Significantly more milk
in less time

Because Every Drop Counts™

Symphony®
Preemie+™

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Improving NICU Outcomes with Human Milk

References


Better Health Outcomes

In the NICU the need for the protective benefits of human milk is perhaps more evident than anywhere else. Premature infants need every drop to help them grow and overcome serious morbidities. Consider these important benefits of human milk:

**Colostrum Provides Greater Protection**
- Preterm colostrum is unique. It has higher concentrations of anti-infectives, anti-inflammatories, growth factors and other protective substances than does term colostrum or mature preterm milk.1-10

**Protective Bacteria Are Passed Directly to the Infant**
- Human milk feedings yield a greater concentration of protective bacteria in the infant’s intestinal tract than does commercial formula. In fact, one study showed that protective bacteria from the mother’s gastrointestinal tract “translocate” to her breastmilk where they are passed directly to the infant.11-17

**Higher Suppression of Inflammatory Process in the Intestinal Tract**
- These protective bacteria, along with other human milk substances, help suppress inflammatory processes that originate in the infant’s intestinal tract. Inflammation can act locally and predispose the infant to necrotizing enterocolitis (NEC). Inflammation can also spread to distal organs, increasing the risk of chronic lung disease (CLD), retinopathy of prematurity (ROP) and adverse neurodevelopmental outcome.11-17

**Better Neuro-developmental Outcomes and Reduced Risk of Rehospitalization**
- Higher amounts of human milk over the NICU stay are linked to better neurodevelopmental outcome and a lower risk of rehospitalization in extremely low birth weight (ELBW; < 1000g) infants at 18 and 30 months of corrected age in a dose-response manner.25-27

**Lower Risks of NEC, Late Onset Sepsis, and Enteral Feed Intolerance**
- Other studies suggest that higher amounts of human milk during the early NICU stay lower the risks for NEC, late onset sepsis and enteral feed intolerance in a dose-response manner.21-24, 30, 34

As more research is published, it becomes increasingly clear that every drop of human milk counts.
More Human Milk Translates to Better Health Outcomes and Lower Costs

Higher doses of human milk can help NICU professionals achieve better outcomes for their vulnerable patients. In fact, research shows a clear dose-response effect between dose of human milk and reduction in risk for several disabling morbidities. This reduction in risk potentially translates into lower health care costs.

Reduction in the Risk for Necrotizing Enterocolitis

NEC affects 7% of very low birth weight (VLBW) infants. Sisk et al reported a six fold reduction in the risk of developing NEC for VLBW infants that received ≥ 50% human milk compared to those that received < 50% human milk, over the first 14 days post birth. The protective nature of the high doses of human milk for even this short time period translated into a shorter hospital stay (42 days vs. 54 days). Medically managed NEC increases cost by $73,000. If surgery is required, additional charges total $186,000.20, 21, 28, 31

Reduction in the Risk for Late Onset Sepsis

Late onset sepsis affects 22% of VLBW infants and many have multiple episodes. Each episode increases the cost of NICU care by an average of $9,200 and increases the length of stay by 4 to 7 days. Human milk feedings significantly reduce the risk of late onset sepsis in VLBW infants by as much as 40%, according to one study. This reduced risk may translate into lower health care expenditures.29-31
Research clearly shows that high doses of human milk in the first 14-28 days post-birth are important in reducing the relative risk for costly and disabling morbidities.

**Reduction in the Risk for Enteral Feed Intolerance**

Enteral Feed Intolerance (EFI) compromises growth and exposes the VLBW infant to prolonged total parenteral nutrition (TPN). TPN is associated with multiple complications and increases NICU costs by as much as $500 to $1,000 per day. Full enteral feeds of 150 mL/kg/day occur 5 days earlier and enteral feeds of 100 mL/kg/day occur 4.5 days earlier for VLBW infants that receive ≥ 50% human milk.34

**Reduction in the Risk of Infant Rehospitalization**

Rehospitalization after NICU discharge is a rising concern for U.S. health care institutions. When comparing ELBW infants fed no human milk vs. those fed 110 mL/kg/day, rehospitalization rates before the first birthday were 30.2% vs. 12.7% and rehospitalization rates due to respiratory illness in the first 2 years were 31.7% vs. 16.4%.

For every 10 mL/kg/day increase in breastmilk ingestion during the NICU stay, the likelihood of rehospitalization decreased 5-6%.26, 27
In 2001, Medela introduced the Symphony® breastpump which contained the original 2-Phase Expression® Technology designed to mimic a baby’s natural nursing rhythm.

The Symphony breastpump was designed with the flexibility to be upgraded as new research is released. The program card can simply be exchanged.

Medela’s Standard 2.0 program has shown to be very successful in helping mothers get human milk to their babies. Research shows that NICU mothers found it to be efficient, effective, comfortable and convenient compared to a single phase breastpump.19

While these results are impressive, Medela and Rush University Medical Center (RUMC) believed that they could do even more for mothers of premature infants.

**Meeting the Challenge**

Previously, breastpumps could only simulate the nutritive sucking pattern of a healthy infant during mature lactation, after the milk supply had been established. However in the first few days after birth, the maternal milk supply is limited. During this time, infants suck more irregularly with rapid sucks and longer pauses.

Medela and the Rush University Medical Center (RUMC) team hypothesized that this sucking pattern may be a critical “first step” in establishing an adequate milk volume. Pump-dependent mothers without an infant to suck in this manner do not receive this very different stimulation to the breasts.

This prompted the team to further research this hypothesis through investigation and evaluation of numerous pumping patterns which closely replicated the newborn infant. This research led to a blinded clinical trial.

### Challenge for NICUs and Mothers: Getting Enough Milk

- **Stimulation Phase (phase 1):**
  - fast and light to start milk flowing.

- **Expression Phase (phase 2):**
  - slower with more vacuum to express more milk gently and efficiently.

Getting Enough Milk is a Challenge

Most NICU professionals understand the value of human milk, but also understand that it can be a challenge to get enough. Many mothers are unable to provide an adequate volume of milk especially during the first few weeks post-birth when high doses of milk are most protective against morbidities.
Paula Meier and her team conducted a blinded randomized clinical trial of 105 breastpump dependent mothers of premature infants. All mothers used two separate cards in the Symphony® Breastpump. The first card was used from the time of birth until the onset of lactogenesis II (the milk coming in). Then the research team switched this card with a second card for the remainder of the study.

For one group of mothers, Preemie™ 1.0 was the first program used. Another group of mothers used the Standard 2.0 card first. Both of these groups used the Standard 2.0 program for the second card.

And thanks to this landmark research we now know that Preemie™ 1.0 followed by the Standard 2.0 program can indeed help mothers of premature infants achieve the same amount of milk as the mother of a healthy full term newborn in as little as just six short days.

Blinded Randomized Clinical Study Leads to Groundbreaking Results.

Pioneering research of pumping patterns for mothers of premature infants directed by Paula Meier, RN, DNS, FAAN provided impressive results.
Meier/RUMC Clinical Trial Results Prove That Symphony® Preemie+™ is More Effective and Efficient

*Mothers Produce Significantly More Milk*
Preemie+ helps more mothers make enough milk to feed exclusive human milk at the time of NICU discharge.

Mothers’ milk output with the Preemie+ program card was significantly greater than the Standard 2.0 alone, reaching the same volume as term mothers by day 6 and matching the output levels through the remainder of the 14 day period.33

*More Mothers Attain Target Volumes*
The Preemie+ program card compared to the Standard 2.0 indicates that:

- 71% of mothers achieved 350 mL/day, enough milk volume to feed human milk exclusively to a 2 kg infant at the time of NICU discharge.
- 36% more mothers achieved the milk output target of ≥350 mL/day.
- More than twice the number of mothers achieved milk output target of 500 mL/day compared to the Symphony® Standard 2.0 alone.32
Mothers Produce More Milk in Less Time

Mothers pumped fewer minutes per day and still removed more milk.

Compared to the Standard 2.0, the daily efficiency of milk output per minute was significantly greater with the Preemie™ program card, and allowed mothers in the study, on average, to pump 124 fewer minutes during the first 14 days.

The first days post-birth represent a critical period for the breastpump dependent mother of a premature infant to establish her lactation. Milk volume in the early days of lactation is predictive of milk volume at 6 weeks post birth for the mother. For baby to receive only human milk, a mother needs to produce 350-500 mL/day.32

The Evidence is Overwhelming

The trial showed that the combination of the Preemie™ 1.0 program and the Standard 2.0 program produced significantly more milk in less time compared to the Symphony Standard 2.0 alone:

- By day 4, pumping was 50% more efficient (mL per minutes of milk flow).
- By day 5, mothers achieved 43% more milk output.
- By day 6, mothers achieved as much milk as mothers of exclusively breastfeeding term infants (530 mL).
- By day 7, mothers achieved 67% more milk output.
- By day 10, mothers achieved 71% more milk output.
- By day 14, 36% more mothers achieved the milk output target of ≥ 350 mL/day post birth — a sufficient amount to exclusively feed human milk to their premature infant at NICU discharge.
- More than twice the number of mothers achieved the milk output target of 500 mL/day.
- On average mothers pumped 124 fewer minutes during the first 14 days.

Research shows Preemie™ is more effective and efficient for pump dependent mothers of premature infants.

Medela has combined each of these programs into one easy to use card.
Translating Evidence into Best Practice

Medela has combined both the Preemie™ 1.0 program and the Standard 2.0 program onto one easy to use Preemie™ program card. This allows mothers of premature infants to use one pump to initiate and maintain her milk supply.

Medela is proud to offer and strongly recommends coupling this groundbreaking product with comprehensive education programs. Working closely with RUMC, we have developed best practices and other education materials to help your institution establish your NICU as a leader in human milk feedings.

Educational Programs

Medela is offering multiple education offerings that teach about the research behind human milk including the most recent findings of the Preemie™ card.

These powerful tools will help teach your NICU professionals how to establish and implement best practices to help your facility translate the evidence about pumping and feeding human milk into achieving better outcomes for your patients.

Symphony® Breastpump with the Preemie™ Card

Symphony pumps are now available with the Preemie™ card.

0240110—Symphony Pump with Preemie™ Card
01514—Symphony Rental Pump with Preemie™ Card

Symphony Preemie™

Program cards are available to incorporate with your current Symphonys and update your fleet with this exciting new research.

67227 — Preemie™ Program Card-English
67226 — Preemie™ Program Card-Spanish
27225 — Preemie™ Program Card-French

Talk with your Medela sales representative today to determine which education program or products best suit the needs of your staff.
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References
