



Early Milk for the Early Bloomer: Supporting Mother's Own Milk for the Late Preterm Infant

Christine Culppeper, MD
Neonatologist
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Financial Disclosure

- No relevant financial relationships with any commercial interests.

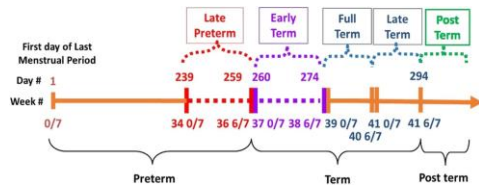
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Objectives

- Define late preterm infant (LPI) and review why these infants have increased morbidity and mortality compared to full term infants
- Discuss the benefits of breastmilk along with the challenges of breastfeeding the late preterm infant
- Introduce the Spoons for Success initiative to increase mother's own milk for preterm infants
- Watch video on hand expression
- Comment on additional in hospital care for the late preterm infant: Vermont Oxford Network (VON) Early Bloomers project

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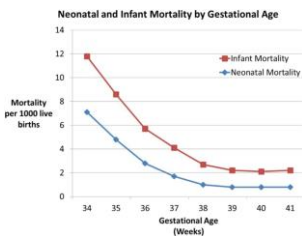
AAP Clinical Report



Stewart Pediatrics 2019

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Neonatal and Infant Mortality



Stewart Pediatrics 2019

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The Great Imposters



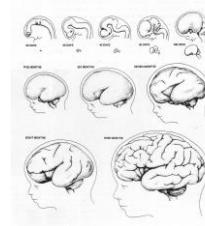
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Late Preterm Infant (LPI)

- Increased morbidity and mortality:
 - Apnea
 - Temperature instability
 - Poor feeding
 - Respiratory distress
 - Hypoglycemia
 - Hyperbilirubinemia
- Higher rate of readmission

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Brain Development

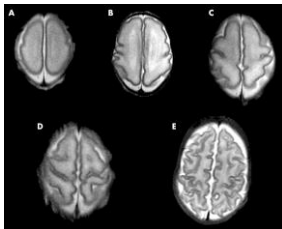


Volpe, Neurology of the Newborn, 3rdEd, 1995

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Brain Development

Development of sulcation and gyration with increasing GA. Transverse T2 weighted FSE images at the level of the central sulcus at: (A) 25 weeks GA; (B) 28 weeks GA; (C) 30 weeks GA; (D) 33 weeks GA; (E) 39 weeks GA.



Counsell Arch of Disease 2003

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Feeding Difficulties

- Poor coordination of sucking and swallowing
- Decreased oromotor tone
- Inability to generate adequate intraoral pressures during sucking



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Suction Pressure for Milk Removal

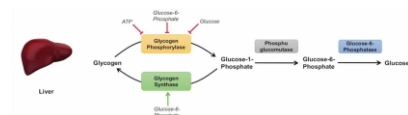


- Elongate the maternal nipple approximately three times its resting length
- Goal for tip to be close to juncture of hard and soft palate

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Hypoglycemia

- Poor feeding
- Inadequate glycogen stores (most stored at end of 3rd trimester)
- Decreased glucose production (less mature level of enzymes that breakdown glycogen into glucose into bloodstream)



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Liquid Gold

- Benefits of breastmilk
 - Nutritional – omega-3 fatty acids
 - Gastrointestinal – decreased NEC, improved gastric emptying
 - Immunological – bioactive components
- Decrease incidence of:
 - GI infections
 - Lower respiratory tract infections
 - Otitis media
 - Hypertension
 - Diabetes
 - Allergies

Section on Breastfeeding Pediatrics 2012

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AAP Section on Breastfeeding

- Breastfeeding and the use of human milk confer unique nutritional and nonnutritional benefits to the infant and mother
- Optimizes infant, child and adult health as well as child growth and development
- Recommends exclusive breastfeeding for about 6 months
- Endorse the WHO/UNICEF “Ten Steps to Successful Breastfeeding”

Section on Breastfeeding Pediatrics 2012

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10 Steps to Successful Breastfeeding

Key clinical practices

3. Discuss the importance and management of breastfeeding with pregnant women and their families.
4. Facilitate immediate and uninterrupted skin-to-skin contact and support mothers to initiate breastfeeding as soon as possible after birth.
5. Support mothers to initiate and maintain breastfeeding and manage common difficulties.
6. Do not provide breastfed newborns any food or fluids other than breast milk, unless medically indicated.
7. Enable mothers and their infants to remain together and to practice rooming-in 24 hours a day.
8. Support mothers to recognize and respond to their infants' cues for feeding.
9. Counsel mothers on the use and risks of feeding bottles, teats and pacifiers.
10. Coordinate discharge so that parents and their infants have timely access to ongoing support and care.

www.tensteps.org

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10 Steps to Successful Breastfeeding



www.tensteps.org

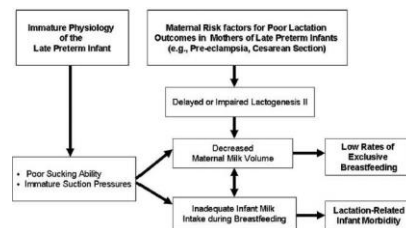
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Maternal Milk Supply

- Medical conditions
 - Diabetes
 - Pregnancy-induced hypertension
 - Chorioamnionitis
 - Cesarean-section birth
 - Multiples
- Supply and demand nature of breastfeeding

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Poor Lactation Outcomes



Meier Clin Perinatol. 2013

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Double Edged Sword

- Breastmilk = liquid gold
- BUT ... exclusive breastfeeding is a risk factor for readmission
 - Dehydration
 - Failure to thrive
 - Hyperbilirubinemia



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"A majority of factors negatively influencing milk volume in lactating mothers are NOT amendable to change, so clinicians must focus on modifiable interventions to increase milk volume"

Parker Journal of Perinatology 2012

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Spoons for Success

Initiative to facilitate breastfeeding in the NICU and early feedings for late preterm infants.

Christine Culpepper MD, Brandi Sprouse
RN IBCLC, Kathy Freeman RN IBCLC, and
Patti James NNP



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Spoons for Success

- Goals:
 - Promote supportive breastfeeding environment
 - Avoid some of the common barriers that prevent moms from providing breastmilk when unable to directly breastfeed
 - Moms not pumping or hand expressing for several hours after delivery
 - Realizing too late that a mom has a milk supply issue
 - Increase mother's own milk while reducing use of donor breastmilk
 - Increase our rate of breastfeeding at time of discharge

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Steps to Create Supply

- Anticipate High Risk Delivery or NICU Admission?
- Does the mother desire to breastfeed?
- First Goal is "Early Expression"
 - Hand express or pump milk within **ONE** hour of delivery
- Second Goal is "Eight Expressions"
 - Encourage 8 hand expression/pumping sessions in the first 24 hours
- Third Goal is "Support to Succeed"
 - Daily lactation visits (first 7 days)

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Spoons for Success Bags



- Contains spoons, syringes, swabs, yellow stickers, pumping log and instructions

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Expressed Breastmilk Log

Day	Date	Lactation consult	Time & Amount							Daily total	Daily total target amount
Day 1										None	
Day 2										None	
Day 3									25.75 ml (0.3 ml)		
Day 4									75.150 ml (0.3 ml)		
Day 5									120.325 ml (0.3 ml)		
Day 6									225.300 ml (0.3 ml)		
Day 7									400.375 ml (0.3 ml)		
Day 8									375.450 ml (0.3 ml)		
Day 9									450.525 ml (0.3 ml)		
Day 10									545.600 ml (0.3 ml)		
Day 11									600.675 ml (0.3 ml)		
Day 12									600.750 ml (0.3 ml)		
Day 13									750.825 ml (0.3 ml)		
Day 14									750.900 ml (0.3 ml)		

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Hand Expression

- Goal is to begin hand expression after first feed or within one hour after delivery
- By 2nd day after delivery or after 8 hand expressions make sure mom is set up with hospital grade pump



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Effect of Early Breastmilk Expression on Milk Volume

- Pilot study
- 20 women randomized to initiate milk expression within 1 hour OR 1-6 hours

Table 1. Milk volume (ml)

Day	Volume of milk	
	Early initiation (n=10)	Late initiation (n=10)
Initial expression volume	4.39	6.11
Day 1	19.2	6.7
Day 2	78.7	1.2
Day 3	162.5	6.4
Day 4	185.7	6.9
Day 5	20.9	6.6
Day 6	233.0	6.6
Day 7	35.0	6.1
Total at 1 week*	126.7	60.1
3 weeks†	N=6	N=7
	63.0	20.2
6 weeks‡	N=6	N=6
	43.8	20.0

*Sum of all milk volume for days 1-7
 †Sum milk volume at 3 weeks
 ‡Sum milk volume at 6 weeks

Parker Journal of Perinatology 2012

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Association of Timing of Initiation of Breastmilk Expression on Milk Volume

TABLE 3. VALUES FOR THREE CATEGORIES OF INITIATION TIME POINT OF BREASTMILK EXPRESSION FOR COMPARISON WITH TWO CATEGORIES (UP TO 6 HOURS VERSUS MORE THAN 6 HOURS)

Breastmilk (mL)	Initiation time point			p value*
	Within 1 hour (n=10)	>1 and ≤6 hours (n=10)	After 6 hours (n=20)	
Initial amount	0.1 (0-0.3)	0 (0-0.1)	0 (0-0)	0.002
Day 1	7.0 (0-28.5)	0.0 (0-0.4)	0 (0-3.5)	0.122
Day 2	16.0 (4.1-108.7)	0.5 (0-2.0)	4.3 (1.5-17.1)	0.009
Day 3	88.0 (14.2-208.5)	19.5 (0-45.2)	11.5 (1.3-43.4)	0.099
Day 4	85.5 (62.2-399.7)	28.2 (15.3-40.8)	49.4 (13.0-143.4)	0.213
Day 5	232.4 (95.2-405.7)	71.3 (34.9-117.8)	112.1 (50.5-162.4)	0.099
Day 6	294.0 (182.8-370.7)	217.7 (79.2-267.0)	87.1 (50.4-140.2)	0.003
Day 7	306.2 (244.0-384.3)	180.7 (80.8-235.2)	125.7 (65.3-192.7)	0.005
Week 3 (n=23)	543.5 (466.1-818.1)	238.9 (87.8-442.0)	224.3 (100.7-334.5)	0.007
Week 6 (n=14)†	440.0 (152.1-576.4)	209.0 (64.1-355.8)	358.7 (134.3-504.7)	0.024
Lactogenesis stage II (hours)	90 (24-120)	126 (108-204)	72 (60-108)	0.047
3 weeks‡	70% (7/10)	70% (7/10)	45% (9/20)	0.343
6 weeks‡	60% (6/10)	40% (4/10)	20% (4/20)	0.080

Data are median (interquartile range [25th-75th percentile]) or percentage values as indicated.
 *p values obtained from the Kruskal-Wallis test.
 †Sample size for Week 6: within 1 hour: n=2; >1 and ≤6 hours: n=7; after 6 hours: n=4.

Parker Breastfeeding Medicine 2015

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Hand Expression Video

- <https://firstdroplets.com/abcs/>

Dr. Jane Morton Stanford Medicine 2006

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Medela Symphony Pump

- Initiate Program:
 - Designed to be like a baby's sucking pattern in the first few days of life.
 - 15-minute program pauses midway and will chime when it automatically ends.
 - Use this setting until 3 consecutive bottles of 20ml of breastmilk are pumped, or for the first 6 days.
- Maintain Program



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Early Bloomers

2019 VON Project:
Care of the Late Preterm Infant



Cecilia Luedloff MD, Patti James NNP, Cari Addington APRN, Brandi Sprouse RN IBCLC, Kathy Freeman RN IBCLC, Chelsea Matthews RN, Amanda Bonderant RN, Tara Smith RNC-NIC, Kerry Rose OT, Heather Bailey RN, Jennifer Schuchknecht



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Targeted Interventions

- Parent education regarding risk factors and expected plan/hospital course
- Staff education on care of LPI
- Late preterm order set:
 - Frequent vital signs
 - Supplementation if breastfeeding
 - Glucose monitoring
 - Delaying bath & hearing screen
 - Car Seat Challenge
 - Discharge after 48-72 hours of age

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Crib Card



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Feeding the LPI

- Late preterm immediate care order set placed by nurses on admission
- Breastfeed with cues at least every 2-3 hours
- Assist mom hand expression/pumping after each feeding
- Supplement infant with 3-5 mL EBM/DBM via syringe after each feeding or attempt
- Supplementation increased per physician after first 24 hours

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Parent Guide

- **Help me feed by:**
 - Feeding me on demand (anytime I show feeding cues), but at LEAST every 2-3 hours
 - Helping me wake up to feed. Sometimes I need extra help waking up, so we can make sure I get at least 8-12 feedings in each 24hour period
 - Pumping and/or hand expressing after I eat because I may not breastfeed well yet (pump/express **at least** every 3 hours) and may need extra milk.
 - Asking my nurse or lactation consultant to watch me feed to see if I need more – they are here to help!

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Feeding Tips

- 1 mL DBM ≠ 1 mL colostrum
- Syringe/finger feeding ok for 5-10 mL, consider bottle if needing more
- Recommend slow flow nipple (Dr. Brown preterm nipple) and paced feeding if using bottle



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Academy of Breastfeeding Medicine Clinical Protocol #10: Breastfeeding the Late Preterm and Early Term Infants

- Importance of PROACTIVE lactation management strategies for many late preterm infants and some early term infants
- Importance of early expression of colostrum within the first hour after delivery
- Role of hand expression with or without mechanical expression in the initial postpartum hours and days

Boies Breastfeeding Medicine 2016

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Hospital Discharge

- Does mom have electric breast pump?
- What to use for supplement?
- Feeding plan that works for mom and baby
 - Triple feeding
 - Breastfeed during day with bottle at night
- Follow up with lactation
 - Goal to transition off supplementation and lactation technologies (pump, nipple shield)

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Summary

- Late preterm infants have higher morbidity and mortality compared to term infants
- Breastfeeding is recommended but can be very challenging
- Two key objectives are
 - 1) Protecting the milk supply – pumping/hand expression, LACTATION!
 - 2) Ensuring the infant is adequately nourished – supplementation

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Questions

 WashingtonRegional

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