HealthFirst

Colostrum and Milk Drops Protocol for Infants in the NICU

A brief presentation aligned with the Florida Perinatal Quality Collaborative (FPQC) SOOTHE Initiative

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Main Objectives:

Define
- Define colostrum or milk drops and explain their role in supporting sick and premature newborns who are initially NPO.

Describe
- Describe how oral colostrum or milk drops support immune protection, gut priming, and developmental care in vulnerable neonates.

Summarize
- Summarize current evidence showing the benefits of smell, taste, and oral immune therapy with human milk in preterm and critically ill infants.

Explain
- Explain how this practice aligns with the Florida Perinatal Quality Collaborative's SOOTHE Initiative and family-centered neonatal care.

Identify
- Identify practical considerations for safely implementing colostrum or milk drops in the NICU for infants unable to feed initially.

What is Colostrum?

Colostrum (Liquid Gold) is the first milk or foremilk produced by the breasts during late pregnancy and the first few days after birth. It is usually thick, yellow to golden in color, produced in small amounts, and rich in proteins and immune factors such as antibodies.

Different Types of Feeding in the NICU

- Colostrum

- The first milk produced in the first few days after childbirth. It is small in volume but rich in protein, antibodies, growth factors, and other protective substances that help support the newborn's immune system and early gut protection.

Different Types of Feeding in the NICU

- Expressed Breast Milk

- Human milk that has been pumped or hand-expressed from the mother and then given to the infant by another method, such as tube feeding, bottle, syringe, or oral care, when direct breastfeeding is not possible.

Different Types of Feeding in the NICU

- Fortified Breast Milk

- Mother’s expressed milk that has been supplemented with added nutrients, usually calories, protein, calcium, phosphorus, vitamins, and minerals, to better meet the growth needs of premature or medically fragile infants.

Different Types of Feeding in the NICU

- Donor Milk

- Pasteurized human milk donated by screened lactating mothers through an approved milk bank. It is often used when the mother's own milk is not available, especially for preterm or high-risk infants.

Different Types of Feeding in the NICU

- Formula

- A manufactured infant feeding product designed to provide nutrition when human milk is unavailable, insufficient, or not medically indicated. In the NICU, special formulas may be used for premature infants or infants with specific nutritional needs.

Why Use Mother's Colostrum or Expressed Breast Milk for Milk Drops?

For milk drops/oral care in the NICU, the goal is not nutrition, it is oropharyngeal immune therapy.

RATIONALE:

- Exposing the infant's oral mucosa to the **mother's own colostrum or milk** ensures the baby can receive immune, anti-inflammatory, and growth-related bioactive factors even while still NPO.
- The main reason to prefer mother's colostrum and expressed breast milk is that they are **biologically tailored to that specific infant and are richest in the immune factors you are trying to deliver.**
- Colostrum is especially concentrated in immunoglobulins, growth factors, and protective substances.
- Evidence summaries on oral therapy with mother's own milk link it with lower sepsis risk, lower inflammatory signaling, and earlier progression toward enteral and oral feeds.
- In one study of extremely preterm infants, oral care with breast milk increased lactoferrin and secretory IgA.

CONTRAINDICATION:

- **Donor milk** is useful for enteral feeding when mother's milk is unavailable, but it is a weaker choice for oral immune therapy.
  - ✓ Pasteurization reduces key immune and bioactive components such as lactoferrin and other protective factors
  - ✓ There are no known studies establishing donor human milk for oral care/OIT the way there are for mother's own milk.
  - ✓ May still be good as a feeding substitute, but not the preferred liquid for milk drops.
- **Fortified breast milk** and **formula** are built for feeding and growth, not mucosal immune therapy.
  - ✓ Fortifiers change the milk's composition to add calories, protein, minerals, and other nutrients for growth support, which makes sense once feeds are advancing.
  - ✓ Formula provides nutrition, but it does not contain the same immune and biologic components as human milk.

Key Message:

- Small milk drops can provide immune, sensory, and neuroprotective benefits even before full feeds begin.
- Use mother's colostrum first because it has the highest concentration of protective immune factors.
- Use mother's expressed breast milk next if colostrum is no longer available.
- Do not use donor milk for milk drops because its bioactive immune benefits are reduced by processing and it is not the studied standard for OIT.
- Do not use fortified milk or formula for milk drops because milk drops are an immune therapy, not a feeding, and those products are intended for enteral nutrition and growth support.

Why This Matters in the NICU:

NPO, intubated, and very preterm infants often miss normal positive oral experiences.

Without oral milk exposure:

- Premature infants are exposed to suctioning, tube placement, taping, and other unpleasant oral stimuli.
- Feeding is often delayed because they are medically fragile, intubated, or NPO.
- This can disrupt normal sensory learning tied to sucking, swallowing, and oral enjoyment.

With colostrum or milk drops:

- Provides a familiar smell and taste during a period when infants cannot feed normally.
- Supports positive oral experiences while full enteral or oral feeds are still developing.
- Offers exposure to human milk bioactive factors at the oral mucosa.

Why colostrum is different

Colostrum is not just “a little milk.” It is an early immune and developmental signal.

Immune support

Rich in immunoglobulins, lactoferrin, cytokines, and growth factors that help protect the newborn.

Mucosal exposure

Direct contact with the buccal and oropharyngeal mucosa may stimulate local immune pathways.

Sensory priming

Smell and taste of mother's milk help preserve normal feeding-related sensory input.

Low-volume intervention

Can be offered in tiny amounts and is not counted as a nutritive oral feed.

What the evidence shows

The literature supports colostrum / milk-drop exposure as a low-cost, low-volume intervention with meaningful upside.

Immune markers	Trials summarized by Johns Hopkins reported higher salivary or urinary IgA and lactoferrin after oral colostrum exposure.
Sepsis / inflammation	Some studies found lower pro-inflammatory markers and lower clinical sepsis rates in extremely premature infants.
Feeding progress	Meta-analysis found smell and taste interventions reduced time to achieve oral feeds in preterm infants.
Hospital course	Practice-change and cohort studies reported shorter length of stay or faster progression to full enteral feeds in some groups.

Bottom line: **Even when feeds are delayed, small oral exposure to mother's milk may help protect immunity, preserve oral enjoyment, and support the path to feeding.**

How this aligns with FPQC SOOTHE

SOOTHE promotes a neuroprotective NICU culture with individualized sensory care and fewer unnecessary stressors.

SOOTHE principle	Application to milk drops / oral colostrum
Neuroprotective care	Adds a positive sensory experience during a highly medicalized NICU course.
Infant cues matter	Drops are paced to physiologic response and stopped if the infant does not tolerate them.
Family partnership	Parents can be taught to participate using mother’s own milk when available.
Developmentally appropriate care	Connects smell, taste, and oral experience before full feeding readiness is present.

Practical takeaway for bedside teams

Simple approach for infants who are premature, intubated, trophic-fed, or NPO.

1. Use mother's colostrum first when available. It has the highest concentration of protective bioactive factors.

2. Provide tiny, non-nutritive oral exposure per unit protocol and infant tolerance. This is oral care / oral immune therapy, not a PO feed.

3. Coordinate with cares and document clearly. Many pathways describe very small volumes such as 0.2 mL and frequent reassessment.

4. If the infant is strictly NPO, follow provider orders and restart consistent milk-drop practice when clinically appropriate.

Take-home point: milk drops give fragile newborns a safer bridge between “nothing by mouth” and later feeding readiness.

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