Improving Lactation Rates in the ELBW Infant
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Objectives
Following this session, the learner will be able to:
• Identify 3 barriers specific to the ELBW population in initiating and sustaining lactation
• Discuss 2 strategies shown to be successful in increasing breastfeeding availability at discharge in the ELBW population

Disclosures
• Crystal Deming has nothing to disclose.
• Caroline Steele has served on speakers’ bureaus for Mead Johnson Nutrition and Abbott Nutrition.

Why Breastfeed?
Benefits of Breastfeeding

- BF infants have lower illness & mortality rates compared to formula fed infants even in developed countries
- BF infants have better neurological development
- Breastmilk provides:
  - Optimal nutrition
  - Key digestive enzymes
  - Direct immunologic protective factors, immunomodulators, anti-inflammatory factors, anti-oxidants
  - Growth factors, hormones & other bioactive factors
  - New components and interactions being discovered daily!
- Economic benefits (family and society)
  - No cost for formula
  - Reduced healthcare costs
  - Reduced employee absenteeism

Risk Reduction Associated with ANY BF for:

- GI infections (including NEC & gastroenteritis)
- Otitis media
- Hospitalization for lower respiratory tract infections
- Allergies & autoimmune disorders (including Crohn’s & Ulcerative Colitis)
- SIDS
- Childhood leukemia
- Childhood asthma
- Type I & Type II DM
- Obesity
- ADHD
- Obstructive Sleep Apnea

Benefits to the ELBW Infant

- GI benefits
  - Empties from stomach faster
  - Fewer residuals
  - Faster progression to full enteral feedings; fewer days of parenteral nutrition
  - Factors may stimulate GI growth, motility, & maturation
  - Enzymes improve absorption and utilization of nutrients in the immature gut
  - Decreased risk of NEC
- Decreased risk of infection
  - Sepsis
  - UTIs
- Neurodevelopmental
  - Higher IQ
  - Improved visual development & reduced ROP

Extreme Prematurity / ELBW Infants
Brain Growth and Development

- Brain grows 260% in the 3rd trimester.
- Prematurity results in need for catch up.
- Even as late as 35 weeks, the brain weighs only 65% of what it will weigh at 40 weeks.

Birth Statistics in California—Percent of Total Live Births

- Term: 96.8%
- Preterm: 11.0%
- Very Preterm: 0.7%
- Extremely Preterm: 10.5%

Total Births = ~560,000

ELBW Survival and Morbidity Rates

<table>
<thead>
<tr>
<th>Gestational Age</th>
<th>Survival Rate</th>
<th>Survival Without Morbidity</th>
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</thead>
<tbody>
<tr>
<td>22</td>
<td>6%</td>
<td>0%</td>
</tr>
<tr>
<td>23</td>
<td>26%</td>
<td>8%</td>
</tr>
<tr>
<td>24</td>
<td>55%</td>
<td>9%</td>
</tr>
<tr>
<td>25</td>
<td>72%</td>
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<tr>
<td>26</td>
<td>84%</td>
<td>34%</td>
</tr>
<tr>
<td>27</td>
<td>88%</td>
<td>44%</td>
</tr>
</tbody>
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Source: March of Dimes www.marchofdimes.com

Bottom line….preterm infants (particularly ELBW) probably need breastmilk more than anyone!

- Initiate breastmilk trophic feedings (ideally on DOL 1)
- Consider pasteurized donor milk if mother’s own milk is not immediately available
- Ensure adequate milk supply throughout hospitalization until discharge
  - A mother cannot hope to move on to direct breastfeeding after discharge if she is unable to sustain lactation throughout the long hospitalization
- Proper fortification of breastmilk to ensure optimal growth

Lactation Goals for the Preterm Infant

- Mothers of preterm infants have lower BF initiation rates
- These mothers are least likely to initiate & maintain lactation
  - Depends on ability to initiate and maintain supply via pumping
  - Mechanically expressing for a prolonged period makes it difficult to achieve and maintain an adequate volume
  - Volumes of mothers of preterm infants often decline at ~2-6 weeks
  - Disproportionately born to socioeconomically disadvantaged mothers

Lactation Realities for the Preterm Population

- Barriers to Initiation
  - Pregnancy related maternal medical complication (IVF, PIH, etc.)
  - Lack of privacy within the unit
  - Frequent interruptions from staff, family, friends
  - Inadequate pump after mother discharged home
  - Stress of having a baby in the NICU

- Barriers to Maintenance
  - Separation
  - Distance to the NICU
  - Return to work
  - Time management
  - Maternal disappointment over small expressed volumes
  - Stress of having a baby in the NICU
Other Barriers to Pumping & Direct BF in the Preterm Infant

- Balancing need for nutritional support with promotion of BF
- Need (or perceived need) to “measure” intake
- First feeding at bottle vs. at breast
- Culture of bottle feeding “to discharge sooner”

Interventions Shown to Enhance Lactation

- Early skin-to-skin (STS) contact
  - Results in lactating average 4 weeks longer
- Increased maternal support directed at behavioral factors
- Access to lactation consultants
- Educational sessions for mothers
  - Clarity & consistency of message (importance of providing milk)
  - Instructions provided in AV format (pumping, hand expression, etc.)

Interventions Shown to Enhance Lactation, cont’d.

- Initiate pumping or hand-expression within 6 hours of delivery
- Immediate access to hospital-grade pump
  - Assistance in obtaining a pump for home
- Hand expression and hands-on pumping
  - Shown to increase average daily milk volumes by 48% despite pumping fewer times

Our Journey at CHOC Children’s
Lactation Data and NICU Culture

- Internal data at CHOC Children’s showed:
  - Total NICU lactation rates at D/C constant 2005-2011
  - However, availability for the VLBW had decreased

- Bedside staff had begun to view all aspects of lactation as the responsibility of the lactation consultant
  - Not realistic for LC to do all feedings at breast for all of the babies
  - Mothers needed assistance with pumping at all hours of the day

CHOC Children’s NICU and Small Baby Unit (SBU)

- Free standing children’s hospital
  - 279 total beds
  - Adjacent to a delivery hospital
  - Transfers from delivery hospital referred to as “inborn”

- NICU Statistics
  - 67 total beds
  - Level IV
  - Avg 775 admits/year 2013-2015

- SBU Statistics
  - Created for ELBW infants born at <28 weeks or <1000 g at birth
  - Opened March 2010
  - Approximately 60 admits per year (adjacent delivery hospital is largest referral source)

SBU Environment and Team

- Physically separate from main NICU
  - Darker, quieter environment for developmentally supportive care
  - Parents can bond with other families in similar situations

- 12 bed unit
  - 4 individual rooms (2 surgical suites)
  - 2 pods consisting of 4 beds each

- Core RN staff & multidisciplinary team
  - Specialized didactic training
  - Use of evidenced-based guidelines & checklists to standardize approach of care

SBU Medical Outcomes

- Weekly multidisciplinary pharmacy/nutrition rounds
  - Dietitian, lactation consultant, pharmacist, NP, MD, and RN
  - Focus on nutritional intake (including breastmilk usage) & meds

- Significantly improved outcomes
  - Reduction in CLD (from 47.5% to 35.4%)
  - Reduction in infections (from 39.3% to 19.4%)
  - Reduction in growth restriction at D/C (from 62.3% to 37.3%)
    - Defined as weight and head circumference <10th %ile
SBU Lactation Intervention Study

Why target the SBU for intervention?

- As mentioned, these mothers are at risk of not initiating or sustaining pumping.
- SBU would be a well-defined population, physically separated from the rest of the unit.
- Adjacent delivery hospital is the largest single referral source for the SBU.
  - These “inborn” infants come immediately to CHOC Children’s rather than spending time in a birth hospital’s NICU before being transferred.
  - Consequently, internal initiatives have the biggest impact on this population due to the effect of the critical first days when lactation is established.

Phase I Interventions

- Initiated July 2012
- Lactation consultant hours within hospital reallocated.
  - One LC was assigned to the SBU with approximately 75% of her time focused on this population.
- All SBU received regular support from the LC at a minimum of once weekly.
- Bedside nurses helped promote lactation through:
  - Skin-to-skin (STS) campaign within the unit
  - Focusing more on encouraging pumping efforts

Phase II Interventions

- Initiated May 2013
- Continued phase I efforts
- Added interventions for the “inborn” SBU infants:
  - Provided mothers with hands-free pumping bra
  - Provided mothers audiovisual instruction on hand expression and hands-on pumping (video or taught in person by LC)
Data Collected

- GA at birth, discharge, non-nutritive BF started, BF started
- Birth weight
- Previous lactation experience
  - Exclusive >6 months
  - Exclusive <6 months
  - Partial
  - None
- Time to first pumping
- DOL bra and video/demonstration provided
  - Mother using pumping bra (yes/no)
  - Mother watched videos (yes/no)
- BM/BF within 7 days of DC
- Breastmilk contraindicated

Results and Outcomes

- 39 patients were eligible for the study ("inborn" only)
  - 35 patients completed the study
  - 1 declined participation
  - 3 expired
- No significant differences in GA between the 2 groups (those with and those without breastmilk at discharge)
- 5 patients developed NEC
  - 2 continued lactation through hospital discharge
  - 3 discontinued pumping during hospitalization
- 7 patients were discharged with a feeding tube
  - 5 with breastmilk
  - 2 without breastmilk

Gestational Age Comparison Between Groups at 3 Milestones
### Discussion

- **ELBW targeted interventions were successful**
  - Breastmilk at discharge in ELBW patients ↑ by 46%
    - Increasing from 46% at baseline to 67% at end of the study
- **Earlier STS contact had positive impact**
  - Supports reports in literature
  - More critically ill infants may be unable to STS as early
  - May be this lack of STS combined with other stresses & barriers that ultimately lead to cessation of lactation
- **Hours to first pumping did not influence lactation at d/c**
  - Time to first pumping was actually 15% sooner in the group that ultimately discontinued pumping before discharge
  - However, time to first pumping was >6 hours for both groups which may have been the reason this was not in influencing factor.
Speculated that the increased focus within the SBU helped facilitate a culture change in the unit which had an overall positive impact on lactation.