

Improving Lactation Rates in the ELBW Infant

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Disclosures

- Crystal Deming has nothing to disclose.
- Caroline Steele has served on speakers' bureaus for Mead Johnson Nutrition and Abbott Nutrition.

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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 breastmilk availability at discharge in the ELBW population

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Why Breastfeed?



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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



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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



2007 Agency of Healthcare Quality & Research Report
 Manousi-Bloch A, et al. *BP Acad* 2011;8(4):363-367
 Hauck FR, et al. *Paed* 2011;135:103-110
 Palmer B. *J Hum Lact* 1998;14:93-98
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 Jackson KM, et al. *JAMA* 2006;295(6):703-707

Extreme Prematurity / ELBW Infants



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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



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Brain Growth and Development

23 weeks 40 weeks

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Brain Growth

40 35

- 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.

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Loftin RW, et al. Rev Obstet Gynecol. 2010;3(1):10-19.

Birth Statistics in California—Percent of Total Live Births

Category	Percent
Term	86.8%
Preterm	11.0%
Very Preterm	10.5%
Extremely Preterm	0.7%

Total Births = ~560,000

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Source: March of Dimes www.marchofdimes.com

ELBW Survival and Morbidity Rates

Gestational Age	Survival Rate	Survival Without Morbidity
22	6%	0%
23	26%	8%
24	55%	9%
25	72%	20%
26	84%	34%
27	88%	44%

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Stoll et al. Pediatrics. 2010. NICHD Report 2003-2008.

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



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Lactation Goals for the Preterm Infant

- 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

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Lactation Realities for the Preterm Population

- 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



Maestri R, et al. *J Hum Lact*. 2012;28(1):370-378.
 Sisk P, et al. *J Hum Lact*. 2010;26(4):368-375.
 Robinson R, et al. *J Hum Lact*. 2009;25(1):270-279.
 Jones E, et al. *Arch Dis Child*. 2007;92:F216-F218.
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Barriers to Breastmilk Expression for the Preterm Infant

- 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



Sisk P, et al. *J Hum Lact*. 2010;26(4):368-375.
 Jones E, et al. *Arch Dis Child*. 2007;92:F216-F218.
 Furman L, et al. *Paed*. 2002;130(6):657-663.
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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”



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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.)



Sisk P, et al. J Hum Lact. 2010;26(4):368-375.
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 Pinelli L, et al. Arch Pediatr Adolesc Med. 2001;155:548-553.
 Jones L, Spencer SA. Arch Dis Child. 2007;92(4):F236-F238.

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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



Photo © Jane Morton, MD, FAAP



Photo © Kay Hoover, MEd, IBCLC

Rudwell L, et al. Pediatrics. 2008;122:569-576.
 Morton J, et al. J Perinatol. 2009;29:757-764.

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Our Journey at CHOC Children's



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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



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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)



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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



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Morris M, et al. Pediatrics. 2015;136(4).

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 $< 10^{\text{th}}$ %ile



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SBU Lactation Intervention Study



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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.

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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

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Phase II Interventions

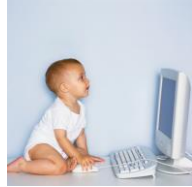
- Initiated May 2013
- Continued phase I efforts
- Added interventions for the "inborn" SBU infants:
 - Provided mothers with hands-free pumping bra
 - Provided mothers audiovisual instruction on hand expression and hands-on pumping (video or taught in person by LC)



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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



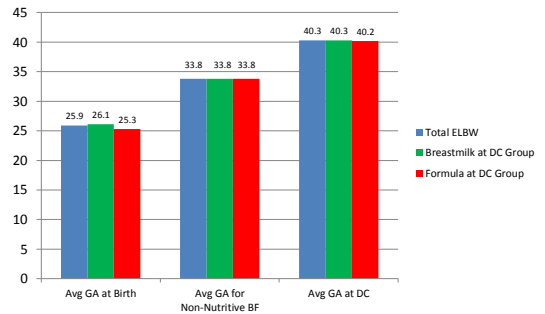
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Demographics

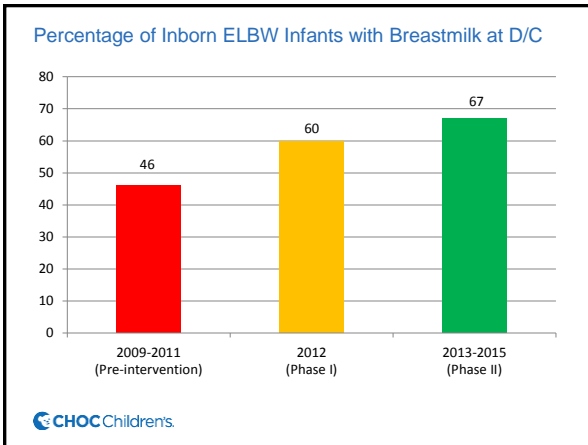
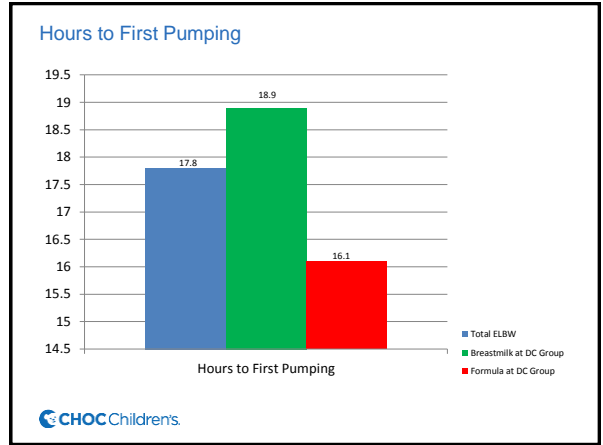
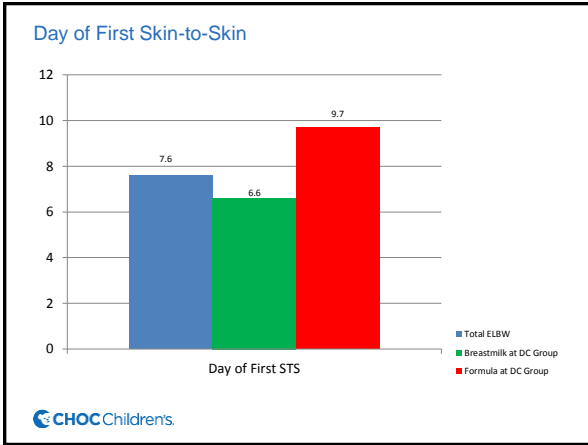
- 39 patients were eligible for the study ("inborn" only)
 - 35 patients completed the study
 - 1 declined participation
 - 3 expired
- No significant differences in GA between the 2 groups (those with and those without breastmilk at discharge)
- 5 patients developed NEC
 - 2 continued lactation through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

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Gestational Age Comparison Between Groups at 3 Milestones



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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.

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Conclusion



Speculated that the increased focus within the SBU helped facilitate a culture change in the unit which had an overall positive impact on lactation.

