



What's New in Lactation

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Overview

- Language, gender & LGBTQ nursing
- Research and practice
 - Early formula use, early term baby
 - Mammary dysbiosis and mastitis
 - Tongue-tie
 - Jaundice
 - Obesity
- Clinical skills
 - Manual
 - Lactation curve



Language, Gender & LGBTQ Nursing



Language and Gender

Why language changes

Gender binary vs non-binary

MacDonald. *J Hum Lact* 2019; 35(2):223-26


Transgender Men and Lactation

Gender dysphoria

- Distress, anxiety
- 16 of 22 nursed
- May prefer to nurse in private

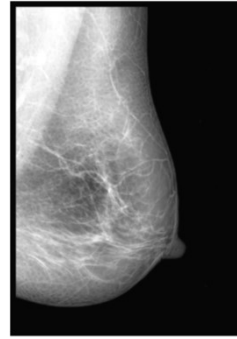
Male hormones, top surgery, and lactation

MDs did not discuss



MacDonald, et al. *BMC Pregnancy Childbirth* 2016; 16:106; N=22
bit.ly/BA2-Transmasculine

Transgender Women and Lactation



Case report: transgender woman induced lactation for baby born to partner, exclusively nursed for 6 weeks

Spent 6 years on hormone therapy, grew mammary tissue

Reisman & Goldstein. *Transgender Health* 2018; 3(1): 24-26

Co-Nursing

Cisgender, same-sex female partners

- Both give birth
- One gives birth, other induces or relactates
- Neither give birth, both induce or relactate


Transgender men and women

Birthing mothers and fathers



sweetpeabreastfeeding.com

Co-Nursing: Balancing Milk Production



Discuss goals

- Exclusive or partial human-milk-feeding
- Desire to nurse
- Equal co-parenting

Is one partner's milk production a higher priority?

- Birthing parent
- Stay-at-home parent
- Neither, equal priority

Wilson, et al. *J Hum Lact* 2015; 31(1), 64-67




Research and Practice

Early Formula and Allergy Sensitization

Retrospective Irish study compared 55 nursing babies who developed cow-milk-protein allergy (CMPA) with 55 matched milk-tolerant controls


- Babies fed formula in 1st 24 hours **16x more likely** to develop CMPA than those exclusively nursed
- 76% diagnostic accuracy



Kelly, et al. *Pediatr Allerg Immunol* 2019; 30(8):810-16; doi: 10.1111/pai.13108

Early Term Birth and Nursing Outcomes

Born 2-3 weeks early (37-38 weeks gestation)




Nursing at 1 month:

- 76% term
- 73% early term
- 57% late preterm

Hackman, et al. *Breastfeed Med* 2016; 11:119-25; US prospective interview study, N=2,772

Early Term Birth and Nursing Outcomes

Gestational Age at Birth	Exclusive Nursing During Hospital Stay
41+ weeks	57%
40 weeks	55%
39 weeks	42%
38 weeks	36%
37 weeks	35%



Keenan-Devlin, et al. *Mat Child Health J* 2019; DOI: 10.1007/s10995-019-02787-4; US 743 geographically & ethnically diverse families

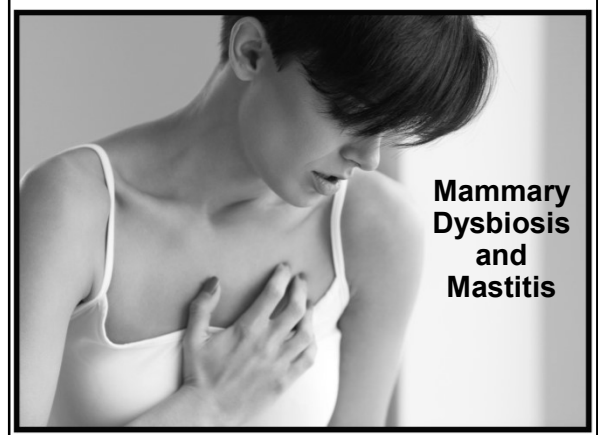
Early Term Birth and Outcomes



Significantly fewer early term babies

- Nursed during 1st hour
- Exclusively nursed in hospital
- Were exclusively nursing at 1 month

Noble, et al. *Breastfeeding Medicine* 2019; . DOI:10.1089/bfm.2018.0260; US prospective cohort study, 358 early term

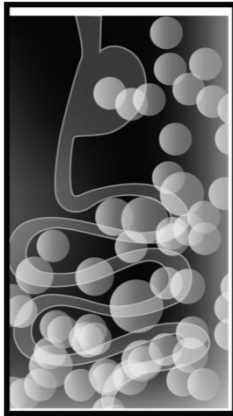


Mammary Dysbiosis and Mastitis

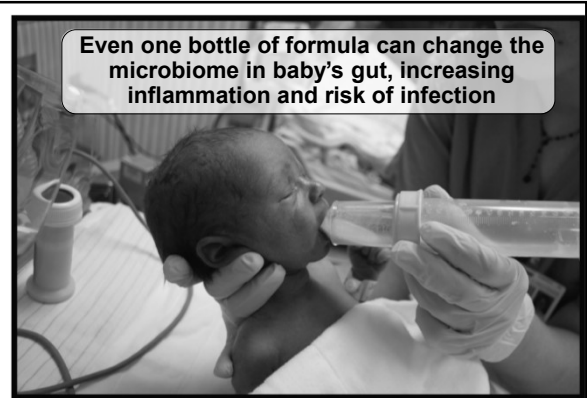
Microbiome

Interactions of microorganisms (bacteria, fungi, and viruses) with the host body

Exist in the gut, milk, and mammary gland



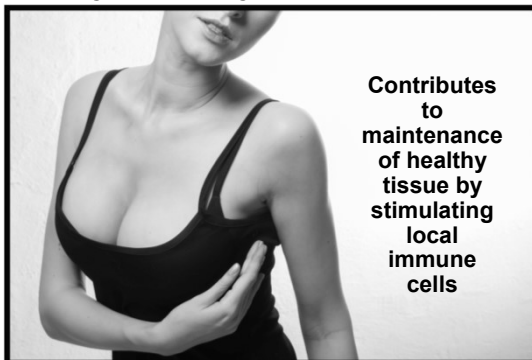
Mitchell, et al. *J Hum Lact* 2019; doi:10.1177/0890334419862214



Even one bottle of formula can change the microbiome in baby's gut, increasing inflammation and risk of infection

Moodley-Govender, et al. *Breastfeed Med* 2015; 10(10):488-92

Healthy Mammary Microbiome



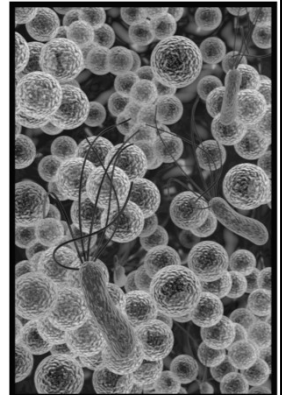
Contributes to maintenance of healthy tissue by stimulating local immune cells

Xuan, et al. *PLoS ONE* 2014; 9(1):e83744

Mammary Dysbiosis

Occurs when population of unhealthy organisms in the mammary microbiome increases at the expense of healthy organisms

Increased risk of pain, inflammation, infection



Berens, et al. *Breastfeed Med* 2016; 11(2):46-53

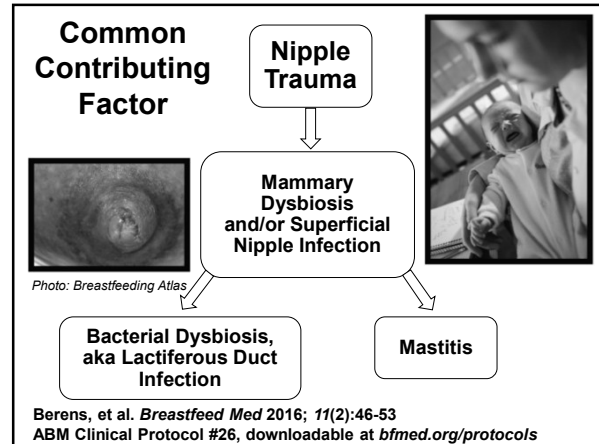


Contributing Factors

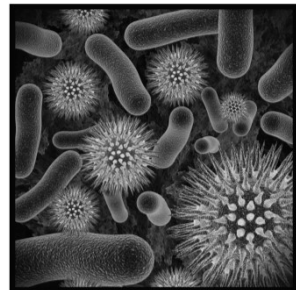
Milk components, blood type, stress, fatigue

Receiving antibiotics during the last trimester of pregnancy increased risk of mastitis 25-fold

Angelopoulou, et al. *Med Microbiol Immunol* 2018; 207(2):83-94
Bergmann, et al. *Br J Nutr* 2014; 112(7):1119-28



Bacterial Dysbiosis, aka Lactiferous Duct Infection



“Bacterial overgrowth combined with biofilm formed by bacteria (possibly in conjunction with Candida sp) may lead to narrowed lactiferous ducts and inflamed epithelium.”

Berens, et al. *Breastfeed Med* 2016; 11(2):46-53; ABM Protocol #26



Chart review of 64 mothers over 5 yr with chronic breast &/or nipple pain, not mastitis


Symptoms

- Chronic nipple lesions that don't heal
- Deep breast pain
- Tender breasts

Eglash, et al. *J Hum Lact* 2006; 22(4):429-33

Antibiotics taken 3-6 wk; choice based on allergy, frequency preference, milk culture results & cost

Average duration of treatment: 5.7 wk with a pain resolution rate of 94%



Eglash, et al. *J Hum Lact* 2006; 22(4):429-33

Mastitis Terminology

Subclinical

- No symptoms, changes in milk composition

Subacute


- Symptoms but no fever, body aches

Acute

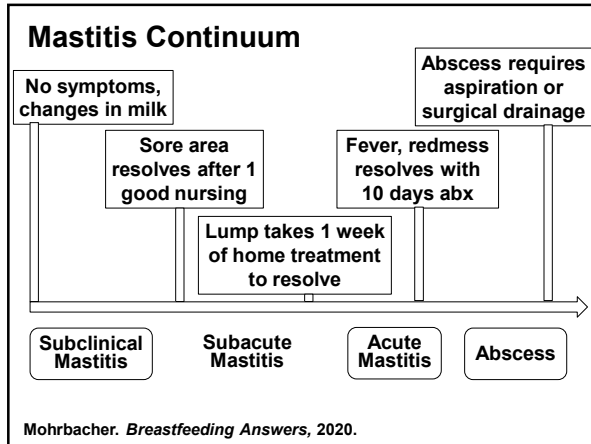
- Symptoms with fever, body aches

Abscess

- Walled-off area of pus



Baeza. *Clinical Lactation* 2016; 7(1):7-10



Mastitis and the Microbiome

Bacterial balance in human milk changes markedly during mastitis

Probiotics: Bacteria predominant in a healthy microbiome

Prebiotics: Food consumed by healthy bacteria

Jimenez, et al. *J Hum Lact* 2015; 31(3):406-15

Mastitis may be prevented and treated with specific strains of bacteria predominant in healthy mammary and milk microbiomes

Hurtado, et al. *Breastfeed Med* 2017; 12(4):202-09
 Arroyo, et al. *Clin Infect Dis* 2010; 50(12):1551-58

Novel Mastitis Treatments

Treatment	Specifics	When to Use
Probiotics	Specific strains, doses of probiotics; to prevent, daily from 30 wk of pregnancy (<i>L. salivarius</i> PS2, 9 log10CFU); to treat, daily after birth (<i>L. fermentum</i> CECT5716, 9 log10CFU) as a treatment	To prevent mastitis, as home treatment, or as an alternative or complement to antibiotics
Bacteriocins	<i>L. lactis</i> ES1515—Apply 0.1 mL after nursing for 14 days	As an alternative or complement to abx
Curcumin Cream	Curcumin cream 200 mg-- Apply to gland tid for 3 days	For inflammation and breast pain

Walker. *Clinical Lactation* 2018; 9(3):130-36

Evidence-Based Marketing?


Spanish researchers own the patents to these commercial probiotic products

- Lactanza hereditum (Angelini, Barcelona, Spain)
- Qiara (Puremedic, Kew, Victoria, Australia)
- Target b2 (Klaire Labs, Reno, NV USA)

Amir, et a. *Int Breastfeed J* 2016; 11:19

Picture-Based Tongue Assessment Tools

Photo: Dr. Gina Weissman, used with permission



Picture-based tongue assessment tools developed in Brazil and the U.K. for international use

Goal: To identify babies with symptomatic tongue-tie

Photo: Dr. Gina Weissman, used with permission
Power, RF & Murphy, JF. Arch Dis Child 2015; 100(5):489-94

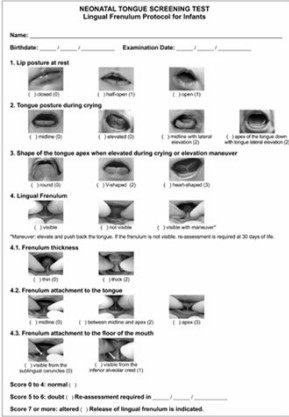
Neonatal Tongue Screening Test (NTST)

Mandated by law in Brazil to evaluate every newborn

Martinelli, et al. *Revista Cefac* 2016; 18(6):1323-31

Identified same 14 of 449 babies as Bristol Tongue Assessment Tool (BTAT)

Lima, et al. *J Pediatr (Rio J)* 2019; doi:10.1016/j.jpeds.2018.12.013



Tongue-Tie and Breastfed Babies (TABBY) Tool

Developed, studied in Bristol, U.K.

98% agreement among 5 midwives on 262 babies, easy to use



Ingram, et al. *Int Breastfeed J* 2019; 14:31

TABBY Tongue Assessment Tool

	0	1	2	SCORE
What does the tongue-tip look like?				
Where is it fixed to the gum?				
How high can it lift (wide open mouth)?				
How far can it stick out?				

© University of Bristol Design and Illustration: Hanna Oakes | oah@bristol.ac.uk

Ingram, et al. Int Breastfeed J 2019; 14:31; score ≤5 impairment



Jaundice


Newborn Jaundice

- **Normal newborn jaundice**
 - Skin takes on yellow color from yellow pigment—bilirubin—in blood
 - By-product of breakdown of red blood cells
- **>80% newborns jaundiced because they:**
 - Make more bilirubin
 - Process it slowly
 - Absorb it more easily through the gut
- **Levels <20 mg/dL (term) may benefit**
- **Too high, can cause brain damage, death**

Bilirubin exits baby's body via stools & colostrum is a laxative so we thought

With more early breastfeedings:		With fewer early breastfeedings:	
Stools	• ↑ bilirubin-rich stools passed	Stools	• ↓ bilirubin-rich stools passed
Gut	• ↓ bilirubin reabsorbed	Gut	• ↑ bilirubin reabsorbed
Milk	• ↑ milk • ↓ engorgement • ↓ weight loss	Milk	• ↓ milk • ↑ engorgement • ↑ weight loss
Outcome	• ↓ newborns with exaggerated jaundice	Outcome	• ↑ newborns with exaggerated jaundice

Bilirubin Levels and Stools?



1st 4 days, collected all stools from term, healthy newborns


- 33 nursing
- 27 formula-fed had fewer stools, lower bilirubin levels

Not lack of stools, but inadequate milk intake that contributes to high bilirubin levels

Buiter, et al. *Eur J Pediatr* 2008; 167(5):501-07


Jaundice and Breastfeeds Per Day

Breastfeeds Per Day Birth - Day 4	Bilirubin Level (mg/dL)
11	1-12
10	12-16
9	16-20
7.5	≥20



Babies <20 mg/dL lost a smaller percentage of birth weight

Boskabadi, et al. *J Mat Fetal Neonat Med* 2017; 31-4:457-63; N=634



ABM Clinical Protocol #22 called the most common type of exaggerated newborn jaundice from underfeeding "suboptimal intake jaundice"


Flaherman, et al. *Breastfeed Med* 2017; 12(5):250-57; bfmed.org/protocols

Jaundice in Low-Resource Settings

In some areas, high-tech equipment for assessing and treating newborn jaundice are unavailable


As a result, death and disability from jaundice are common

Low-cost, low-tech tools save lives



Lee, et al. *Pediatrics* 2019; 143(5) bit.ly/BA2-BiliRuler

Filtered Sunlight Canopies



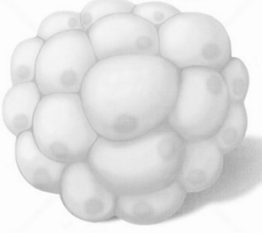
Slusher, et al. *NEJM* 2015; 373(12):1115-24 bit.ly/BA2-NEJM




Obesity: Physical Factors

Adipose (fatty) tissue, immune system organ

- Secretes estrogen
- Increases secretion of cortisol and androgens
- Source of inflammatory signals known to contribute to insulin resistance, metabolic syndrome



Obesity: Physical Factors



Parents' ability to act on their intention to breastfeed may be affected by medical consequences of obesity

Obesity: Related Medical Conditions

Obese parents at higher risk of

- Gestational and Type 2 diabetes
- Polycystic ovary syndrome
- Urinary tract infection, preterm labor
- Birth complications:
 - Induction of labor
 - Elective cesarean
 - Wound infection
 - Preeclampsia



Obesity: Delayed Milk Increase

Association between high prepregnancy BMI and delay in milk increase after birth

- 46% BMI \leq 30
- 58% BMI >30

Preusting, et al. *J Hum Lact* 2017; 33(4):684-91

But those with high BMIs also less likely to nurse during 1st 2 hours

Kair & Colaizy. *Mat Child Health J* 2016; 20(3):593-601




Obesity: Prolactin Response

Older study found prolactin response to baby's sucking lower among obese women

Rasmussen & Kjøhede. *Pediatrics* 2004; 113(5):e465-71

After birth, prolactin levels were comparable, but during 1st week, prolactin surges lower in those with high BMIs



Follin, *Clin Endocrinol (Oxford)* 2013; 79(1):71-78

More Medically Indicated Formula Use

Exclusive nursing in BFHI hospital

- 70% among obese
- 84% among normal-weight women

After adjusting for related medical conditions, obesity accounted for 36% of medically indicated formula use

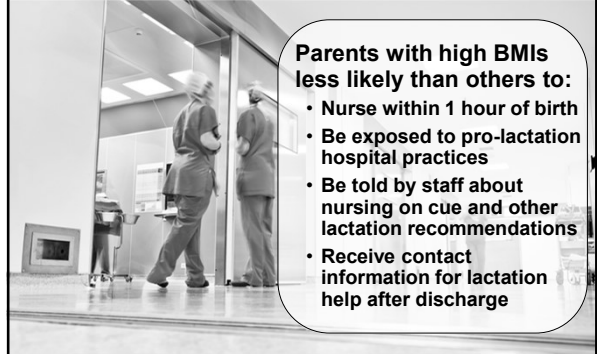


Colling, et al. *Breastfeed Med* 2019; 14(4):236-42; N=1,245; 41% obese

Obesity: Cultural Discrimination?

Parents with high BMIs less likely than others to:

- Nurse within 1 hour of birth
- Be exposed to pro-lactation hospital practices
- Be told by staff about nursing on cue and other lactation recommendations
- Receive contact information for lactation help after discharge



Kair & Colaizy. *Mat Child Health J* 2016; 20(3):593-601; N=19,145; 3,717 obese

Obesity: Cultural Discrimination?



During in-depth interviews 34 clinicians felt

- Helping obese parents nurse more physically challenging and time-consuming
- Obese parents more likely to have nursing problems

Garner, et al. *Breastfeed Med* 2014; 9(10):503-09

Lactation assessment tools (LATCH) not as reliable in obese parents
Chapman, et al. *J Hum Lact* 2016; 32(2):269-76

Obesity: More Nursing Problems?

Not necessarily. Israeli study of 109 women divided into 4 groups by BMI

- Higher BMI: larger glands/nipples
- Latching struggles same (15.5%) in all 4 groups

Mangel, et al. *Breastfeed Med* 2019; 14(5):342-46

Australian study found no difference in nursing problems during 1st 4 mo



Mallan, et al. *BMC Pregnancy Childbirth* 2018; 18(1):461; N=477

Support of HCPs Matters



Among obese women, lactation support from MD or non-MD provider associated with an increase of:

- 8% initiating nursing
- 9% had more knowledge about lactation recommendations
- 19% nursing \geq 6 mo

Jarlenski, et al. *Womens Health Issues* 2014; 24(6):641-48

Obesity: Social-Emotional Factors



Major barrier to meeting feeding goals: reluctance to nurse in front of others, even at home

May be one reason fewer high BMI parents initiate nursing

McKenzie, et al. *J Hum Lact* 2018; 34(4):760-67



Clinical Skills



New Role for Hand Expression

Safe to learn and practice hand expression during last month of low-risk pregnancy

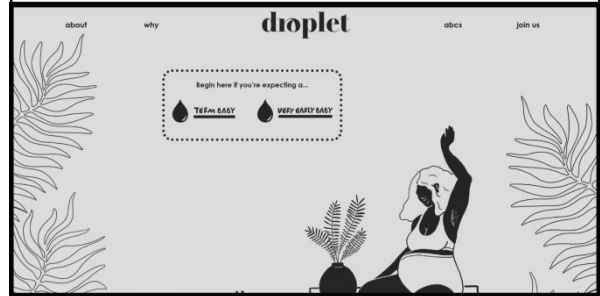
DAME RCT followed 635 women with gestational diabetes

Found no risk of complications



Forster, et al. *Lancet* 2017; 389(10085):2204-13

firstdroplets.com



Morton. *Breastfeed Med* 2019; 14(5):295-97

firstdroplets.com



Last 4 weeks of pregnancy, 1-2x/day express milk

Goals to:

- Learn this skill before birth
- Collect and store milk to use as a supplement, if needed

Morton. *Breastfeed Med* 2019; 14(5):295-97

firstdroplets.com

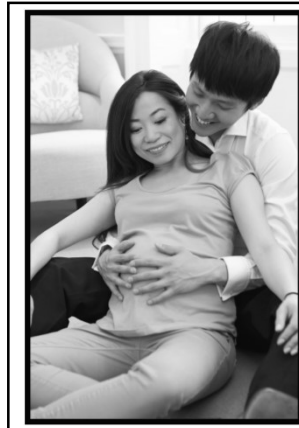
After birth, follow nursing by hand-expressing milk into spoon, feed baby this "dessert"

Goals to prevent:

- Excess weight loss
- Exaggerated jaundice
- Delayed milk production

Morton. *Breastfeed Med* 2019; 14(5):295-97

Photo: *firstdroplets.com*



Those who hand-expressed during pregnancy

- Felt more confident they could exclusively nurse
Casey, et al. *Aust N Z J Obstet Gynaecol* 2019; 59(6):811-18
- After birth, they supplemented less with formula
Demirci, et al. *Mat Child Nutr* 2019; 15(4):e12824



Massage and Manual Therapy

Some cultures believe massage essential to lactation after birth

Systematic review found 10 different massage techniques used to treat:

- Engorgement
- Plugged ducts/mastitis
- Mammary pain
- Milk ejection

Sadovnikova, et al. *Breastfeed Med* 2015; 10(S1):S17

Massage and Manual Therapy

Effective techniques for solving lactation challenges based on traditional practices

- Russian breast massage (TBML)
Witt, et al. *J Hum Lact* 2016; 32(1): 123-31
bit.ly/BA2-BolmanMassage
- Chinese manual therapy
Zhao, *J Hum Lact* 2014; 30(3):324-30

Modern Application of Ancient Wisdom
Traditional Chinese Medicine

Chinese manual therapy can treat:

- Engorgement, mastitis
- Pain: head, breast, chest
- Low milk production

Therapy involves gentle stimulation of acupoints (Both Hands, Ten Fingers and Love, BHTFL)

Di, Huimin (Daphne). *New Therapies for the Breastfeeding Mother*. Beijing: China Labor & Social Security Press, 2012

RCT of 60 lactating women with low milk production


- 1 group stimulated acupressure points while pumping
- Other group didn't

Acupressure group pumped significantly more milk

Esfahani, et al. *Iran J Nurs Midwif Res* 2015; 20(1):7



Milk Production Misconceptions



12 focus groups to understand reasons nursing mothers give early formula


“Perceived insufficient milk:” unfamiliar with newborn/lactation norms

No clue their actions affect milk production

DaMota, et al. *J Hum Lact* 2012; 28(4):476-82; N=97 WIC clients


More feeds/day boost prolactin and milk levels

Upregulation of prolactin receptors: Key during first 2 weeks



de Carvalho. *Pediatrics* 1983; 72:307-31

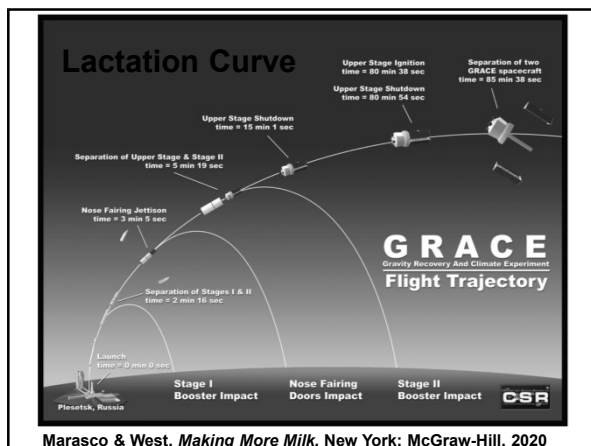
2 Basic Milk Production Dynamics



#1 Degree of fullness: Drained glands make milk faster, full glands make milk slower

#2 Storage capacity

Daly, et al. *Exp Physiol* 1996; 81:861-75



Boeing Starliner Failure

December 20, 2019

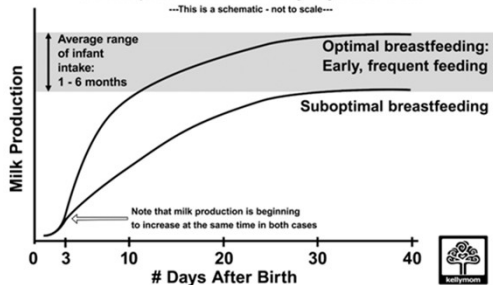
Goal: Dock with the International Space Station

Never reached orbit due to programming errors



Early, Often, Effective Nursing

An example of the effect of early, frequent breastfeeding on milk production in the early days after birth
---This is a schematic - not to scale---



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 - Tongue-tie
 - Jaundice
 - Obesity
- Clinical skills
 - Manual
 - Lactation curve



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Questions?

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