initiating and sustaining milk production for a preterm/sick infant:
- Double-pump w/ hospital-grade pump
- Initiate pumping w/in 6 hours of delivery
  - Consider starting with hand expression
- Hands-on pumping!
- Pump 8-10 times/day for 10-15 min each
- Practice kangaroo care daily
- Stimulate MER (breast massage, heat,...)
Pumping FAQs from moms

- When do I count the start of a pumping session?
  Pumping time starts from beginning of last session to beginning of next session

- How often do I need to clean/sanitize my pump parts?
  Sanitize pump once per day, rinse well after each use during the day

- Should I take some type of herbal supplement to increase my milk supply?
  There is no evidence to support, some will exclude you as a milk donor
Average Milk Volumes

PP Dy 1: 40 - 120 ml
PP Dy 2: 100 - 200 ml
PP Dy 3: 200 - 400 ml
PP Dy 5 – 10: 500 ml (~ 1oz/brst q 3 hrs)

By 1 month postpartum, most mothers are producing 700-800 ml/day.

ABM Protocol #3: Supplementary Feedings in the Healthy Term Breastfed Neonate 2017

Average Infant Intake

- Day 1: 2-10 ml/fdg
- Day 2: 5-15 ml/fdg
- Day 3: 15-30 ml/fdg
- Day 5: 30-60 ml/fdg

ABM Protocol #3: Supplementary Feedings in the Healthy Term Breastfed Neonate 2017

Low or Decreasing Milk Production

- Insure frequent pumping (8-10x/day)
- Tips to elicit milk release
  - Relaxation tips
  - Breast massage, heat
  - Kangaroo care w/ baby
  - Fatigue, stress, pain, anxiety/depression
  - Rule out maternal medications
  - Insure effective type of pump
  - Hands-on pumping!
Pain with Pumping

- Insure proper flange fit
- Decrease length of pumping sessions
- Decrease vacuum
- Insure vacuum is released or interrupted during pumping sessions
- Rule out infection
Silas Murphy Memorial Tree

Unexpected Death In Utero

Georgia
5/18/13
Caroline Nelson