Maximizing the Benefits of Human Milk Feeding for the Preterm Infant

To promote the use of human milk and support breastfeeding for the preterm infant, the pediatrician must not only understand the advantages human milk feedings afford the infant but also recognize the challenges these infants pose to ultimate breastfeeding success. Integrating breastfeeding into the neonatal intensive care unit requires clinical skill.

This article summarizes current knowledge of the short- and long-term benefits of human milk feedings for preterm infants and the challenges with respect to providing adequate nutrition. Specific strategies are offered to manage preterm infants' nutrition and growth, both in the hospital and at home. In addition, the infection risks associated with breast milk feeding are discussed.

INITIAL CHALLENGES TO BREASTFEEDING PRETERM INFANTS

Preterm infants are usually separated from their mothers and as a result have delayed initiation of breastfeeding. They generally have inadequate suckling practice and inconsistent procedural approaches to feeding, supplementation, and nursing management. Typically, preterm infants receive bottle feedings and may receive unnecessary supplemental formula. Inconsistencies in fortification and supplementation also may exist.

For the mother of the premature infant, separation from her infant, difficulties
with establishment of milk supply, maintenance of long-term milk supply, infrequent opportunities to actually nurse her baby, and the constraints of travel and visitation make breastfeeding far different from the anticipated experience of nursing a term baby. In general, these mothers are stressed, fatigued, and worried.

The knowledgeable pediatrician, accustomed to supporting both parent and child, can serve as helpful moderator and guide during the transition to breastfeeding for the mothers of preterm infants. Breastfeeding will not happen in the neonatal intensive care unit if these mothers are left to their own devices, unsupported and ill advised.

**BENEFITS OF BREASTFEEDING FOR PRETERM INFANTS**

**Short-Term Benefits**

Substantial scientific evidence now exists documenting the health benefits of breastfeeding for newborns. The high quality of human milk protein and enhanced fat absorption from breast milk are well documented. Improved absorption of lactose and minerals from breast milk as well as enhanced gastric emptying also have been recognized.

Human milk provides an ideal balance of nutrients for term babies. It contains unique species-specific ingredients and factors that promote brain growth and cognition, and enhance intellectual and visual development. The use of human milk is beneficial for preterm infants, despite their intestinal immaturity, varying degree of medical illness, immunocompromised status, and increased nutritional needs. These challenges are discussed below.

The 1997 position statement of the American Academy of Pediatrics recognized that “human milk is the preferred feeding for all infants, including premature and sick newborns with rare exceptions.” Similarly, the American Academy of Pediatrics *Pediatric Nutrition Handbook* notes that “human milk from the preterm infant’s mother is the enteral feeding of choice.”

Human milk feedings protect premature infants against sepsis and necrotizing enterocolitis. Human milk provides host defenses such as functional white
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Blood cells, nutrient and enzyme activity, and bioactive factors. These biologically active substances include peptides, glycoproteins, and other chemicals that are growth promoting for specific cell types.

Trophic factors in human milk promote intestinal maturation, hormonal responses, intestinal growth, and probiotic gut colonization (by nonpathogenic bacterial flora). This is especially important for the immunocompromised preterm infant at higher risk for necrotizing enterocolitis and nosocomial infection.

Necrotizing enterocolitis and cholestasis associated with parenteral nutrition are potential life-threatening complications of prematurity. Approximately 5% to 10% of very low birth weight infants contract necrotizing enterocolitis, with its associated high risk of surgical complication, morbidity, and death. Both exclusive and partial human milk feedings, compared to formula, appear to protect against necrotizing enterocolitis.

Premature infants fed fortified human milk have shorter hospital stays and a lower incidence of sepsis and necrotizing enterocolitis. Specific factors such as immunoglobulin A (IgA), lactoferrin, lysozyme, oligosaccharides, growth factors, and cellular components in human milk may influence host defenses in the premature infant and lower the risk for necrotizing enterocolitis.

Breastfed babies have reduced rates of respiratory illness, diarrhea, and vomiting; moreover, these health benefits are conferred to all economic groups. Several studies have shown economic benefits from breastfeeding, with lower direct and indirect health care costs for otitis media, upper respiratory infection, and gastroenteritis during the first year.

In addition, there are potential economic benefits of human milk feedings for preterm infants. A reduction in the number of cases of necrotizing enterocolitis among human milk-fed preterm infants would produce substantial cost savings for hospital care, length of stay, parents' time and wages, and prevention of premature death. Total savings in the United States alone would be more than $3 billion if only 75% of preterm infants received human milk feedings and their incidence of necrotizing enterocolitis decreased from 7% to 1%.

Long-Term Benefits

Most studies conclude breastfeeding promotes intelligence in infants. Neurodevelopmental outcome and intellectual performance are measurably improved in preterm infants fed human milk. Low birth weight infants show nearly five points improvement in cognitive function compared to formula-fed babies. Preterm infants who are fed human milk have higher IQ scores (by 8 points) measured at both 3 and 8 years of age compared to those who were formula-fed. These studies adjusted for maternal educational level and socioeconomic class, which are other important determinants of cognitive development. In addition, the cognitive developmental benefits of breastfeeding appear to increase with duration of breastfeeding.

Visual acuity is measurably improved in breastfed premature infants, and the incidence and severity of retinopathy of prematurity may be lower among human milk-fed preterm infants. Human milk long chain polyunsaturated fatty acids promote growth and development of cognition and vision. These fatty acids, especially docosahexaenoic acid (DHA) and arachidonic acid (AA), account for a high percentage of fatty acids in the fetal retina and brain, which contribute to early visual system development. Because long chain polyunsaturated fatty acids occur naturally in human milk, and because a number of studies show benefits from their addition to preterm formulas, formulas supplemented with DHA and AA have recently been developed.

The American Academy of Pediatrics policy statement on the use of human milk recognizes other potential long-term health benefits from breastfeeding including lower incidence of otitis media, upper respiratory infection, and infectious diarrhea. In addition, sudden infant death syndrome, Crohn's disease, diabetes, and allergic diseases may be reduced in breastfed infants.

Most mothers are eager to learn of the medical benefits human milk feedings offer their infant. Some who never intended to breastfeed can be convinced to express their milk for a few weeks to offer this liquid gold to their infant. Feeding some human milk is better than feeding no human milk to premature infants, regardless of ultimate breastfeeding success. Some mothers may even change their mind and discover later that they want to attempt breastfeeding.

Maternal Benefits

In addition to discussing the health benefits of human milk feedings for preterm infants, clinicians should inform...
mothers who deliver prematurely that they also benefit from breastfeeding. The numerous documented maternal benefits of lactation and breastfeeding include delayed return of fertility, reduced lifetime blood loss (improved iron status), reduced risk of ovarian cancer, reduced rate of spinal and hip fractures, improved bonding with infants, and improved sense of self-competency.24

One extremely important benefit of breastfeeding is a reduction in premenopausal breast cancer. The increasing number of older primiparous mothers contributes significantly to the rising prematurity rate. Both age and parity place these women at higher risk for breast cancer. Breastfeeding reduces the risk of breast cancer by 4% for each year that a mother breastfeeding, especially those who have very low birth weights (below 1500 g).

The calcium and phosphorus content of human milk, although increased slightly among mothers who deliver prematurely, does not meet the requirements for growth and adequate mineral accretion in preterm infants. Impaired bone mineralization and linear growth may result from the feeding of unfortified human milk to preterm infants.20,27,28

Calcium balance in premature infants fed unfortified human milk is not adequate; this is manifested by low serum phosphorus, high serum calcium, and high serum alkaline phosphatase levels, and slow linear growth. Calcium balance studies in very low birth weight infants fed unfortified human milk show low calcium intake, moderate excretion of calcium, and overall low net calcium retention.28

In contrast, preterm infants fed enriched preterm formulas show normal serum phosphorus, normal calcium, and normal alkaline phosphatase levels, and adequate mineral accretion. Of concern is that the highest alkaline phosphatase levels in human milk-fed preterm infants predict the greatest risk for growth failure in the first 2 years.20

Nutritional content of human milk varies over time, especially protein, energy, and fat content.29 Volume restriction of feedings for preterm infants severely limits the available caloric intake. Infants must be fed 180 cc/kg/d to achieve 120 cal/kg/d, and that intake of breast milk would provide inadequate protein, minerals, and other necessary nutrients.

Protein concentration of human milk declines with duration of lactation. The concentration of human milk protein is 0.7 to 1 g/dL by 2 to 3 months postpartum. As a result, unfortified human milk feedings do not meet needs for protein accretion in very low birth weight preterm infants. Human milk sodium content also changes over time and by 2 to 3 weeks postpartum may not meet the needs for growth in preterm infants.

Volume restriction of feedings, variable composition of mother's milk, and delayed onset of feedings are but a few of the factors posing nutritional limitations in the use of human milk for the preterm infant. Although breast milk is clearly the superior food for these infants, the management of human milk feedings can substantially impact prospects for both short- and long-term growth and development.

Malnutrition during this critical period of development may have potential long-term consequences for neurodevelopment. Moreover, newer data suggest the early nutritional environment may influence the risk for subsequent development of cardiovascular disease, hypertension, and diabetes. Small-for-dates infants are at a higher risk for cardiovascular disease,30 thus early infant nutrition for the most vulnerable preterm infants may be important.

HUMAN MILK FORTIFICATION

Because human milk from mothers who deliver prematurely may be deficient in some nutrients (relative to the premature infant's needs for growth), fortification of human milk feedings typically is required for most preterm infants and for all infants weighing less than 1500 g at birth. Fortification or supplementation of human milk with energy and protein improves rates of weight gain and indices of protein status. In fact, growth rates of very low birth weight infants fed fortified human milk are similar to those of infants fed preterm formula.31

A number of commercial human milk fortifiers are available in the United States. They maximize short- and long-term health benefits while addressing the nutritional limitations of human milk as a sole source of nutrition. The
effect of adding human milk fortifiers to the milk of preterm infants’ mothers is to increase the energy content by 20%, fat by 11%, protein by 50%, carbohydrates by 25%, minerals by 250% to 500%, and sodium by 90%. Calcium balance is markedly improved in premature infants fed fortified human milk, with net calcium retention approaching intrauterine accretion rates. Fortified human milk positively affects protein intake and protein retention in preterm infants. Total serum protein and blood urea nitrogen levels are higher, near normal, in infants fed fortified human milk.

Commercial human milk fortifiers boost weight gain, increase length and head growth, and improve bone mineral content and nitrogen balance. Although many nurses believe fortifiers cause feeding intolerance, controlled clinical trials have not shown fortifiers to be responsible for persistent gastrointestinal intolerance, increased gastric residuals, bilious gastric residuals, abdominal distention, or blood in stools. Human milk fortification increases milk osmolality but does not increase feeding intolerance or necrotizing enterocolitis.

Human milk fortification is started once feeding tolerance has been established with sequential advance in feeding volumes, usually once an infant is feeding 100 cc/kg/d. Fortification may be started earlier depending on the infant's needs. Studies comparing the use of fortified human milk feedings to preterm formula feedings show comparable time to regain birth weight (12 days) and similar rates of weight gain (22 versus 26 g/kg/d). Nearly equivalent length gains and increase in head circumference occur. Reduced fat absorption may occur from fortified human milk, but comparable nutrient accretion of nitrogen, calcium, and phosphorus (relative to intrauterine accretion) were noted when preterm formula-fed infants were compared to fortified human milk-fed infants.

Either powder or liquid fortifiers may be used. For mothers who are unable to express enough milk to meet their infant’s feeding volume requirements, use of a liquid fortifier will stretch their milk supply. Mothers who have adequate supply need not have their milk diluted; a powdered fortifier can be used instead. Fortifiers differ with respect to amount and source of protein, carbohydrate, and fat. The vitamin and mineral content also differ among commercial fortifiers.

**PRACTICAL ISSUES OF FEEDING METHODS**

Two methods by which to tube feed breast milk, continuous milk infusion and bolus (gavage) feedings, have been compared. Energy and nutrient retention and weight gain may be slightly higher as the result of bolus feedings. Gastrointestinal hormone release is faster, which suggests a more physiologic approach to bolus enteral feedings.

Human milk is not homogenized; therefore, the fat separates to the top upon standing and can be lost upon transfer between containers. Less fat loss (and therefore greater calorie delivery) from human milk occurs with bolus feedings. Continuous infusion may waste up to 50% of fat coated in tubing; therefore, the infusion syringe must be tipped upright (close to 90°) to minimize fat loss.

**Trophic Feedings**

Recent data show benefit from early trophic feedings, also known as minimal enteral nutrition or gastrointestinal priming. Lack of enteral nutrition is detrimental to preterm infants. Gut mucosal atrophy, decreased enzyme activity, and impaired gut growth have been reported as a result of delayed enteral nutrition. Significant cholestasis may occur in unfed preterm infants who are maintained on parenteral nutrition. Gut motility and hormonal responses are further decreased in unfed preterm infants. Furthermore, delayed feeding does not prevent necrotizing enterocolitis.

Early enteral feeding induces higher plasma levels of gastrointestinal hormones in premature infants, regardless of respiratory distress syndrome or severity of illness. Increased maturation of gastrointestinal hormone responses is speculated to be the cause. Gastrointestinal priming with low-dose enteral feeding (15 to 20 mL/kg/d) from days 2 or 3 through 9 or 10 results in improved glucose tolerance, increased intestinal lactase activity, decreased intestinal permeability, and improved intestinal motility.

**Nutritional balance studies in preterm infants fed early trophic feeds**

show improved nitrogen and mineral retention. Gastrointestinal priming decreases the time to full enteral feeds, the time to regain birth weight, the duration of parenteral nutrition, the number of days feedings are held for residuals or intolerance, and the duration of hospital stay, without increasing the incidence of necrotizing enterocolitis.

Studies of early nutritional support with trophic feedings (in infants with umbilical catheters in place) show a lower incidence of sepsis and no change in the incidence of necrotizing enterocolitis. Other potential benefits of trophic feedings include lowered incidence of cholestasis and less need for phototherapy.

In addition, the use of trophic feedings for preterm infants emphasizes to mothers the importance of their milk expression. Mothers begin to express milk earlier, and infants fed earlier receive more of their mother's own milk. Moreover, the huge psychological advantage for mothers to know they
are contributing to their infant’s care, something that no clinician can provide, cannot be overestimated.

**Skin-to-Skin Holding**

Certain neonatal intensive care practices encourage successful breastfeeding and growth of preterm infants. Skin-to-skin holding, also known as kangaroo care, beginning as soon as possible or within the first month, is beneficial. The individual neonatal intensive care unit protocol dictates the size of the infant and level of respiratory support at which skin-to-skin holding may be undertaken.

During skin-to-skin holding of preterm infants, issues of temperature regulation, oxygen saturation, control of breathing, and behavioral state are important. Very low birth weight infants maintain higher body temperature and higher oxygen saturation while breastfeeding held skin-to-skin.

Skin-to-skin holding enhances maternal attachment, increases infant alertness, improves weight gain, and hastens hospital discharge. Skin-to-skin holding also has a substantial positive effect on maternal milk volume and promotes maternal confidence about breastfeeding and infant caretaking in general. Mothers who have practiced skin-to-skin holding and non-nutritive sucking are more comfortable and confident with nutritive breastfeeding later.

A theoretical benefit of skin-to-skin holding is the protection of preterm infants from nosocomial infection. An enteromammary pathway exists whereby mucosal or enteric exposure of antigens stimulates maternal production of antibody that is secreted into mothers’ milk. If during skin-to-skin holding mothers are exposed to their infant’s flora or pathogens, they will make specific antibody against those organisms, thereby providing extra protection for their infant and thus lowering the risk of nosocomial infection.

**Use of Hindmilk Feedings**

Occasionally, slow rates of weight gain (less than 15 g/kg/d) occur in very low birth weight infants despite fortification of human milk to 24 cal/oz and feeding volume of 180 cc/kg/d of mother’s milk. The feeding of fortified hindmilk enhances the growth rate in slowly gaining preterm infants. The fat composition of human milk rises linearly throughout the pumping episode.

Foremilk (obtained early in pumping) and hindmilk (obtained late in pumping) differ in energy and fat content, while protein and mineral content are unchanged. Foremilk generally provides 21 cal/oz and hindmilk, 28 cal/oz. Mothers with adequate milk production can be taught to fractionate their milk into foremilk and hindmilk, so that hindmilk can be fed preferentially to enhance growth.

**Vitamin and Mineral Requirements**

The preterm infant’s reserves of water-soluble vitamins are limited. Higher recommended intakes for preterm infants compared to term infants are based on higher protein requirements and reduced vitamin reserves associated with prematurity birth. The recommended intake of water-soluble vitamins for preterm infants fed human milk may be achieved by using a vitamin-containing fortifier or by giving a multivitamin supplement.

Unfortified human milk feedings also do not provide preterm infants the recommended intakes of fat-soluble vitamins A, D, E, and K. Recommended enteral intake of fat-soluble vitamins for very low birth weight infants are 700 to 1500 IU/kg/d of vitamin A, 150 to 400 IU/kg/d of vitamin D, 6 to 12 IU/kg/d of vitamin E, and 5 to 10 μg/kg/d of vitamin K.

Although the main cause of the osteopenia of prematurity is calcium and phosphorous deficiency, vitamin D deficiency also has been implicated. Supplying adequate amounts of both of these minerals and vitamin D is important in the prevention and treatment of this condition. Preterm infants fed fortified human milk with intakes of 400 IU vitamin D have higher bone mineral contents and maintain normal serum vitamin D concentrations. Commercial fortifiers generally provide adequate amounts of fat-soluble vitamins in fully fortified human milk feedings when more than 150 cc/kg/d is given. Fortified human milk probably provides adequate amounts of copper and zinc to meet the needs for growth in preterm infants.

Iron status is highly variable among preterm infants, depending on gestational age, blood loss, postnatal weight gain, and numbers of blood transfusions, as well as erythropoietin use. Although human milk feedings improve iron absorption in preterm infants the currently available commercial fortifiers generally do not provide adequate iron for preterm infants. Additional iron supplements (2 to 4 mg/kg/d of elemental iron...
iron as ferrous sulfate) are required for preterm infants fully feeding fortified human milk. All human milk-fed preterm infants require multivitamin and iron supplementation throughout the first year of life.

**RISK OF INFECTION AND HUMAN MILK COLLECTION**

There is some risk of infection related to human milk feeding. Milk collection is a clean, not sterile, procedure. Mothers must be instructed in the importance of handwashing before pumping. Although expressed human milk may be contaminated with skin flora, pasteurization of a mother’s own milk is not necessary and is undesirable.

Donor milk, however, must be pasteurized using the Holder method of heat treatment. Unpasteurized donor milk cannot be used because of risk of possible transmission of cytomegalovirus, human immunodeficiency virus, or hepatitis C virus.

Mechanical collection systems should be washed after each use and boiled daily. Performance of bacteriologic cultures of a mother’s milk occasionally may be indicated but is not recommended routinely.

There are reports of human milk that has cultured group B streptococcus and *Staphylococcus aureus*. In these rare reports, mothers had clinical mastitis and their infants became sick from the ingestion of infected milk.

Sterile hard plastic bottles or glass bottles should be used for milk storage. Hard plastic caps must be used to close containers. Screw-on nipples do not provide a closed container. Plastic bottle liners are easily contaminated and should not be used.

Storage guidelines for hospitalized infants are more stringent than those for a healthy baby at home. Fresh, refrigerated, or frozen milk may be used, but each has a different safe time within which it must be used. Freshly expressed mother’s milk can be fed to infants immediately; the cellular components are preserved. Refrigerated human milk, stored at 4°C, should be fed to the infant within 48 hours or discarded. Frozen milk may be stored at −20°C in a standard freezer for up to 3 months. Human milk lasts longer (up to 6 months) at −60°C.

Frozen human milk should be thawed slowly in a tepid water bath until it reaches body temperature. Microwave thawing does not preserve the milk’s passive immunity factors and may severely overheat the milk. Thawed milk should be rewarmed for feeding in a warm water bath at 17° to 22°C (room temperature). Human milk fortification is best accomplished at room temperature just prior to administration. Thawed milk left over from a feeding should be discarded.

Whether fresh or frozen milk is used, fortification increases bacterial colony counts as the length of storage increases. Bacterial colony counts in fortified milk are not different after 20 hours of storage but increase slightly after 24 hours.

Based on preliminary reports, some clinicians are fearful of promoting the use of mother’s own milk because of the potential risk of postnatally acquired cytomegalovirus in preterm infants younger than 32 weeks gestation. Cytomegalovirus has been cultured from human milk and may be transferred to an infant via fresh human milk feedings from a cytomegalovirus seropositive mother. The smallest preterm infants (younger than 26 weeks gestation) who acquire cytomegalovirus from their mother’s milk may appear septic, with disseminated cytomegalovirus disease and associated thrombocytopenia.

Because of this risk, some experts advocate cytomegalovirus serologic screening of preterm mothers who wish to breastfeed extremely low birth weight infants. These seropositive mothers can freeze their expressed milk for 3 to 5 days, a procedure that limits cytomegalovirus growth in their milk.

**MONITORING GROWTH AND NUTRITIONAL STATUS**

Weight, length, and head circumference are used to assess growth and nutrition in preterm infants. Other monitors of growth include initial percentage of body weight loss, time to regain birth weight, and average daily weight gain.

Weight gain and nutritional status must be monitored whenever human milk is fed to preterm infants. A weight gain of 15 to 20 g/kg/d is the goal for human milk-fed infants. Head circumference should increase by 0.8 to 1.1 cm/week. Growth curves are invaluable for determining adequate weight gain.

In addition, biochemical indices must be used to assess protein status and to determine adequacy of bone mineraliza-
tion (and to identify metabolic bone disease). Nutritional biochemical assessment should be performed weekly or biweekly and should include assessing electrolyte, blood urea nitrogen, creatinine, calcium, phosphorus, alkaline phosphatase, hemoglobin, and hematocrit levels. Lower blood urea nitrogen levels correlate with lower albumin levels and suggest inadequate protein intake.

Serum albumin, prealbumin, or total protein levels may be obtained at infrequent intervals to assess protein adequacy. Biweekly calcium, phosphorus, and alkaline phosphatase levels should be obtained to assess bone mineral status. High alkaline phosphatase levels suggest metabolic bone disease or osteopenia of prematurity and increased risk for poor linear growth.

As a result of nutritional biochemical and growth assessment, a modification of the feeding plan may be required for the smallest preterm infants. For example, infants not growing adequately on 165 cc/kg/d of fortified human milk may need their feeding volume increased to 180 cc/kg/d. Some advocate pushing the feeding volume as high as 200 cc/kg/d of fortified human milk.

If infants still do not grow well, they may need to be changed to exclusively fortified hindmilk feedings temporarily, or fat additives may be used. Some advocate the use of protein powder supplements. Occasionally, some preterm infants require the addition of preterm formula to the human milk feeding regimen to normalize biochemical indices and provide adequate growth.

In general, the nutritional status of extremely low birth weight infants is suboptimal even at hospital discharge. Infants who are born between the 10th percentile and the 90th percentiles (appropriate for gestational age) often leave the hospital at weights far lower than the 10th percentile (small for gestational age). Their care in the neonatal unit may create, albeit inadvertently, postnatal growth retardation. Feeding these infants fortified human milk is then intended to provide adequate growth and perhaps some catch-up growth. When these infants go home fully breastfed, their protein, calorie, and mineral intake may be limiting factors.

**NUTRITIONAL STATUS AT HOSPITAL DISCHARGE**

Typically, the human milk-fed preterm infant is discharged to receive partial breastfeeding and is given some supplemental bottles. Whether the supplement is fortified mother’s milk or preterm enriched formula depends on the infant’s nutritional status and growth velocity at hospital discharge.

Some experts advocate measuring blood urea nitrogen, albumin, calcium, phosphorus, and alkaline phosphatase levels periodically to determine how long to supplement the human milk-fed preterm infant at home. When blood urea nitrogen level is less than 10 mg/dL; prealbumin less than 10; phosphorus less than 4.5 mEq/L; alkaline phosphatase less than 400 IU/dL; hemoglobin less than 10 g/dL; growth rate less than 15 g/kg/d; length increase less than 1 cm/week; and head growth less than 0.8 to 1.0 cm/week, the preterm infant has nutritional needs that cannot be met with unfortified mother’s milk alone, at any volume of intake. Providing two bottles each day of preterm enriched formula, in addition to human milk, has been suggested for these infants. Alternatively, a human milk fortifier may be added to all bottle feedings of mother’s milk at home.

It is paramount that the clinician monitor and manage the growth and nutritional well-being of preterm infants. Preterm infants who are capable of breastfeeding should not simply be fed all formula. Most preterm babies can be transitioned from a few breastfeeding episodes each day to exclusive breastfeeding slowly over weeks or months, provided their nutritional status and growth are adequate.

**CONCLUSION**

The proven benefits of human milk for preterm infants clearly outweigh the potential risks associated with its use. Encouraging and assisting mothers to provide breast milk for their infants, and eventually to breastfeed, is a complex clinical challenge. Research data support an organized clinical approach to the use and fortification of human milk for the premature infant and monitoring of growth and nutritional status both in the neonatal intensive care unit and well after hospital discharge.

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