Picasso and Breastfeeding: Keeping Bedside Care Simple for Low and High Dyads

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I have no disclosures and do not intend to discuss an unapproved or investigative use of a commercial products.

Jane Morton, MD

The synergy of nursing

"Risks of NOT breastfeeding"

AAP's Section on Breastfeeding: Meek JY. BF Office, Pediatrics. 2017

INFANT	MOTHER
↑ SIDs, "crib death"	↑ breast and ovarian cancer
↑ obesity	↑ type 2 diabetes
↑ asthma	↑ heart disease
↑ certain childhood cancers	↑ postpartum depression
↑ diabetes	
↑ postneonatal death	

Picasso and Breastfeeding

OUTLINE

- The Challenge:
  - Prevent early complications
- The Science:
  - A,B,C
  - Low vs. high risk
- A Proposed Solution
  - Integrate science into practice in first hour care
  - Empower parents

Objectives

- Objectives: Participants will understand:
- The practical implications of incorporating research on maximizing milk production into current breastfeeding bedside care
- Given the goal of enabling exclusive breastfeeding, the rational for prioritizing A,B,C for the low risk dyad and reprioritizing these goals to C,B,A for at-risk dyads.
- How this reprioritization might provide a more realistic, safe, unpressured plan for the at-risk infant

The Challenge:

Prevent (vs. wait for)

early breastfeeding complications

Keep it simple!

says Picasso and Steve Jobs

The Challenge: Prevent Early Complication

- A Attachment
  - Difficulty with latch or milk transfer
- B Breastmilk production
  - Mothers who won't make enough milk
- C Calories
  - Babies who won't receive enough milk

The Challenge: Prevent Early Cessation

- Complications related to A, B and C
  - Major causes for stopping earlier than planned, with drop off (~20%) in any bfeeding before 1 month
  - Result in serious health and financial burdens (hyperbilirubinemia, dehydration, hypernatremia)
  - Key reasons for delayed discharge and readmission (within 2 wks) GLOBALLY
- What we do (or do not do) in the first 3 days (1st hour) directly relates to these complications

The Challenge:
Prevent early cessation

Increased risk of early cessation if < 39 wks

- Breastfeeding rates: (40 wk) > (37-39 wk) > (< 30 wk) **≥** (34-36wk)
- Morbidity doubles for each gestational wk earlier than 38

- The population of early babies (< 39 wks) is unlikely to decrease due to
  - demographic factors (obesity, advanced maternal age*)
  - obstetrical practices (32.2% cesarean rate, inductions, multiples)

*About 15% of US mothers are ≥ 35 yrs; 2.6% are ≥ 40

The Challenge:
Prevent “suboptimal intake jaundice”

Flaherman VJ, Maisels MJ. ABM Protocol #22, 2017

- With the exception of infants with pathologic conditions…the single most important clinical risk factor for hyperbilirubinemia in newborns is decreasing gestational age. For each week of gestation below 40 weeks, the odds of developing a TSB ‡428 lmol/L (25 mg/dL) increase by a factor of 1.7 (95% CI 1.4–2.5)

Births in US Baby-Friendly hospitals; 2.9% in 2007 ➡ 20.01% in 2017

- Written breastfeeding policy
- Train all staff
- Inform all women about benefits and management
- Show moms how to breastfeed and maintain supply if separated
- ★ **Initiation in first hr.**
- Exclusive breastmilk feeds unless medically-indicated
- ★ **24 hour rooming in**
- Demand breastfeeding
- No pacifiers or bottles
- Providing information on bf support

Ward LP. Improving exclusive breastfeeding in an urban academic hospital. Pediatrics 2017 (37% to 59%)

What more could we do?

Disparity in Breastfeeding Rates

EQUITY vs. EQUALITY?

Do Black–White Racial Disparities in Breastfeeding Persist in the Military Community? **Lundquist J. 2015**

The black–white gap in breastfeeding duration common among civilians is significantly reduced among military affiliates, by providing:

(a) stable employment/educational opportunities

(b) uniformly available, covered lactation support

QUESTION: Might normalizing the use of hand techniques with breastfeeding from the first hour reduce complications associated with early cessation and offer a “leg up” to all high risk dyads?

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The low-risk dyad

- What can we expect if:
  - The mother is healthy, motivated, educated
  - The baby is healthy and delivered at term
  - The hospital has staff trained in lactation support

A. attachment

B. breastmilk production stimulation

C. calories (**normal and adequate intake**)

Misconceptions about ABC
I used to think…

- *(Attachment)* The learning process starts at birth when the baby first looks for the breast
  - WRONG!
- *(Breastmilk production)* Hormones control production
  - WRONG!
- *(Calories)* Colostrum is nutritious.
  - WRONG!

A: attachment
4 Key Points

1. FIRST HOUR

The longer the interval between birth and first feed, the greater the risk for dysfunctional attachment

Carberry AE. Breastfeeding Medicine 2013; Dewey KG. Pediatrics 2003

First hour breastfeeding is the practice most predictive of exclusive breastfeeding in the hospital after vaginal or c-section delivery.

Perrine et al, Pediatrics 2012 Jul;130(1):54-60.
Kacica, MA. Breastfeeding Medicine 2012 7(6) 409

OBJECTIVE A: attachment
The olfactory continuity
Prenatal priming for first feed, the last step of the birth process

- Rooting, swallowing, sucking prenatally
- Amniotic fluid pheromones, unique to each mother (genetics/diet)
  - Stimulate nutritive behavior
  - Chemically similar in colostrum and Montgomery gland secretions

Doucet S et al. The secretion of areolar (Montgomery's) glands from lactating women elicits selective,unconditional responses in neonates LoS One. 2009 Oct 23;4(10):e7579.

Guiraudie-Capraz G et al. Biochemical and chemical supports for a transnatal olfactory continuity through sow maternal fluids. Chem Senses. 2005 Mar;30(3):241-51.

Marlier L. Human newborns prefer human milk: conspecific milk odor is attractive without postnatal exposure. Child Dev. 2005 Jan-Feb;76(1):155-68.

Schaal B,.Chemical and behavioral characterization of the rabbit mammary pheromone. Nature. 2003 Jul 3;424(6944):68-72.

The Breast Crawl

- 2011 Stockholm: OBSERVATIONAL REPORT: 9 behavioral phases for “optimal self-regulation”: birth cry, relaxation, awakening, activity, crawling, resting, familiarization, suckling
- 28 term vaginal births placed between the breasts, eyes level with nipples, and given 120 minutes of uninterrupted time. Eighteen of the 28 infants reached the areola by themselves and started touching and licking, (primary outcome variable in this study) and 15 of them began suckling spontaneously.
- ` So **54% of healthy vaginal births, given 120 min., began breastfeeding.** They hypothesized this results in “optimal self regulation”. No outcome measures to support this.

Windstrom AM, Acta Ped 2011.

The Breast Crawl

- In a subsequent study with 11 cesarean and vaginal births, NO demonstration of changes in breastfeeding rates with “optimal self regulation”. Outcome differences were demonstrated between infants with or w/o separation or instrumentation.

  Crenshaw JT, Breastfeeding Med. 2012

- No RCT demonstrates any beneficial outcome comparing independent breast crawl to gentle cue-based assistance.

Not always automatic…
Comparison of breast crawl (BC) between vaginal and cesarean deliveries

Heidarzadeh M. Breastfeeding Med. 2016. Aug

- Term, unmedicated NSVD (n=292), and cesarean deliveries (n=107), given 60 min. to simply attach (not feed) with no assistance
- Roughly **75%** complete (88.01% vaginal; 11.21% cesarean)
- ***Conclusion:*** Encouraging BC in all dyads

What would the same study show about LPT infants?

A: attachment: Key Points

2. Not always automatic Dewey KG. Pediatrics 2003
3. Improves with uninterrupted contact (assistance)
4. Improvement is production dependent

WHY encourage breastfeeding vs. exclusive expressed milk feeding for term infants?

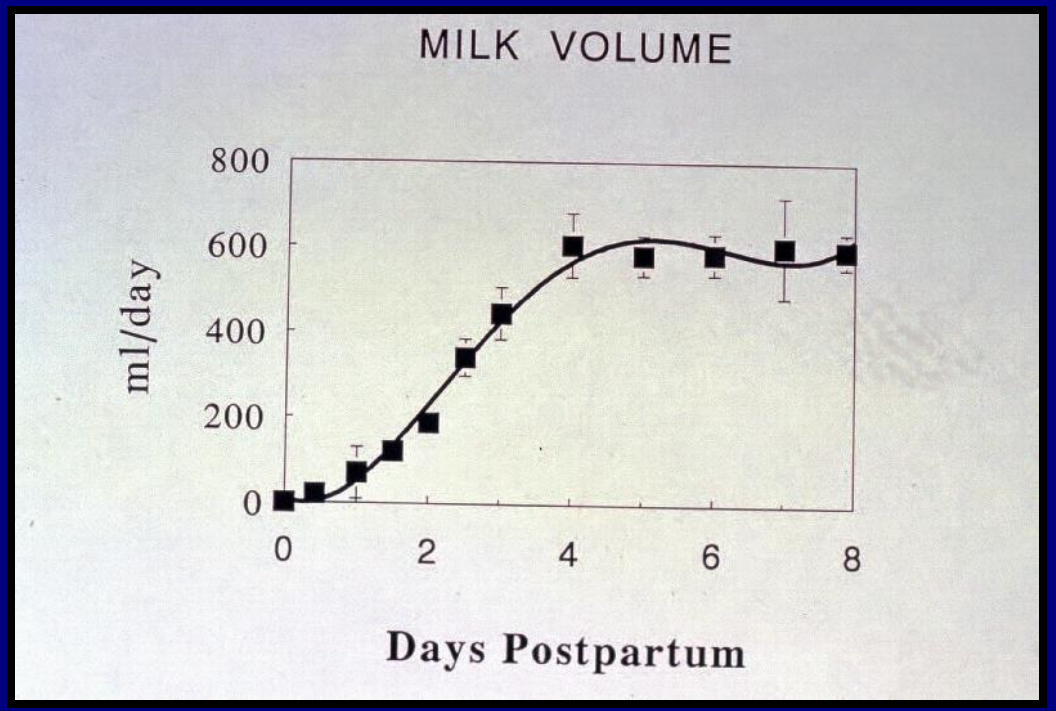
- **Earlier cessation is** associated with exclusive expressed breast-milk feeding compared with direct breastfeeding.

- Bai DL. Public health Nutr. 2017
- Forster D. BMJ Open 2015
- Jiang B. BMC Pregnancy Childbirth 2015
- Fein SB. Pediatrics 2008.

B: breastmilk production: Key Points

1. Production is strongest determinant of duration and exclusivity of breastfeeding
   - Production within first 4 days predictive of future potential
   - Attachment improvement is production dependent

Day 1	Day 3



B: breastmilk production: Key Points

2. Hormones set the stage, yet the early, frequent and effective removal of colostrum determines future production potential, making production time sensitive.

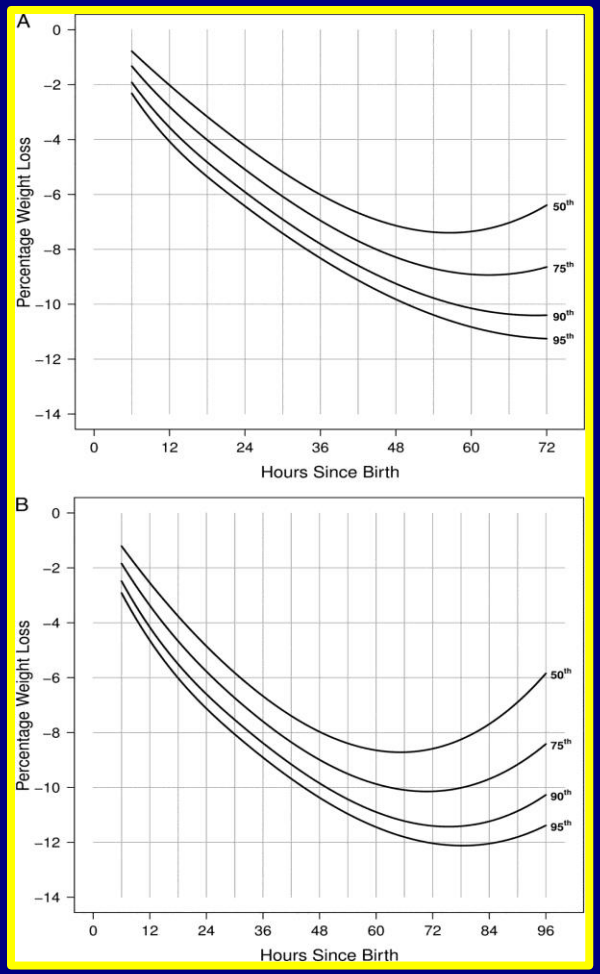
C: CALORIES for TERM INFANTS

- Colostrum, 80% of calories of mature milk or formula
- The AGA TERM newborn's fuel (glucose and ketones) comes mainly from endogenous sources (reserves), not from colostrum: *
  - Breakdown of starch (glycogenolysis)
  - Synthesis from amino acids (gluconeogenesis)
  - Breakdown of fatty acids (ketogenesis)
- Needs small, reserves adequate for term, AGA
- Average weight loss is 6-7%, and weight loss by 6 hrs. is predictive of subsequent >10% loss. Flaherman, 2013, Macdonald PD 2003, Bertini G 2015

Cesarean vs. Vaginal Nomograms, Weight loss differentials by 6 hours

VAGINAL

CESAREAN



Flaherman VJ. Pediatrics 2015
The *Newborn Weight* Tool, or Newt, www.*newbornweight.org*, Hershy

PEDIATRICS®

CALORIES

Liberal hand expressed spoon feeding

Bertini G 2015

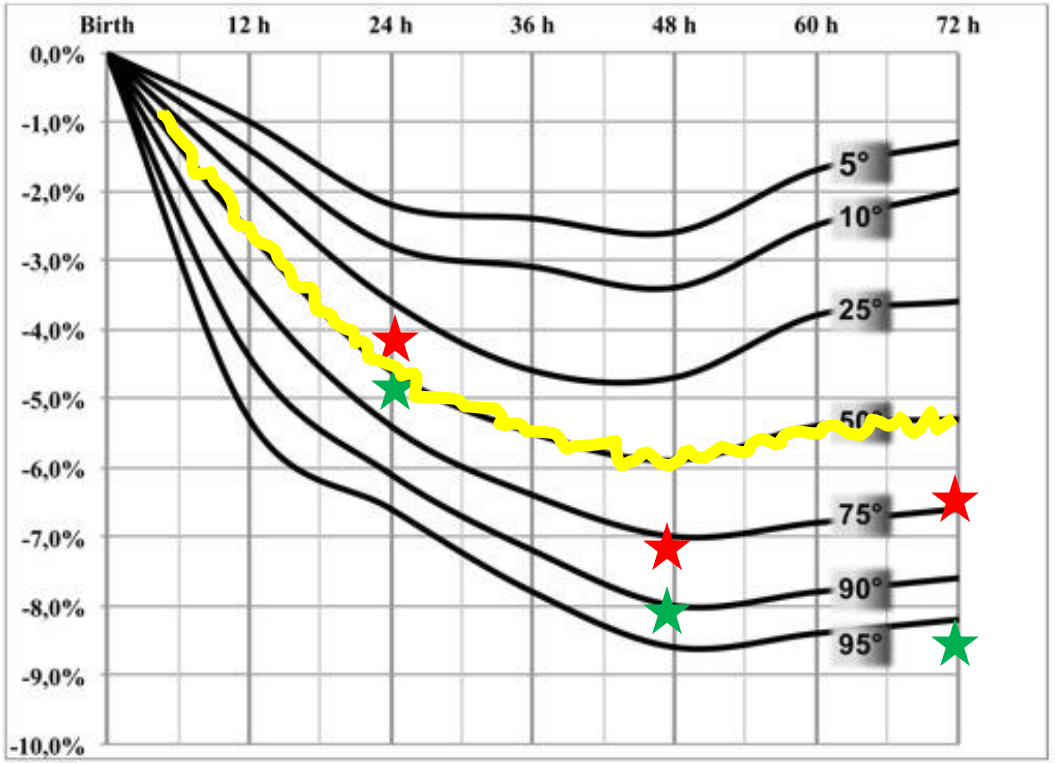
- 1760 “natural births” with 1st hr. feeds
- Low threshold for hand-expressed spoon feeds
- Weight loss 5.95%
- Nadir at 44 hr.
- Zero % with 10% weight loss (3.9% lost˜9%)

Flaherman VJ 2015

- 83,433 vaginal “routine care”
- Rarely used hand expressed spoon feeds
- Weight loss 7.1%
- Nadir at 48-72 hr.
- 10% with 10% weight loss

Mean weight loss for term births, with or without spoon-fed colostrum

Bertini G 2015 vs. Flaherman V, 2015



★vaginal

★cesarean

Born Hungry? Protection vs. Nutrition

- Cord cut = last “supper”, so what’s the hurry?
- More protective than nutritious. Unlike donor milk, a mother’s own colostrum provides “tailor-made”, unique active and passive immunity for the mother’s own infant.
  - Active: ex. immunoglobulins
  - Passive: ex. bioactive components that potentiate the infant’s own immune function within the GI lymphoid tissues
- Most vulnerable:
  - Separated
  - Preterm
  - Cesarean

Summary Points for Low Risk Dyads …as simple as A B C

- A Attachment:
  - **First hour**
  - Effective, “deep latch” may not happen right away
  - Improves with uninterrupted contact and ↑ production
- B Breastmilk production stimulation
  - **First hour,** time sensitive, cornerstone of bfeeding rates
- C Calories (adequate intake)
  - **First hour** protection
  - Weight by 6 hour predictive
  - Liberal use of hand expressed feeds modifies weight loss
  - Needs are small, reserves adequate; prioritize **A** and **B**

Every first hour counts

Potential risks of "missing" the 1st hour

- A (dysfunctional suckling)
- B (insufficient production)
- C (suboptimal intake/protection)

UNICEF, 29 July 2016 "Some 77 million newborns – or 1 in 2 – are not put to the breast within an hour of birth, depriving them of the essential nutrients, antibodies and skin-to-skin contact with their mother that protect them from disease and death."

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Who is at Risk?

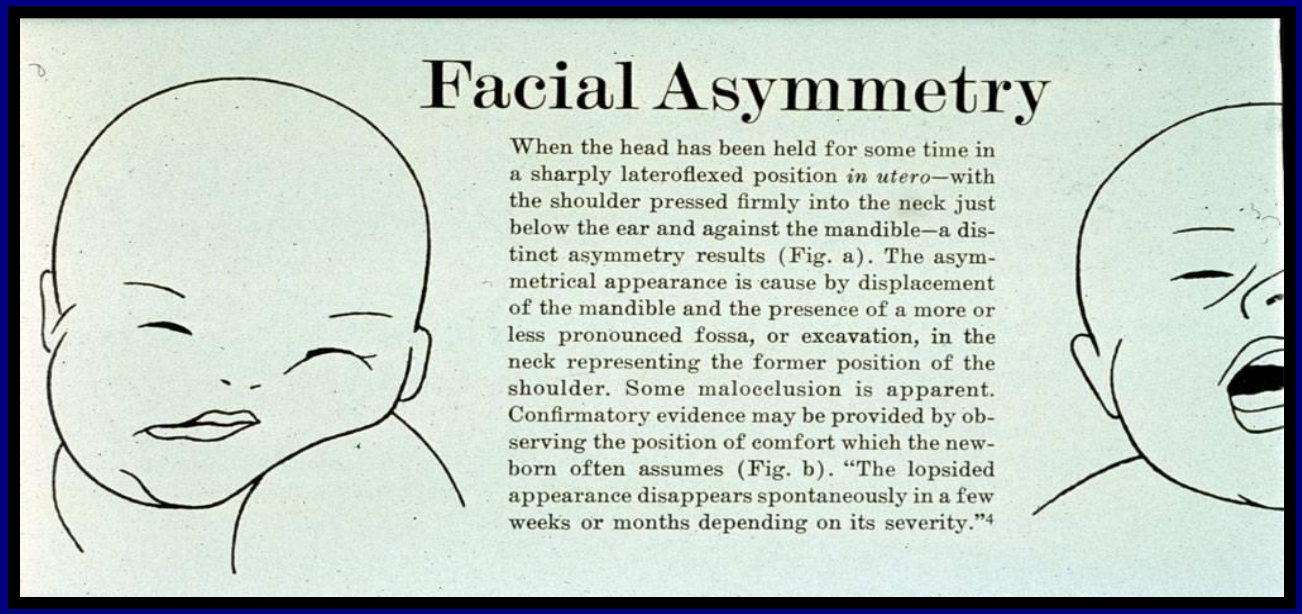
Can all mothers count on a supportive hospital system in any scenario?

“I’m going to TRY.”

1. Friends and relatives may have had problems.
2. Unfamiliar with what it should look like, feel like, sound like.
3. Self-blame, not systemic problem, if breastfeeding fails.
4. Birth is a time of vulnerability, when it takes little to undermine confidence

ALEX

Stay tuned for the rest of the story



Facial Asymmetry

When the head has been held for some time in a sharply lateroflexed position *in utero*—with the shoulder pressed firmly into the neck just below the ear and against the mandible—a distinct asymmetry results (Fig. a). The asymmetrical appearance is cause by displacement of the mandible and the presence of a more or less pronounced fossa, or excavation, in the neck representing the former position of the shoulder. Some malocclusion is apparent. Confirmatory evidence may be provided by observing the position of comfort which the newborn often assumes (Fig. b). "The lopsided appearance disappears spontaneously in a few weeks or months depending on its severity."[4]

Who Is At-Risk?

Mothers at risk for insufficient production (B)

- Maternal-infant separation (cesarean births)
- Breast surgery/anomalies
- Attachment issues (latch and milk transfer)

Infants at risk for insufficient caloric intake (C)

- Infants with compromised reserves
  - preterm infants (LPT and VLBW)
  - postmature infants
- Infants with increased demands
  - Infants of diabetic mothers, SGA infants
  - High bilirubin producers

LPT and Breastfeeding Rates

- Drop off by 1 month in primiparous mothers: *
  - Term: 23.5%
  - Early term (37-<39wk): 27.4%
  - LPT (34-36+wk): 36.2%

- LPT infant breastfeeding rates not impacted by Baby-friendly practices (1st hr. skin-to-skin, rooming-in, no pacifiers) **

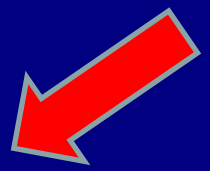
- LPT and Early term births less likely to feed in first hour

- *Hackman NM, Breastfeeding Medicine 2016
- **Goyal NK. Birth 2014, Eidelman A. 2016, Breastfeeding Medicine, editorial 10(3) 2016

The LPT infant (34-<37 weeks)

26-28 wks

30-32 wks



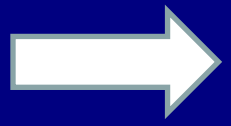
34-36 wks

40-42 wks.

LPT infant, the “at-risk” poster child

- LPT babies are immature in multiple ways. They cannot be expected to behave like term babies.
- Immature thermoregulation
- Immature glucose generating pathways → hypoglycemia
- Immature processing of bilirubin → jaundice
- Immature breastfeeding skills

“THE GREAT PRETENDERS”



Bilirubin encephalopathy

LPT Immature breastfeeding skills

- Passive, sleepy, “content to starve”
- Ineffective milk removal
  - Short sucking bursts
  - Long, frequent pauses
  - Unending feeds
- Anorexia, easy to confuse with satiety

Underfeeding, the culprit

- Medical complications (excessive wt. loss, hyperbilirubinemia, hypernatremia) always relate to **underfeeding** colostrum, never **over feeding.**

- Adverse long-term neurodevelopmental outcomes

The Challenge: Prevent "suboptimal intake jaundice"

Flaherman VJ, Maisels MJ. ABM Protocol #22, 2017

- In normal adults, even 24 hrs of fasting with good hydration, results in a small increase in bilirubin (1-2 mg/dL) due to an increase in enterohepatic circulation.

- Similarly, suboptimal enteral intake of colostrum, (relative starvation) strongly correlates with increased bilirubin and weight loss.

- First and best supplement to prevent hyperbilirubinema is hand expressed spoon/cup-fed colostrum …"In this way, breastfeeding is best supported."

High bilirubin producers

Bhutani VK. J Perinatology 2015

- Assessed ETCOc, (corrected end-tidal carbon monoxide, high with production) with hr-specific TB.
- Impaired elimination was predominant contributing factor in infants with TB <95th percentile, many of whom are low-bilirubin producers.
- Better bilirubin elimination may account for the lack of severe hyperbilirubinemia in some high bilirubin producers (i.e. High milk intake can reduce bilirubin even in high bilirubin producers)

Long-Term Neurodevelopmental Outcome with Hypernatremic Dehydration

Boskabadi H. Breastfeeding Medicine, 2017

- n = 65, Na ≥150 (153–195 mg/dL)
- By 6 mos, 25% vs. 0.3% had adverse growth and neurodevelopmental milestones, with some improvement by 24 mos.
- Factors associated with poor prognosis:
  - poor feeding
  - seizure
  - hyperthermia
  - lethargy

VLBW infants
Avoidance of “underfeeding”

Multiple benefits assoc. with early and aggressive nutritional practices (earlier introduction of human milk, ↑ exclusivity, ↑ mother’s own vs. donor milk, and ↑skin-to-skin time)

Borregas, SP. Acta Pediatr 2017

Lapointe M. Acta Pediatr 2016

Lee J Pediatrics 2015

Seigel JK Breastfeeding Medicine 2013

Montjaux-Regis Acta Pediatr 2011

Briere CE. J Ob Gyn Neonatal Nurs. 2014

Skin-to-skin

VLBW infants

- ↑ milk production (exclusivity)
- ↑ growth velocity
- ↓ extra-uterine growth restriction in 1st wk
- ↑ pre and post discharge breastfeeding rates
- ↓ necrotizing enterocolitis, ↓sepsis
- ↑ transition from bottle to breastfeeding

Oropharengeal colostrum
to ELBW infants

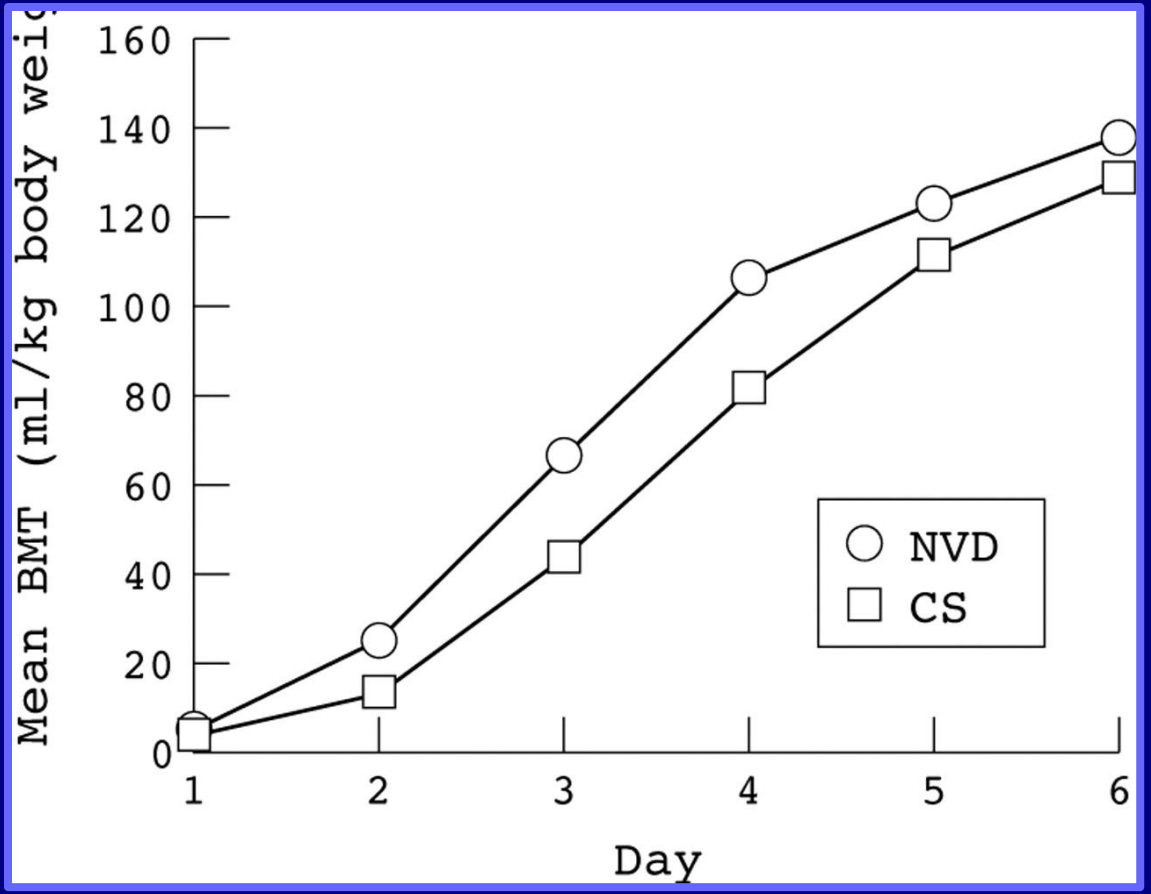
Cesarean Births

- 1st hr feeds, only 3.5% cesarean vs. 71.5% vaginal
  - Less intake when colostrum most available (1st hrs.)
  - Less production stimulation → delayed lactogenesis
  - Greater weight loss evident by 6 hrs. with ≥10% weight loss in 25% cesarean vs.10% vaginal births

    Flaherman 2015, Preer GL, 2012; Fonseca MJ, 2014, Zanardo V, 2010
- Formula by discharge 2X higher (25% vs. 11%)
- Lower bfeeding rates at 7 days, 3 mo, and 6 mo.

  Prior E, 2012 , Zanardo V, 2010
- Less milk transfer over first 6 days Evans KC, 2003

Less breastmilk intake over the first 6 days in caesarean (CS) vs. vaginal (NVD) births



By day 6, only 20% of cesarean infants had regained birth weight compared with 40% of the vaginal births.

K C Evans et al. Arch Dis Child Fetal Neonatal Ed 2003;88:F380-F382

Maternal intrapartum fluid balance?

Chantry CJ. Pediatrics, 2011

- Mothers whose infants had “excessive wt. loss” were more likely to have been induced, have prolonged (>14 hr.) labor, and higher pain ratings.

- Other intrapartum factors may affect impaired early colostrum transfer, and may result in “true” weight loss due to suboptimal intake.

Breastfeeding in the O.R.

First hour breastfeeding for **all**, including cesarean births

- N=565 cesarean births, military hospital in India
- Higher rates of exclusive breastfeeding than with usual hospital care at:
  - discharge (89.13% vs. 75.94%, p=0.004)
  - 2 weeks (85.51% vs. 53.38%, p<0.001)
  - 6 weeks (74.64% vs. 38.35%, p<0.001).
- This single intervention significantly improves rates of exclusive breastfeeding.

Jesmin E, 2015

Over the shoulder hold for cesarean mothers during delivery

Good visibility, no abdominal pressure, easier for mother/partner to express and assist

Why reprioritize goals for at-risk infants?

1. **Attachment**

   passive baby → ineffective milk transfer

2. **Breastmilk production**

   insufficient colostrum removal→ delayed lactogenesis, reduced production

3. **Calories**

   may have (LPT) high energy needs, suboptimal glucose generating pathways → **excessive weight loss**

   insufficient colostrum intake → increased deconjugation and reabsorption of bilirubin → **excessive jaundice**

C,B,A instead of A,B,C

CBA for at-risk dyads..
Can we safeguard C and B and avoid over-focus on A?

C, Calories

- Early, liberal hand expressed, spoon feedings
- ? Prenatal expression/collection

B, Breastmilk production

- 1st hr, then frequent removal

A, Attachment

- Skin to skin, gentle cue-based attachment assistance
- Improves with time, contact and robust production
- Less pressure on milk transfer

Unrestricted breastfeeding and liberal spoon fed, hand-expressed colostrum to satiety:

1) stimulates production
2) increases intake
3) keeps baby exclusively breastfed
4) less pressure on optimal attachment

.

- Most effective with:
  - early initiation
  - high frequency (≥ 7x/d)
  - effective techniques

Why Spoons may be best?

Plastic spoons: no risk, no cost, reusable, readily available, convenient for both collection and delivery of small volumes of colostrum. Not viewed as a “medical intervention”, requires minimal to no training of parents or staff, is safe, effective…and studied.

Spoon/cup fed LPT infants

- Infants cup/spoon fed vs. bottle fed:
  - Most studies involve preterm
  - No difference weight gain
  - No difference gestational age at discharge
  - More likely exclusively breastfeeding by discharge
  - More likely receiving some breastmilk at 3 and 6 months
  - Inconclusive evidence for term infants

Cochrane Review, Aug, 2016 (Flint A)

Complications become less remedial with time. What we may not hear about…

- Exhaustive and demoralizing remedial regimens

- Enormous sense of grief a mother deals with when breastfeeding fails

- Bad press

The Experience of Breastfeeding the LPT Infant A Qualitative Study. Kair LR. 2015 Breastfeeding Med

Good Press: Success spurs success!

.

- Does breastfeeding management need to feel inordinately complicated and demanding for both mothers and staff, with an escalating use of pumps and gadgets?

- Best advocates for breastfeeding are successful mothers.

Dr. Paula Meir's Rush Milk Club

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What More Is Needed?

- Given that morbidity stems from *insufficient production* and *suboptimal intake*

- Given that no amount of skin-to-skin and unrestricted breastfeeding reduces these two problems when infants fail to access sufficient colostrum or stimulate an adequate supply

What More Is Needed?

- Given these time-sensitive problems may worsen by the hour
- Given that many healthy, term infants are unable to automatically latch in first hour (~ 90% cesarean births, 25% all term births)
- Given the appropriate encouragement for exclusive breastfeeding

Can we PREVENT problems with simple solutions?

Think outside of the box!

Lacoste, France

A Bold Mission:
What is still missing?

Not the science

Not the protocols

Not the desire

A sense of confidence and know-how in the expectant mother herself before the big day

Can we change the perception from…

- Breastfeeding is complicated
- Wait for problems to be fixed
- Gadgets, machines necessary
- Depend on hospital routine and professionals

to:“I can do this!”

- All we need to remember is simple (ABC)
- “I understand what needs to happen in any scenario right after my delivery….I have what it takes right from those first exciting minutes.”

Can we keep it simple and prepare ALL parents?

First Hour Breastfeeding
with
A Mother's Touch

Stanford Nursery website, 2017

drjanemorton@gmail.com

video

Proposed Practice Changes to Reduce Risks

- Make every first hour count in every scenario
- Low threshold for hand-expressed spoon feeds
- Prioritize CBA vs. ABC for at-risk dyad.
- Normalize mother/partner helping hands in 1st hour
- Change the message: “You have all you need!”

QUESTION: Might normalizing the use of hand techniques with breastfeeding from the first hour reduce complications associated with early cessation and offer a “leg up” to all high risk dyads?
A question needing an answer.

The rest of the stories…

Yellow stools by day 4 or 5!

A B C

Maybe only what really matters the most, matters at all.