Newborn Nutrition and Feeding
Introduction to MCH

Recommended Infant Nutrition
- American Academy of Pediatrics (AAP) recommends that infants be breastfed exclusively for the first 6 months of life & that breastfeeding continue for at least 12 months
- If weaned before 12 months, infants should receive iron-fortified infant formula

Cultural Influences on Infant Feeding
- Persons who have immigrated to the U.S. from poorer countries often choose to formula feed
  - Beliefs: more "modern" method; adapting to American culture
- Breastfeeding has declined among Native Americans who have left their reservations for urban areas
- 50 of 120 cultures studied typically do not give colostrum to newborns & begin breastfeeding after the milk has "come in"
- Cultural attitudes regarding modesty & breastfeeding
Cultural Influences on Infant Feeding

- See Box 27-1, p. 714
- Specific beliefs & practices related to the mother’s intake of foods that foster milk production
  - Ex. “Hot” foods are considered best for new mothers
  - Korean mothers who eat seaweed soup & rice
  - Hmong women who believe boiled chicken, rice, & hot water are the only appropriate nourishment during the first postpartum month
- Balance between energy forces, hot and cold, or yin and yang, is integral to the diet of the lactating mother

Breastfeeding Rates

- *Healthy People 2010* goals: (2000 rates)
  - 75% of women will breastfeed at birth (68.4%)
  - 50% will continue for 6 months (31.4%)
  - 25% will breastfeed for 1 year (17.6%)
- Breastfeeding rates have increased across all demographic groups

Most significant increases are among women who have historically been less likely to breastfeed:
- young
- lower income
- African-American
- primiparas
- grade school education or less
- employed full-time outside the home
- residing in the South Atlantic region
- mothers of LBW infants
- enrolled in the WIC program

Characteristics of women most likely to breastfeed:
- White, older than 30 years, college educated, with higher incomes, not employed outside the home or working only part-time
- residents of western states, & not participating in the WIC program
Benefits of Breastfeeding

- Benefits extend into childhood & beyond
- Benefits for the infant include:
  - Breast milk enhances maturation of the gastrointestinal tract & contains immune factors
  - Breastfed infants receive specific antibodies & cell-mediated immunologic factors
  - Breastfeeding reduces the risk of cow's milk allergy & eczema
  - Breastfeeding may decrease the risk of childhood obesity
  - Baby does not overeat; less risk of obesity in childhood

Benefits of Breastfeeding

- Benefits for the infant (continued):
  - Breastfed babies are less likely to die of SIDS
  - Breast milk has a protective effect against childhood lymphoma, leukemia, & insulin-dependent diabetes
  - Breast milk may enhance cognitive development
  - Breastfeeding enhances jaw development, decreasing problems with malocclusions & malalignment of teeth

Maternal Benefits of Breastfeeding

- Decreased risk of breast cancer
- Breastfeeding promotes uterine involution & is associated with a decreased risk of postpartum hemorrhage
- Lactational amenorrhea
- Return to prepregnancy weight more quickly
- Some protection against the development of osteoporosis
- Unique bonding experience & increased maternal role attainment
- Cheaper - no cost for milk & healthier babies save money
Familial & Societal Benefits of Breastfeeding

- Convenience
- Money savings
- Intangible benefits:
  - Increased quality of life
  - Increased mothering behaviors
  - More free time for interaction with family & friends
- Mothers may pump breast milk which can be stored and fed to the baby at a later time

Uniqueness of Human Milk

- Designed specifically for human infants & is nutritionally superior to any alternative
  - Bacteriologically safe & always fresh
- Contains antimicrobial factors that provide some protection against a broad spectrum of bacterial, viral, & protozoan infections
- Immunoglobulin A (IgA) is the major antibody in human milk.
- Anti-inflammatory agents, growth factors, hormones, & enzymes found in human milk contribute to the maturation of the infant’s intestine - See Table 27-2, p.718

Uniqueness of Human Milk

- Dynamic substance whose composition changes to meet the changing nutritional & immunologic needs of the infant
  - Lactogenesis stage I - the breasts prepare for milk production (16th week of pregnancy)
    - Colostrum is rich in immunoglobulins and more concentrated than mature milk
  - Lactogenesis stage II - begins with birth: referred to as "the milk coming in"
    - Colostrum gradually changes to mature milk beginning on day 3 - 5; copious amounts of milk are produced in the beginning
    - Sometimes delayed if influenced by a stressful birth
  - Lactogenesis stage III - mature milk is established
    - As nursing increases, so does the fat content of milk. This leads to weight gain and contentment
Uniqueness of Human Milk

- Composition of mature milk changes during each feeding
  - Fat content increases as the infant nurses
- Milk production gradually increases as the baby grows
- **Growth spurts** (10 days, 3 weeks, 6 weeks, 3 months, & 4-6 months) result in more frequent feedings & increased milk production

Formula Feeding

- Formula feeding may be used to supplement breastfeeding if:
  - The mother's milk supply is inadequate
  - The mother is away
- Infants who are bottle fed gain more weight than breastfed babies in the first 3-6 months of life
- Time-consuming
- Costly

Formula Feeding: Parent Education

- **Readiness for Feeding**
  - Cues include stability of vital signs, presence of bowel sounds, & an active sucking reflex
  - Type of formula is usually determined by the pediatrician
  - Parents are advised to avoid switching formulas unless instructed by the physician
- **Feeding Patterns**
  - Newborns will drink 15-30 ml of formula per feeding during the first 24 hours
  - Newborn infants should be fed at least every 3-4 hours
  - Most newborns need 6-8 feedings in 24 hours
  - Number of feedings decrease as the infant matures
  - By week 3 or 4 a fairly predictable feeding pattern has developed
  - Increases in appetite will occur with growth spurts
Formula Feeding: Parent Education

- Feeding Technique
  - Babies should be held for all feedings, with the infant in a semi-upright position.
  - Bottles should never be propped up with a pillow or other object & left with the infant (may result in choking and decay of the teeth).
  - The bottle should be held so that fluid fills the nipple & no air is allowed to enter the nipple.
  - Parents should watch for cues that the infant is satisfied to avoid over feeding and potential obesity.

- Bottles and Nipples
  - There are various brands & style from which to choose.
  - Wash bottles & nipples in warm, soapy water.
  - Boiling bottles is usually unnecessary.
  - Carefully rinse.

Parent Education: Infant Formulas

- Commercial Formulas
  - Designed to resemble human milk.
  - Should be given to all non-breastfed infants.
    - If too expensive, may be eligible for WIC program.
  - Three forms: powder, concentrate, & ready-to-eat.
    - All are equivalent in nutritional content, but vary in cost.
      - (powder is least expensive, then concentrate).

- Special Formulas
  - For infants who are allergic to cow’s-milk or soy-milk formula.
  - Very expensive.

Parent Education: Infant Formulas

- Evaporated Milk
  - Concentrated & less expensive than commercial formulas.
  - No longer recommended because it does not provide adequate nutrition.

- Unmodified Cow’s Milk
  - Not suited to the nutritional needs of the human infant in the first year of life.
  - Concerns:
    - The excessive amount of calcium, phosphorus, & other minerals it contains.
    - The imbalance of calcium & phosphorus.
    - Its excessive protein content.
    - The poor absorption of the fat it contains.
    - Its low iron concentration.
  - Apt to cause microscopic hemorrhages that lead to gastrointestinal blood loss.
Parent Education

Formula Preparation
- Directions are included with the formula
- Formula must be mixed properly because a newborn’s kidneys are immature
- Attention to cleanliness is important
  - Ready-to-eat formula should be used if sanitary conditions are unsafe
  - Terminal heating or the aseptic method can be used for sterilizing bottles and nipples

Vitamin & Mineral Supplementation
- Commercial iron-fortified formula has all of the nutrients an infant needs for the first months of life
- After 6 months, only 0.25 mg of fluoride daily is required if the local water supply is not fluorinated

Parent Education

Weaning
- Gradually an infant will learn to use a cup
- Bedtime bottle feeding is often the last one to remain
- Weaning too early can result in compensatory nonnutritive sucking
- Weaning should be gradual since the infant has learned to rely on the comfort that sucking provides

Introducing Solid Foods
- Introduction before 4-6 months may result in overfeeding & decreased intake of milk
- The infant’s individual growth pattern should help determine the right time to start solids
- The primary health care provider will advice when to introduce solid foods & the type of foods to serve