Clinical Policy Title: Donor human milk

Clinical Policy Number: 17.04.01

Effective Date: January 1, 2017
Initial Review Date: August 19, 2015
Most Recent Review Date: September 21, 2016
Next Review Date: September 2017

Policy contains:
- Human milk.
- Very low birth weight infants.
- Necrotizing enterocolitis.
- Infant nutrition.

Related policies:

CP# 12.02.05 Lactation specialist/consultant

ABOUT THIS POLICY: Keystone First has developed clinical policies to assist with making coverage determinations. Keystone First’s clinical policies are based on guidelines from established industry sources, such as the Centers for Medicare & Medicaid Services (CMS), state regulatory agencies, the American Medical Association (AMA), medical specialty professional societies, and peer-reviewed professional literature. These clinical policies along with other sources, such as plan benefits and state and federal laws and regulatory requirements, including any state- or plan-specific definition of “medically necessary,” and the specific facts of the particular situation are considered by Keystone First when making coverage determinations. In the event of conflict between this clinical policy and plan benefits and/or state or federal laws and/or regulatory requirements, the plan benefits and/or state and federal laws and/or regulatory requirements shall control. Keystone First’s clinical policies are for informational purposes only and not intended as medical advice or to direct treatment. Physicians and other health care providers are solely responsible for the treatment decisions for their patients. Keystone First’s clinical policies are reflective of evidence-based medicine at the time of review. As medical science evolves, Keystone First will update its clinical policies as necessary. Keystone First’s clinical policies are not guarantees of payment.

Coverage policy

Keystone First considers the use of donor human milk to be clinically proven and, therefore, medically necessary when any of the following criteria are met:

A. Infant at risk for necrotizing enterocolitis (NEC), i.e., fulfills at least one of the following criteria:
   - Very low birth rate (VLBW) equal to or less than 1500g
B. Infant born at or before 28 weeks of gestation, and is under six months old infant suffers from gastrointestinal anomaly, metabolic/digestive disorder, or is recovering from intestinal surgery where digestive needs require additional support.
C. Infant at risk for malabsorption.
D. If mother’s breast milk is contraindicated or otherwise unavailable

Limitations:
All other uses of donor human milk are not medically necessary.

**Alternative covered services:**

Lactation specialists within network.

**Background**

Breastfeeding and human milk are the standard of care for all infant feeding. Exclusive breastfeeding is recommended for the first six months of life as human milk is the ideal form of nutrition for newborn infants. Human milk in comparison to infant formula provides active enzymes that enhance maturation of the infant’s gut and protective qualities against infection related to the immune system. There are many advantages of an infant diet of human milk, including lifelong developmental benefits.

Breastfeeding and mother’s milk are the best option for feeding all infants, as they provide the highest level of benefits. Human milk’s composition changes over time post-delivery to deliver the optimal nutritional mix to the developing infant. However, many of those infants most in need of the optimal nutritional benefits provided by human milk are not able to receive an adequate supply, as 30 percent of mothers of premature infants are unable to produce sufficient quantities of milk for their children. Donor human milk provides an alternative to formula feeding which provides many of the benefits of a mother’s own human milk.

VLBW infants are at increased risk for NEC. This disease results in the necrosis of the digestive system, and 90 percent of incidence of NEC occurs in preterm infants. NEC can require surgery or eventually result in death or multiple comorbidities, and often these infants require lengthy stays in the neonatal intensive care unit (NICU). Human milk has been shown to have protective qualities that benefit those at risk for NEC in comparison to formula-based diets.

However, substantial improvements are needed in the number of infants receiving human milk while in the hospital. One study by the University of Pennsylvania School of Nursing surveyed nurses from 97 NICUs, covering 6997 very low birth weight (VLBW) infants. Of these, 52% were discharged on formula only, 42% on a mix of formula and human milk, and just 6% on human milk (Hallowell, 2016).

There are 20 states in which 22 milk banks are in operation, with another five being developed (Human Milk Banking Association of North America, 2016). Some states, including the highly-populated California, Texas, and New York, have laws regulating screening, collection, and storage of donated human milk (Council of State Governments, 2014).

**Searches**

Keystone First searched PubMed and the databases of:

- UK National Health Services Centre for Reviews and Dissemination.
- Agency for Healthcare Research and Quality’s National Guideline Clearinghouse and other evidence-based practice centers.
- The Centers for Medicare & Medicaid Services (CMS).

We conducted searches on August 9, 2016 using search terms “Donor human milk.” We included:
• **Systematic reviews**, which pool results from multiple studies to achieve larger sample sizes and greater precision of effect estimation than in smaller primary studies. Systematic reviews use predetermined transparent methods to minimize bias, effectively treating the review as a scientific endeavor, and are thus rated highest in evidence-grading hierarchies.

• **Guidelines based on systematic reviews.**

• **Economic analyses**, such as cost-effectiveness, and benefit or utility studies (but not simple cost studies), reporting both costs and outcomes — sometimes referred to as efficiency studies — which also rank near the top of evidence hierarchies.

**Findings**

Human milk delivers numerous nutritional benefits, particularly to infants at risk for NEC. Recommendations by the American Academy of Pediatrics call for exclusive breastfeeding until six months of age, as the use of mother’s or donor milk for all preterm or low birth weight infants reduces the risk of developing NEC (AAP 2012, Steele, 2016).

Knowledge that donor human milk helps reduce infant morbidity and mortality, especially NEC, is not new. A systematic review from 1983 that used four studies initiated at least 20 years prior, found that infants who received donor human milk were three times less likely to develop NEC and four times less likely to have confirmed NEC than infants on formula (McGuire, 2003).

Donor milk is becoming more available to populations who would benefit most. Between 2007 and 2013 in northern California, the number of hospitals that maintained donor human milk banks rose from 27 to 55, meaning 81.3% of premature infants had such access by 2013. Of the 22 hospitals with a clear transition, breast milk feeding rose 10%, and NEC rates declined by 2.6% (Kantorowska, 2016). In a survey of 83 NICUs in Italy treating 4277 VLBW infants, those facilities with a human milk bank had a much greater rate of discharges with exclusive breast feeding than did those with no milk bank (29.6% vs. 16.0%) (Verd, 2015).

After an increase in NEC, one hospital initiated a protocol of enteral feeding (in the absence of hemodynamic problems), trophic feeding of 5-7 days, and 20-30 ml/kg/day of breast or donor milk among 270 VLBW infants. Among the 155 and 115 infants in the “before” and “after” periods, the NEC rate fell from 7.7% to 0.9%, and mortality declined from 17.4% to 7.8%. There was no increase in hospital stays or sepsis (Sanchez, 2016).

The University Of Louisville School Of Medicine reviewed the performance of a medical center that initiated donor human milk. In a cohort of 550 VLBW infants, some were given human milk in fewer than 50% of hospital days vs. greater than 50% of hospital days. The group with more human milk had a lower rate of NEC (3.4% vs. 13.5%) and mortality (1.0% vs. 4.2%) (Chowning, 2016). Another report compared premature infants (<33 weeks gestation) in a Neonatal ICU. The comparison was between 443 infants in a 6.5 year period who consumed only bovine milk products and 199 infants in a later 2.5 year period who consumed only human milk. The percentage of NEC cases beginning after day seven (7) of life fell from 3.4% to 1.0%, or from 15 to 2 cases (Herrmann, 2014).

There are measures other than NEC incidence and mortality to illustrate efficacy of donor human milk. The median among 201 NICU infants born under 1000 grams was much lower in those with donor milk vs. formula-fed for hours of oxygen (24 vs. 63) and hours of mechanical ventilation (60 vs. 192), which researchers interpret as supporting the safety of donor milk (Verd, 2015).
Not all outcomes measures improved after greater use of donor human milk. One meta-analysis of 10 studies showed that an increase in donor human milk use showed a significant increase of any breast feeding at discharge (RR = 1.19), but insignificant rises in exclusive maternal breast feeding (RR = 1.12) or exclusive administration of a mother’s own milk (RR = 1.08) (Williams, 2016).

Several reports have assessed the costs and cost savings from using donor human milk. One study reviewed 46 NICU admissions who received donor human milk. For infants whose mothers provided sufficient breast milk to discharge, the average cost was $27. This figure was far lower than averages of $154 for those whose mothers had an insufficient milk supply during the stay, $281 for those discharged on formula but who received some mother’s milk during the stay, and $590 for those who received no mother’s milk during the stay (Carroll, 2013). Another report found that, among 207 VLBW infants in California, the average surgical and non-surgical NEC costs in NICU were $198,040 and $74,004 greater than those VLBW with no NEC. Average length of NICU length of stay for NEC infants was 3.9 days greater than non-NEC infants (Ganapathy, 2012).

Policy Updates:

A review of the literature produced 14 additional references that have been added to this policy, three (3) of which are included in the Summary of Clinical Evidence section.

Summary of clinical evidence:

<table>
<thead>
<tr>
<th>Citation</th>
<th>Content, Methods, Recommendations</th>
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</thead>
<tbody>
<tr>
<td>Johnson (2015)</td>
<td>Key points:</td>
</tr>
<tr>
<td></td>
<td>• NEC means longer and more costly treatment (higher level of care) NICU for infants</td>
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<tr>
<td></td>
<td>• NEC requiring surgery (rather than solely medical management) results in NICU costs twice as expensive as medically managed NEC.</td>
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<tr>
<td></td>
<td>• Average additional cost of NEC care are $43,818 per infant. Additional costs reflect higher pharmacy, respiratory therapy and laboratory and pathology expenses.</td>
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<td>• Infants on formula-based diet have 3.5 times greater risk of developing NEC.</td>
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<td></td>
<td>• Each ml/kg/day of human milk = $534 of savings in non-NEC related NICU costs.</td>
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<tr>
<td></td>
<td>• Exposure to any amount of formula increases the risk of NEC by at least three times.</td>
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<tr>
<td></td>
<td>• Those with NEC are at risk for other costly comorbidities.</td>
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<tr>
<td>Verd (2015)</td>
<td>Key points:</td>
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<tr>
<td>Impact of human milk diet to nourish VLBWs in NICU</td>
<td>• 201 VLBW infants in NICU (born &lt;1000g), divided into formula fed and human milk fed</td>
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<tr>
<td></td>
<td>• Median oxygen therapy hours lower for human milk fed (24 vs. 63)</td>
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<td></td>
<td>• Median mechanical ventilator hours lower for human milk fed (60 vs. 192)</td>
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<tr>
<td>Cochrane (2014)</td>
<td>Key points:</td>
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<td></td>
<td>• Formula-based diets increased risk of NEC in LBW or preterm infants by 2.77 times.</td>
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<td></td>
<td>• Formula-fed infants have increased weight gain and head circumference growth.</td>
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<td>Bertino (2013)</td>
<td>Key points:</td>
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<td></td>
<td>• Proportion of human milk consumed in NICU is correlated with proportional improved scores in mental/motor/behavior at 18 and 30 months.</td>
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<td></td>
<td>• Enteral feeding of human milk reduces risk of late-onset-sepsis, and bronchopulmonary dysplasia rates have been linked to increased feeding with human milk.</td>
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<tr>
<td></td>
<td>• Human milk feeding is associated with lower rates of metabolic syndrome.</td>
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</table>
Human milk feeding is linked to benefits later in life, such as lower blood pressure, lower low-density lipoprotein (LDL) concentrations and lower risk of insulin resistance.

Main benefit of human milk is the reduction of NEC rates.

### Key points:
- 207 VLBW infants, some with no NEC, some medical NEC, some surgical NEC
- Avg NICU costs for no-NEC group $74,004 for medical NEC/$198,040 for surgical NEC
- Avg. NICU average length of stay for no-NEC infants 3.9 days less than NEC infants

### Key points:
- Human milk in preterm infants results in lower rates of sepsis, NEC, mortality rates, long-term growth failure and developmental disabilities.
- Long-term benefits from human milk include fewer hospital readmissions, improved mental/motor/behavior scores at 18 and 30 months and lower blood pressure/LDL.
- Human milk improves infant feeding tolerance and neurodevelopmental outcomes.
- AAP recommends all preterm infants receive human milk.

### Key points:
- Exclusive human milk diet reduces 50% of NEC and 90% of surgical NEC in comparisons with bovine milk formula-based diets.
- Mixture of human and bovine diet produces an intermediate level of protection from NEC.
- Human milk has largest effect on reduction of NEC of any other intervention.

### Key points:
- Donor human milk in comparison with formula shows lower mortality rates at nine and 18 months.
- Donor milk reduces risk of NEC by about 79% and results in fewer episodes of feeding intolerance and diarrhea.

### Glossary

**Donor human milk** — Milk obtained from a milk bank that has been donated and is screened and pasteurized before distribution.

**Necrotizing enterocolitis** — Intestinal disease affecting premature infants, particularly premature infants who also have higher mortality rate from this disease.

**Very low birth weight** — Any birth weight below 1500 grams, or 3.3 pounds

### References

**Professional society guidelines/other:**


Peer-reviewed references:


**Clinical trials:**

Searched clinicaltrials.gov on August 9, 2016, using term “donor human milk” | Open Studies. 12 studies found, three (3) relevant.


The Hospital for Sick Children. OptiMom Kindergarten Study. Clinicaltrials.gov website. 

University of Texas Southwest Medical Center. Optimizing Individual Nutrition in Preterm Very Low Birthweight Infants. Clinicaltrials.gov website. 

**CMS National Coverage Determinations (NCDs):**

No NCDs identified as of the writing of this policy.

**Local Coverage Determinations (LCDs):**

No LCDs identified as of the writing of this policy.

**Commonly submitted codes**

Below are the most commonly submitted codes for the service(s)/item(s) subject to this policy. This is not an exhaustive list of codes. Providers are expected to consult the appropriate coding manuals and bill accordingly.

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<table>
<thead>
<tr>
<th>HCPCS Code</th>
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<tbody>
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<td>T2101</td>
<td>Human breast milk processing, storage and distribution only</td>
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