Improving Mother’s Own Milk Supply In a Tertiary Care NICU

Batoul Elamin M.D.
Fellow, Neonatal-Perinatal Medicine
Medstar Georgetown University Hospital
At Medstar Georgetown University Hospital NICU we have the ability to offer Processed Donor Breast Milk (PDBM) through HMBANA when a mother does not have enough milk for her baby.

- PDBM can improve tolerance and reduce the incidence of surgical NEC compared to preterm formula but lacks the many beneficial factors present in mother’s milk.

- Cost of PDBM is $5/oz.
We Listened....!
• **Aim:**
  To improve the delivery of maternal breast milk (MBM) available for our NICU babies to 80% by better supporting our breastfeeding mothers.

• **Population:**
  Our project focuses on infants ≤ 34 weeks gestation at birth.

• **Time Frame:**
  We would like to increase the percent MBM feeds in our infants ≤ 34 weeks GA in a time frame August 2014-2015.
Team Members

Team established January 2014:

- Neonatology Attendings (2)
- Neonatology Fellow (1)
- OB/GYN Attending (1)
- Lactation Consultant (2)
- Speech Pathologist (1)
- Neonatology Nurse (2)
- Labor and Delivery Unit Supervisor RN (1)
- Mother Baby Unit Supervisor RN (1)

Held monthly meetings to discuss progress of implemented changes and identify additional obstacles mothers are facing in providing milk/pumping.
Goals

- Make sure mothers are educated prenatally about the importance of breastfeeding
- Increase percentage MBM feeds in premature infants
- Educate nursing staff on counseling mothers
- Use milk supply assessment tool at bedside in NICU
- Counseling mothers of infants transferred from an outside hospital about early pumping and providing a breastfeeding information packet upon transport
- Securing a home pump for mothers of NICU infants by the time of their discharge
Methodology

- Model for Improvement:
  Performing multiple PDSA cycles to evaluate the effects of our tests of change

- *Plan* what outcomes we wanted, worked back, plan the activities required to get those outcomes
- *Do* the tasks and activities we planned
- *Study* the outcome
- The final part of the cycle was to take *Action*, which is based on the results/analysis.
Critical Thinking

IDEA A

IDEA B
Changes Implemented

1. Education of physicians
2. Education of nursing staff
3. Surveying NICU mothers on pump acquisition/cost, breast pumping routines, education on breastfeeding prenatally
4. Securing hospital grade pumps for eligible mothers
5. Outreach to referring NICUs to get mothers to pump early
6. Educational material provided at time of transport
7. Bedside “Coming to Volume” assessment screening tool in NICU/postpartum
8. Weekly discussion of MBM availability and supply issues during morning rounds
My Mommy’s Milk Club
Pumping Log

Mother’s Name ___________________ Baby’s Name ___________________

Congratulations on your new baby! Please fill out this pumping log daily until your baby is 2 weeks old.

GOALS

Stage I (Birth to milk increase, 8-14 days)
- Rent Hospital Grade Pump
- 10-12 pumpings/day (minimum 8)
- Pump both sides at the same time, at least 20 minutes/breast, or until breasts soften and milk stops flowing
  - Massage and heat during pumping
  - Hand expression after
- Expect:
  - Drops for the first few days, but pumping now “puts in your order” for more milk later!
  - Milk volume gradually increases daily over the first 2 weeks to:

Stage II (Maintaining full milk supply: at least 750 – 1050 mL (25 – 32 oz)/baby/day)
- Milk supply controlled by supply and demand by day 8
  - More demand (pumping more) = increased supply
  - 8-12 pumpings/day (minimum 8)
- Pump until breasts have emptied: Average 20 – 30 minutes with or without hand expression afterwards
- Expect: To maintain milk volume

VARIATIONS ON A THEME

- Every time you pump, you tell your body to make more milk or to continue to make milk. It is essential to get enough stimulation each day, especially at the very beginning. You are “putting in an order” to your breasts for more milk later!
- Mothers of premature babies continue to have breast growth for the first month after they deliver. This is more pronounced the more premature your baby.
- The flange size you need for pumping may change over time!
- The size of your breasts will affect the storage capacity you have for your milk once you have reached Stage III (maintaining your milk supply). Smaller breastfed women may not be able to go as long as larger breastfed women between pumps.

WHEN TO ASK FOR HELP

- If you are unsure about the fit of your pump flanges
- If you have very painful or bleeding nipples
- If your milk supply is not increasing each day between days 3-4 and day 14 of your baby’s life
- You are unable to rent a hospital grade pump before you are discharged from the hospital!
- You do not feel as though your breasts are softening after pumping (stages II and III)
- Any time you have questions!

IMPORTANT DETAILS

- Medications: It is very important to tell your NICU nurse or doctor anytime you begin taking a new medication. This includes prescriptions, over the counter medications, vitamins, and anything to increase your milk supply.
- It is essential that you are pumping with a hospital grade pump through stages I and II (delivery – establishing a full milk supply), while you are separated from your baby. Hospital grade pumps are designed for just this purpose!
- Touching your baby can improve your milk supply. Most helpful is Skin-to-Skin, or Kangaroo Care, done by holding your baby against your bare chest. Sometimes, particularly in the first days of life, it is not possible to hold your baby this way. In these cases, your baby will get comfort from your placing your bare hands on the baby’s head and knees. Your baby’s nurse will show you the most comforting way to touch your baby!

Lactation services can be reached at (202) 444-6455 (202-444-MILK)

<table>
<thead>
<tr>
<th></th>
<th>Mother’s Name</th>
<th>Baby’s Name</th>
</tr>
</thead>
</table>

**DAY 1**

<table>
<thead>
<tr>
<th>Total Pumping Time</th>
<th>Hand expressed after pumping Y/N</th>
<th>oz OR ML pumped LEFT breast</th>
<th>oz OR ML pumped RIGHT breast</th>
<th>Total Amount of Milk Produced (oz OR mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Amount Produced in 24 hours (expected amount: drops)

Minutes Spent Today in Skin-to-Skin Contact with your Baby:

<table>
<thead>
<tr>
<th></th>
<th>Flange size used (in mm)</th>
<th>Left breast</th>
<th>Right Breast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
<td></td>
<td>25</td>
<td>36</td>
</tr>
<tr>
<td>Father</td>
<td></td>
<td>25</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>50</td>
<td>72</td>
</tr>
</tbody>
</table>

Questions, Comments, Concerns:

**DAY 2**

<table>
<thead>
<tr>
<th>Total Pumping Time</th>
<th>Hand expressed after pumping Y/N</th>
<th>oz OR ML pumped LEFT breast</th>
<th>oz OR ML pumped RIGHT breast</th>
<th>Total Amount of Milk Produced (oz OR mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Amount Produced in 24 hours (expected amount: drops)

Minutes Spent Today in Skin-to-Skin Contact with your Baby:

<table>
<thead>
<tr>
<th></th>
<th>Flange size used (in mm)</th>
<th>Left breast</th>
<th>Right Breast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
<td></td>
<td>23</td>
<td>36</td>
</tr>
<tr>
<td>Father</td>
<td></td>
<td>25</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>48</td>
<td>72</td>
</tr>
</tbody>
</table>

Questions, Comments, Concerns:
<table>
<thead>
<tr>
<th>Coming to Volume Assessment</th>
<th>Coming to Volume Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother’s Name</strong></td>
<td><strong>Mother’s Name</strong></td>
</tr>
<tr>
<td><strong>Infant’s Name</strong></td>
<td><strong>Infant’s Name</strong></td>
</tr>
<tr>
<td><strong>Mother’s Age</strong></td>
<td><strong>Mother’s Age</strong></td>
</tr>
</tbody>
</table>

### Date and Location of Assessment (NICU, phone, etc)

<table>
<thead>
<tr>
<th>Day</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Volume recorded in the last 24 hours

<table>
<thead>
<tr>
<th>Day</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Daily volume is:

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase</td>
<td>Increase</td>
<td>Increase</td>
<td>Increase</td>
<td>Increase</td>
<td>Increase</td>
<td>Increase</td>
</tr>
</tbody>
</table>

### Number of pumpings in the last 24 hours (less than 8)

<table>
<thead>
<tr>
<th>Day</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Longest interval between pumpings in the last 24 hours (more than 4 hrs)

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Do mother’s breasts feel full between pumpings?

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Do all areas of both breasts empty completely with pumping?

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Are both nipples free of pain, lacerations and bleeding?

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Are all medications and does the same as previous day?

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Assessment completed by ( initials )

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Unable to reach mother

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attempted</td>
<td>Attempted</td>
<td>Attempted</td>
<td>Attempted</td>
<td>Attempted</td>
<td>Attempted</td>
<td>Attempted</td>
</tr>
</tbody>
</table>

### Lactation contacted ( initials )

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
<th>Day 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Answers requiring a lactation consult are indicated in the first column. Please contact lactation at x64554.

If answer to question 9 is NO please verify safety of new medications with the infant’s physician.

*** If a mother’s supply is LESS THAN 750 ml by day 14 please contact lactation at x64554.
Lactation in the NICU: The Basics

Objectives

1. Explain ways a breastfeeding mother can establish and maintain their milk supply.
2. Discuss best practices to maintain and store expressed breast milk.
3. Discuss the differences between colostrum, term and preterm breast milk, and donor breast milk.
4. Discuss and demonstrate different breastfeeding techniques.
5. Explain the causes and treatments for low milk supply.
6. Recall how a mother’s diet affects milk composition.
Timeline of Implemented Changes

- Securing electric pumps for eligible mothers ➔ January 2014 (1)
- Physician education ➔ April 2014 (2)
- Pumping SLP ➔ May 2014 (3)
- Roll out of Coming To Volume Assessment and Pumping Logs ➔ August 2014 (4)
- Mandatory Lactation Classes ➔ September and October 2014 (5)
Measures

- Percentage of MBM feeds as indicated on the infant’s daily bedside flow sheet
- We will determine the number of mothers who started pumping ≤ 24 hrs of delivery
- Determine the cost to mothers of purchasing/renting pumps, which type of pump they were able to attain and which supplies are not covered by insurance
- Number of mothers who were sent home with hospital grade pumps
- Continue to survey mothers and staff as we implement changes to look for balancing measures:
  - Are mothers feeling supported or pressured in their efforts to provide milk for their infant
  - Are staff feeling overwhelmed with additional bedside duties
Maternal Breast Milk Use

Labelled arrows indicate timing of numbered interventions.

- Oral colostrum care
- First feed MBM
- Full feeds MBM
- Discharge feed MBM

Percentage Infants on MBM by Feeding Stage

Oct-Dec 13 | Jan-Mar 14 | Apr-Jun 14 | Jul-Sept 14 | Oct-14
91 infants were included (October 2013 - October 2014).
Mean GA 30 weeks ± 2.9 weeks with a mean birth weight 1477 g ± 543 g.
The largest improvement in MBM occurred after NICU nursing education!
Institution of the Coming to Volume assessment tool screening for marginal MBM supply and prompting lactation consult increased MBM at full feeds by 36%.

22 mothers returned the survey
Mean GA at delivery 31 weeks ± 5.8 weeks
86% of mothers started to pump at ≤ 24 hrs after delivery
12% met with lactation at ≤ 24 hrs after delivery
At the time of discharge 91% had a rented pump from GUH
A woman burns up to 500 extra calories a day by breast-feeding her baby.
Conclusion

This multidisciplinary team approach and collaboration is necessary:
- Identify issues that need to be addressed
- Effect a noticeable change in NICU breastfeeding practices
- When parents hear a unified message then culture change is easier

Education, in particular nursing education, had a noticeable effect in improving availability of MBM to preterm infants.

We have much work ahead!!!
- Continue to assess impact of implemented changes in stages
- Ensure continued buy-in by involving bedside staff on daily rounds
- Sustain changes

Through ongoing efforts we hope to continue addressing and identifying barriers to improving MBM availability and further improve preterm outcomes.
BREASTFEEDING
It Rocks!
Thank you