



Breastfeeding for the Future Physician

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BREASTFEEDING & LACTATION MEDICINE

LACTATIONMD, LOMBARD, IL

Our Goals

- Learn how personal experiences affect patient care
- Review benefits and risks of infant feeding choices
- Understand the physiology of lactation
- Counsel mothers on infant feeding choice
- Discuss how society and culture affect breastfeeding practices
- Troubleshoot mothers' common concerns
- Discern when to refer
- Evaluate safety of medications during lactation
- Learn when breastfeeding is truly contraindicated
- Assist mothers in the weaning process

According to the AAFP...

- ▶ “Breastfeeding is the physiological norm for both mothers and their children. **Breastmilk offers medical and psychological benefits not available from human milk substitutes**...Family physicians should have the knowledge to promote, protect, and support breastfeeding. .”

<http://www.aafp.org/about/policies/all/breastfeeding.html>



Physician Mothers' Experiences

- Physician mothers (PM) who actively promoted breastfeeding had significantly longer personal breastfeeding duration compared with PM who denied actively promoting breastfeeding.
- Only 60% of PM who desired to breastfeed for 12 months were able to do so.
- In 43% of cases, breastfeeding cessation was due to demands of work.



Sattari, M., Levine, D., Neal, D., & Serwint, J. R. (2013). Personal breastfeeding behavior of physician mothers is associated with their clinical breastfeeding advocacy. *Breastfeeding Medicine*, 8(1), 31-37.

Second Infant Feeding Practices Survey

If the doctor advised...

- Breastfeeding only – 5% of mothers didn't breastfeed.
- Formula only – 88% didn't breastfeed.
- Both – 18% didn't breastfeed.
- No opinion or didn't know – 20% didn't breastfeed.

**Decision not to BF =
Infant's doctor >
Infant's father >
Mother's doctor >
Maternal grandmother >
Paternal grandmother.**

Odom, E. C. et al. (2014). Association of family and health care provider opinion on infant feeding with mother's breastfeeding decision. J. Acad. Nutr. Diet. 114(8), 1203-7.

Understanding your values

- How do you feel about your patients choosing to
 - breastfeed?
 - feed expressed breastmilk?
 - formula feed?
 - mix formula and breastfeeding/breastmilk?
- How do you feel about your patients choosing to nurse
 - for 1 week?
 - for 3 months?
 - for 2 years or longer?
- What are the reasons for your beliefs?

Table 1. Breastfeeding Definitions

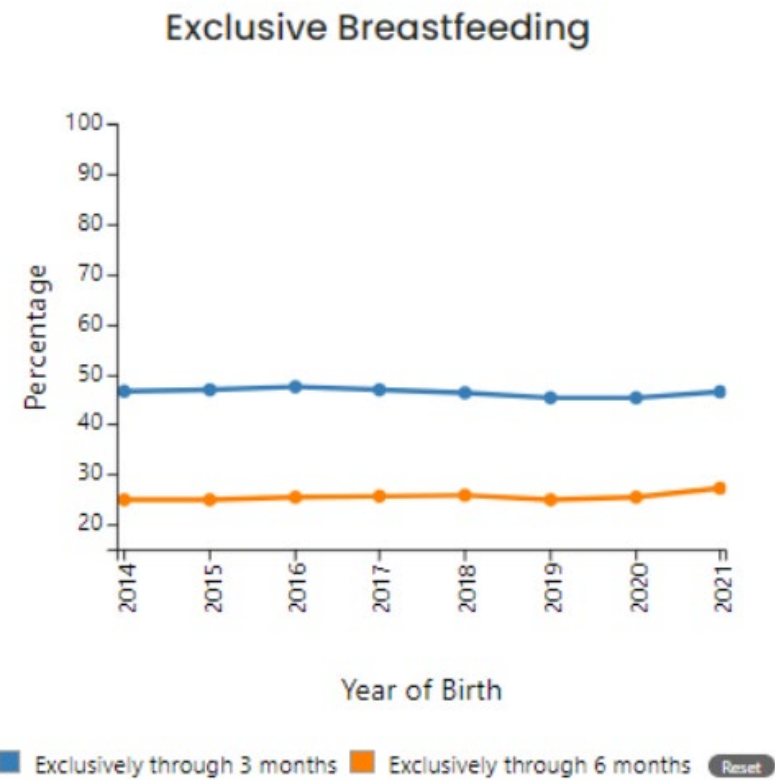
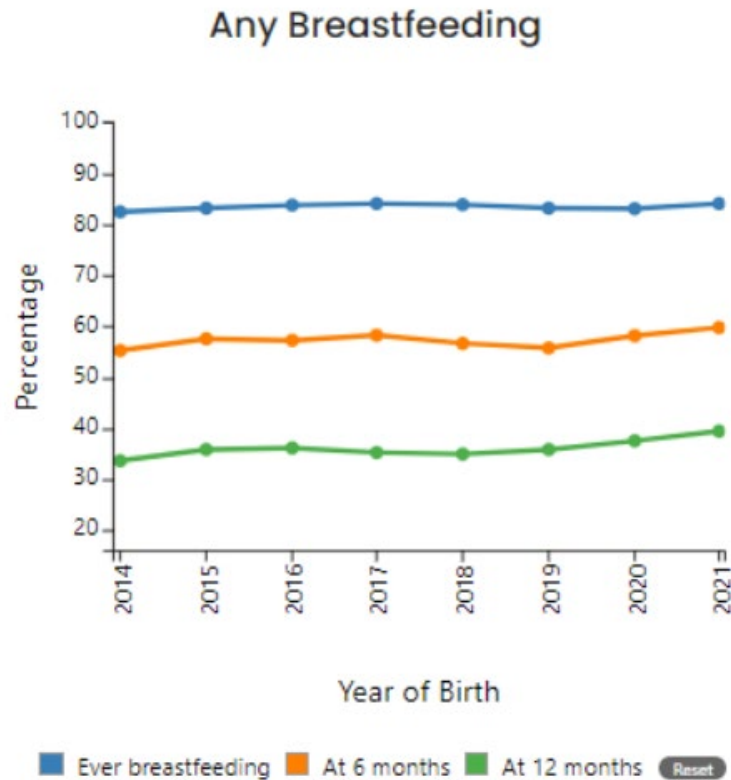
Any Breastfeeding

- Full Breastfeeding
 - Exclusive: Human milk only; no other nutrients, supplements, or liquids
 - Almost Exclusive: No milk other than human milk; minimal amounts of other substances provided infrequently
- Partial Breastfeeding
 - High Partial: Nearly all feedings are human milk ($\geq 80\%$)
 - Medium Partial: A moderate amount of feedings are human milk in combination with other nutrient foods and nonhuman milk (20% to 80% of nutritional intake is human milk)
 - Low Partial: Very few feedings are human milk ($<20\%$ of nutritional intake)
 - Token: Breastfeeding is primarily for comfort (minimal % of total nutritional intake)

Never Breastfed

- Infant has never ingested any human milk

US Breastfeeding rates by birth year



> [Pediatrics](#). 2025 Jan 1;155(1):e2024067139. doi: 10.1542/peds.2024-067139.

Breastfeeding Trends Following the US Infant Formula Shortage

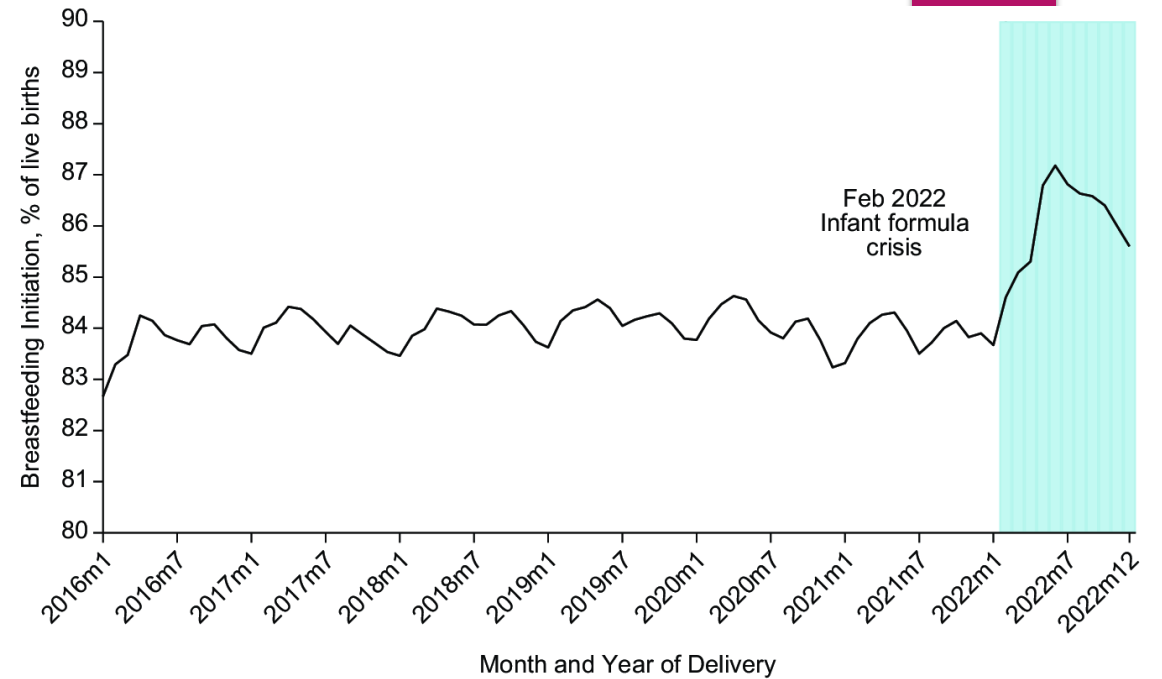
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Affiliations + expand

PMID: 39729396 DOI: [10.1542/peds.2024-067139](#)

Abstract

Objective: Breastfeeding enhances maternal and child health, yet US breastfeeding rates remain below optimal levels and substantial disparities persist. The 2022 infant formula crisis had the potential to influence infant feeding practices due to formula shortages and fears about the safety of formula feeding in the wake of recalls. This report studies the evolution of breastfeeding-initiation trends during the infant formula crisis and compares the effects across subpopulations.

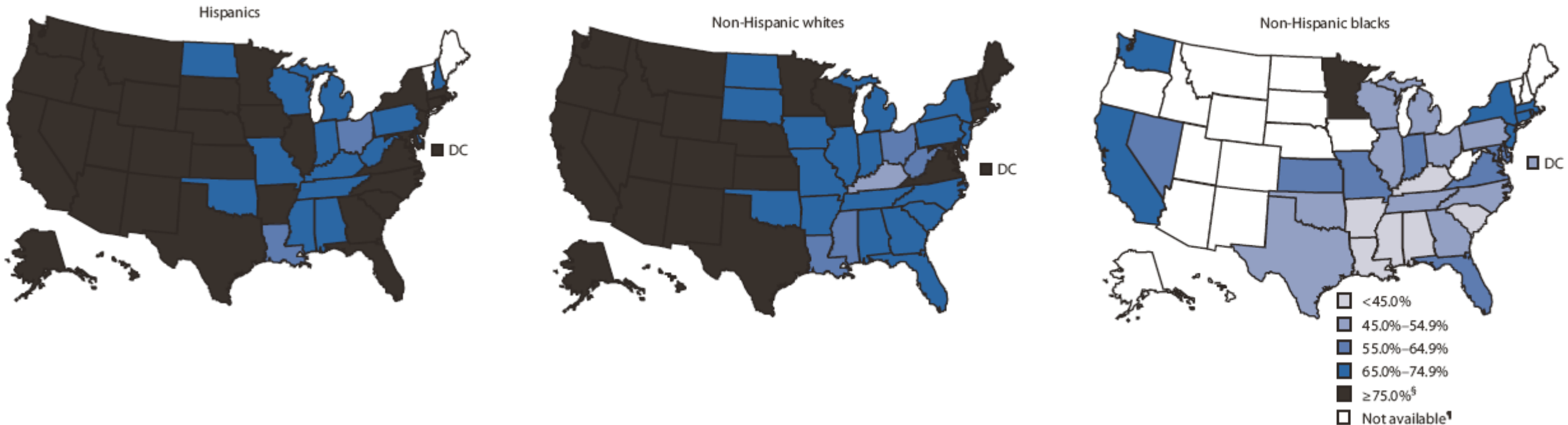


The Formula Effect

PEDIATRICS. 2024;155(1). DOI:10.1542/PEDS.2024-067139

Racial Differences in Breastfeeding Initiation

Prevalence of initiating breastfeeding by race, National Immunization Survey, 2004-200



<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5911a2.htm>

Burden of Suboptimal Breastfeeding

- ▶ If **90% of US families** complied with medical recommendations to breastfeed exclusively for 6 months:
 - The United States would save \$13 billion per year.
 - We would prevent 911 deaths, nearly all of which would be in infants.

Bartick, M., & Reinhold, A. The burden of suboptimal breastfeeding in the United States: a pediatric cost analysis. *Pediatrics*. 2010, 125(5), e1048-e1056.





How is breastmilk
made?

Lactogenesis Timeline

Stage I

Alveolar epithelial cells differentiate into lactocytes.

Stage II

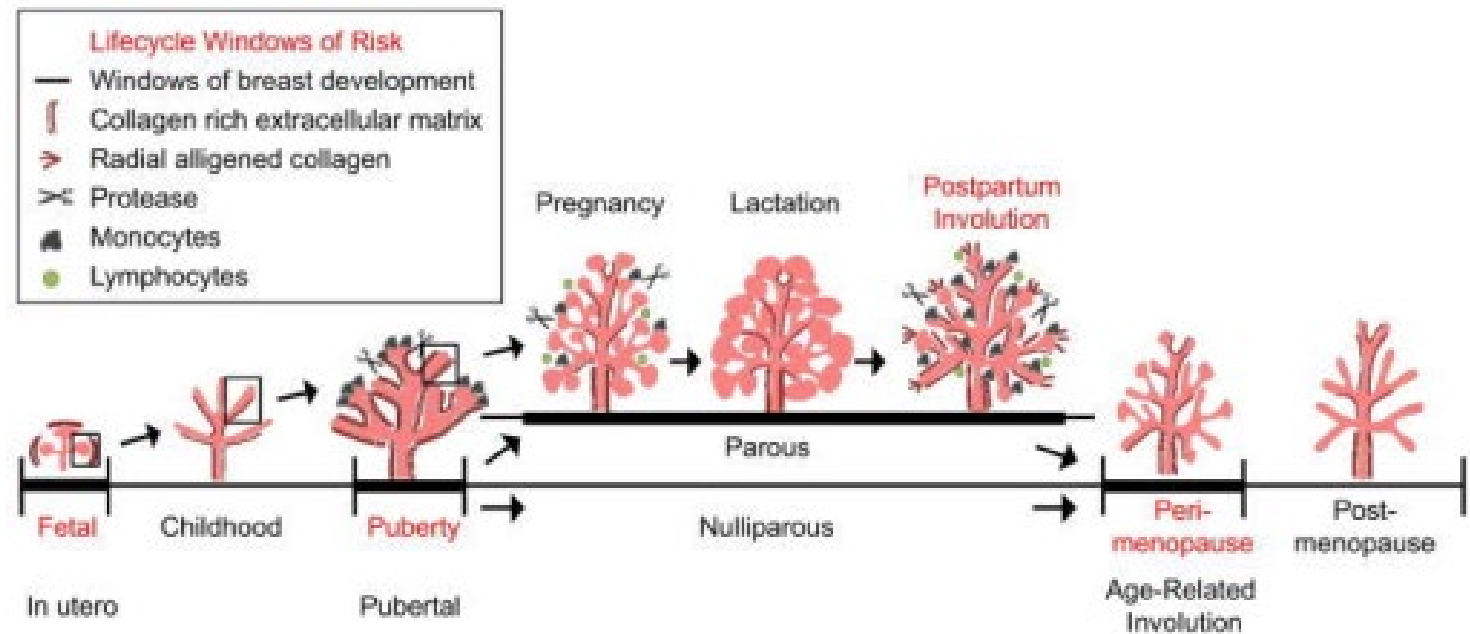
Copious milk production 2-3 days after withdrawal of placental progesterone

Stage III

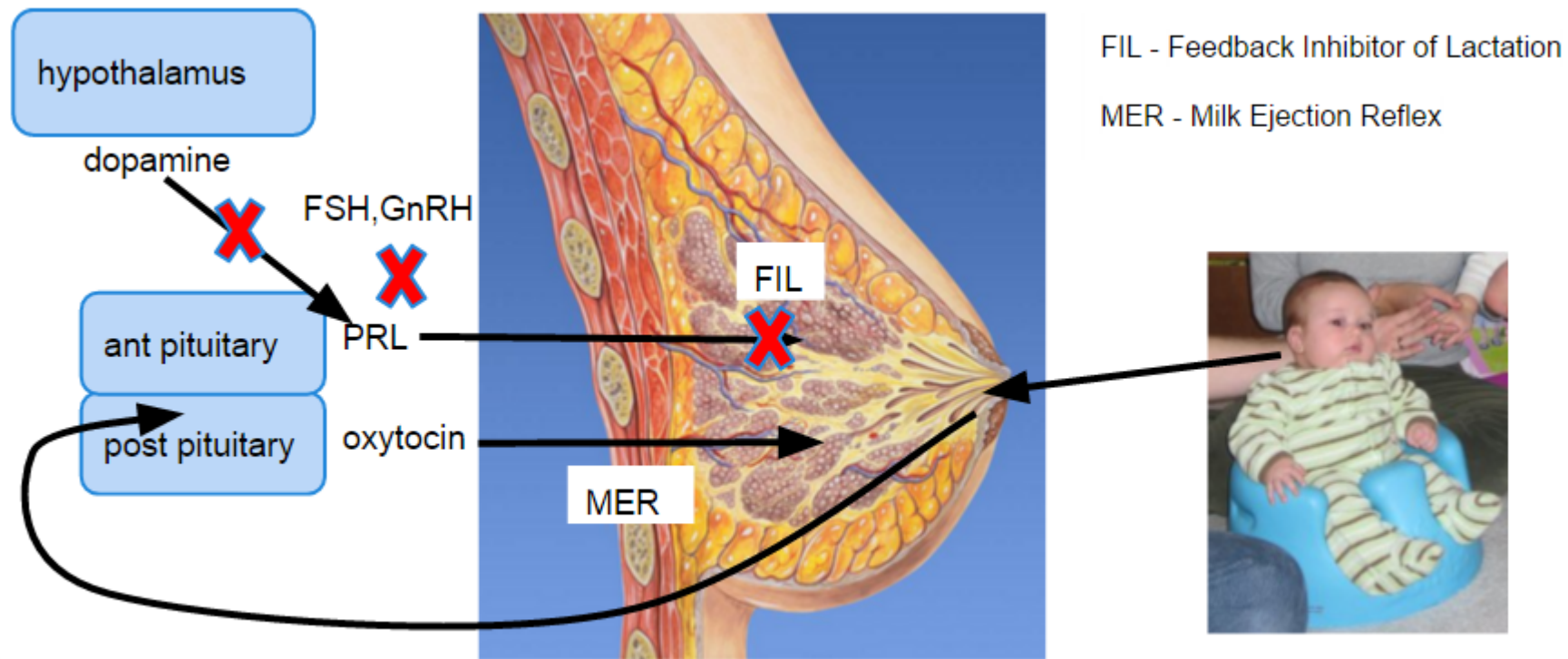
Prolactin maintains milk production, and oxytocin stimulates milk release

Involution

Massive cell death and tissue remodeling during weaning



Breast, Brain and Baby



Medical Illustrations by Patrick Lynch, generated for multimedia teaching projects by the Yale University School of Medicine, Center for Advanced Instructional Media, 1987-2000. Creative Commons Attribution 2.5 Generic License

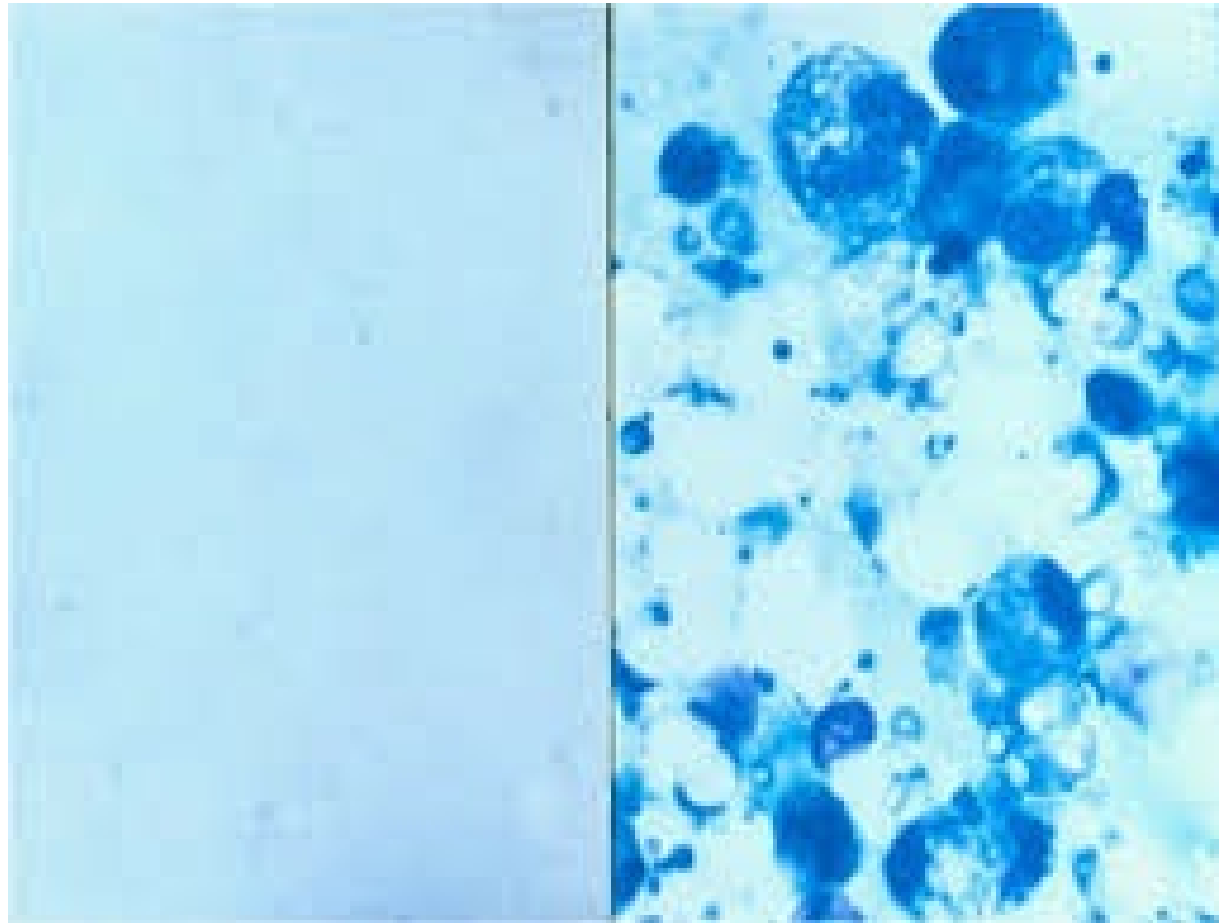
Table 2. Comparison of Human Milk, Cow Milk, and Infant Formula

Component	Human Milk	Similac®/Enfamil® Formulas	Cow Milk
Calories (kcal/L)	747	700	701
Protein (g/100 mL)	1.1	1.5	2.8
Casein	3.7		25.0
Taurine (mM/100 mL)	25 to 30	Added artificially	<1.0
Phenylalanine (mg/100 mL)	48	390 mM/100 mL	172
Tyrosine	61		179
Fat (g/1,000 mL)	4.5	2.6	4.4
Cholesterol (mg/L)	139	0	120
Carbohydrate (g/1,000 mL)	6.8	7.2	4.7
Minerals ash (weight %)	0.2	0.33	0.7
Calcium (mg/dL)	34	55	118
Phosphorus (mg/dL)	14	44	93
Calcium/phosphorus ratio	2.4:1	1.2:1	1.3:1
Sodium (g/L)	0.512 (7 mL Eq/L)	1.1 (6 mL Eq/L)	0.768 g/L
Vitamin D	4 to 40 IU/L	400 IU	47 to 100 IU
Vitamin K	0.9 to 6.9 mg/L	4 mg/100 kcal	19 mg/L

Similac® is a product of Abbot Laboratories, North Chicago, IL, Enfamil® is a product of Mead Johnson & Co, Evansville, IN.

Data from American Academy of Pediatrics. *Pediatric Nutrition Handbook*. 6th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009; Walker WA, Watkins JB. *Nutrition in Pediatrics*. Boston, MA: Little, Brown and Co; 1985; and Jensen RG. *Handbook of Milk Composition*. New York, NY: Academic Press; 1995.

Lawrence RM, Lawrence RA. Breastfeeding: more than just good nutrition. *Pediatr Rev*. 2011 Jul;32(7):267-80. doi: 10.1542/pir.32-7-267.

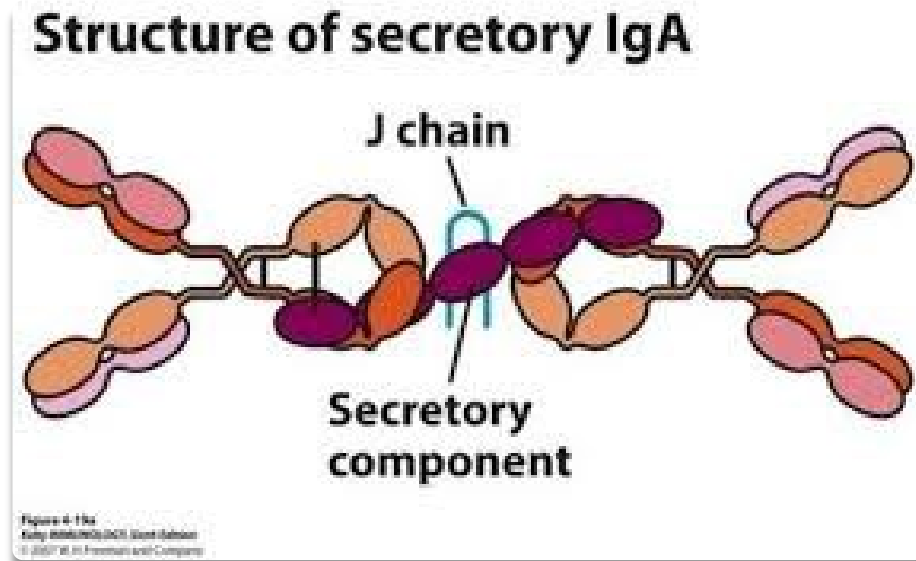


FORMULA

BREASTMILK

Figure 4.1 from Lawrence RA, Lawrence RM. Breastfeeding : A Guide for the Medical Profession. Elsevier; 2022.

What is unique to breastmilk?



- Cells: macrophages, stem cells
- Immunoglobulins: IgA/sIgA, IgG, IgM
- Growth Factors: EGF, HB-EGF, VEGF, NGF, IGF, erythropoietin
- Hormones: calcitonin, somatostatin
- Anti-microbial: lactoferrin, lactadherin/MFG E8
- Metabolic hormones: adiponectin, leptin, ghrelin
- Oligosaccharides & glycans: HMOS, gangliosides, glycosaminoglycans
- Cytokines: IL-6, 7, 8, 10, IFN γ , TGF β , TNF α
- Chemokines: G-CSF, MIF
- Cytokine Inhibitors: TNFRI and II
- Mucins: MUC1, MUC4



What are the benefits
of breastmilk?
For baby? For mother?

Benefits of Breastfeeding

Infants have decreased risk of

- Necrotizing enterocolitis (77%)
- Gastroenteritis (30%)
- Lower respiratory tract infection (19%)
- Otitis media (43%)
- Asthma (22%)
- Diabetes (type 1 - 57%, type 2 - 33%)
- SIDS (64%)
- Childhood overweight and obesity (31%)
- Leukemia (19%)

Mothers experience

- Decreased postpartum bleeding
- Lactational amenorrhea
- Increased weight loss (600 kcal/day).
- Decreased risk of breast/ovarian cancers.
- Decreased risk of cardiovascular disease
- Decreased risk of Type II Diabetes
- Reduced risk of osteoporosis

Contraindications to Breastfeeding

- Infant with galactosemia or maple syrup urine disease
- If the breastfeeding mother:
 - Has active untreated TB or brucellosis
 - Active HSV lesions on breast
 - Is infected with HTLV-1 or -2
 - Until 48 hrs old with Varicella (maternal sx 5 d PTD to 2 d PP)
 - Possibly CMV with preterm baby
 - Shared decision making with HIV/AIDS in industrialized country
 - <https://clinicalinfo.hiv.gov/en/guidelines/perinatal/counseling-and-managing-individuals-with-hiv-united-states-who-desire-breastfeed>

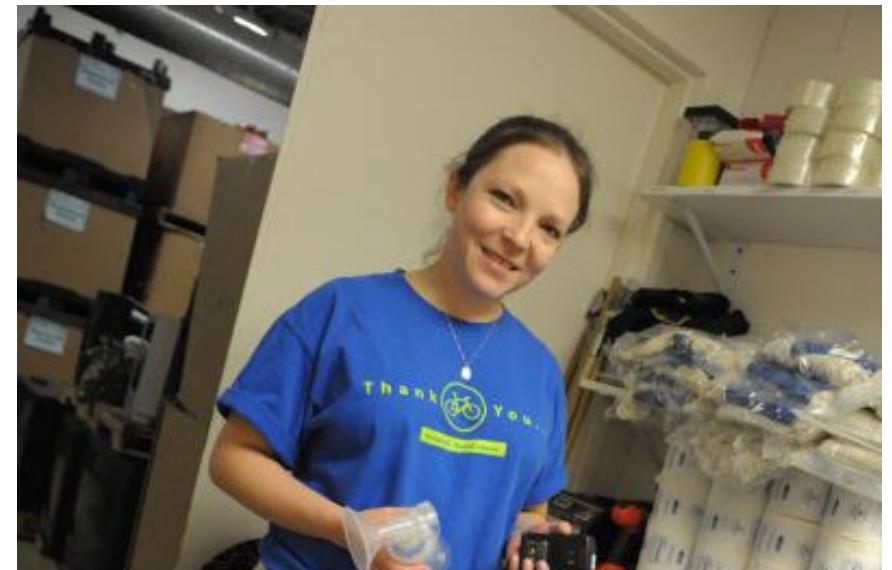
<https://publications.aap.org/pediatrics/article/150/1/e2022057988/188347/Policy-Statement-Breastfeeding-and-the-Use-of#14370864>

Case 1

- ▶ 25 year old G1P0 at 32 weeks is undecided about breastfeeding, but her partner is supportive. She will be returning to her full time retail job after 6 weeks of maternity leave.
- ▶ What are the challenges facing this patient?
- ▶ How would you counsel her?

Breastfeeding Mothers in the Workplace

- State and Federal laws support mothers taking breaks at work to pump.
 - Private insurances often cover the costs of a breast pump.
 - WIC provides breast pumps to enrolled mothers who forgo formula.
 - Employers can provide creative solutions to enable mothers to pump in a variety of work environments.
- <http://www.womenshealth.gov/breastfeeding/employer-solutions/index.php>



Pumping



How often should a mother pump once she returns to work?

- **Express milk approximately every three hours when separated.**
- Include morning (pre-work) and evening (post-work) expression sessions to keep supply high.
- Once the baby eats solids well, it may be possible to remove the least productive session.
- **Each session should empty the breasts, 15 minutes of pumping time (plus 10 minutes setup/cleanup).**

How much milk will the baby need each day?

- **From 6 weeks to 6 months, breastfed infants consume approximately 30 oz per day, or 1 oz per hour during separation.** This assumes the baby has free access to the breast during the evening and nights and will reverse cycle feed.

How should I package milk and store for future use?

- **Package milk for care providers in small bottles (2-3 oz).**
- **Freeze expressed breastmilk in 1 and 2 oz bags, clearly labeled with the date.**

Storage Duration of Fresh Human Milk for Use with Healthy Full Term Infants

Location	Temperature	Duration	Comments
Countertop, table	Room temperature (up to 77°F or 25°C)	6–8 hours	Containers should be covered and kept as cool as possible; covering the container with a cool towel may keep milk cooler.
Insulated cooler bag	5-39°F or -15-4°C	24 hours	Keep ice packs in contact with milk containers at all times, limit opening cooler bag.
Refrigerator	39°F or 4°C	5 days	Store milk in the back of the main body of the refrigerator.
Freezer			Store milk toward the back of the freezer, where temperature is most constant. Milk stored for longer durations in the ranges listed is safe, but some of the lipids in the milk undergo degradation resulting in lower quality.
Freezer compartment of a refrigerator	5°F or -15°C	2 weeks	
Freezer compartment of refrigerator with separate doors	0°F or -18°C	3–6 months	
Chest or upright deep freezer	-4°F or -20°C	6–12 months	

Reference: Academy of Breastfeeding Medicine. (2004) [Clinical Protocol Number #8: Human Milk Storage Information for Home Use for Healthy Full Term Infants \[PDF-125k\]](#) [↗](#). Princeton Junction, New Jersey: Academy of Breastfeeding Medicine. Available

https://www.cdc.gov/breastfeeding/breast-milk-preparation-and-storage/handling_breastmilk.html?CDC_AAref_Val=https://www.cdc.gov/breastfeeding/recommendations/handling_breastmilk.htm

Case 2

- ▶ 15 yr old G1P0 at 28wks thinks that breastfeeding is “gross.” Her mother and grandmother did not breastfeed, and the baby’s father is no longer involved. She plans to return to high school.
- ▶ What are the challenges facing this patient?
- ▶ How would you counsel her?

Prenatal Education/Patient Handouts

[Office on Women's Health](#)

[WIC Breastfeeding Support Learn Together Grow Together](#)

[University of North Carolina Ready, Set, Baby](#)

[Minnesota Breastfeeding Coalition](#)

[ABM Handouts](#)

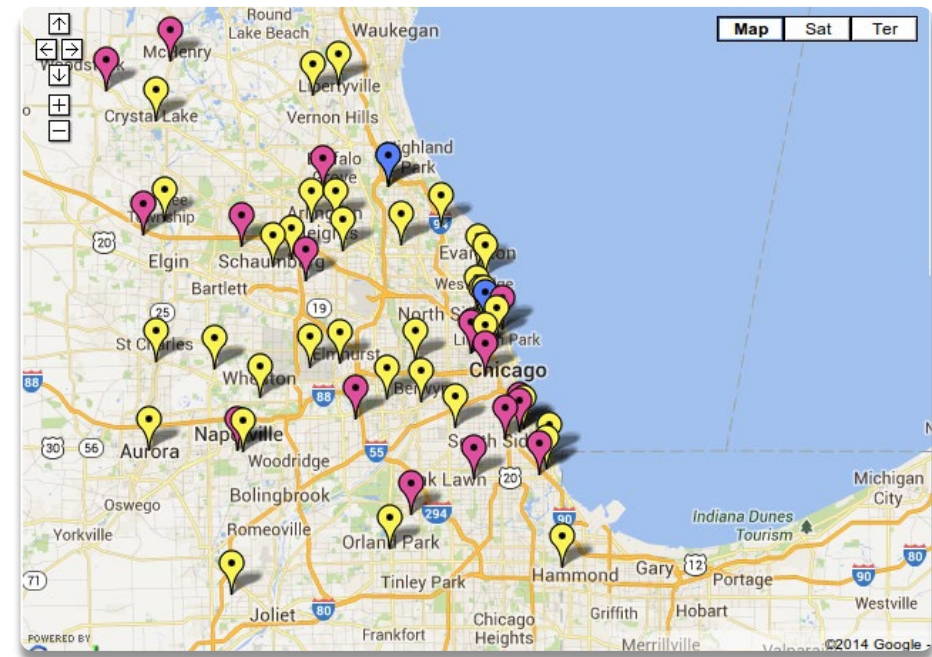
[IABLE Handouts](#)

[Milkworks Handouts](#)

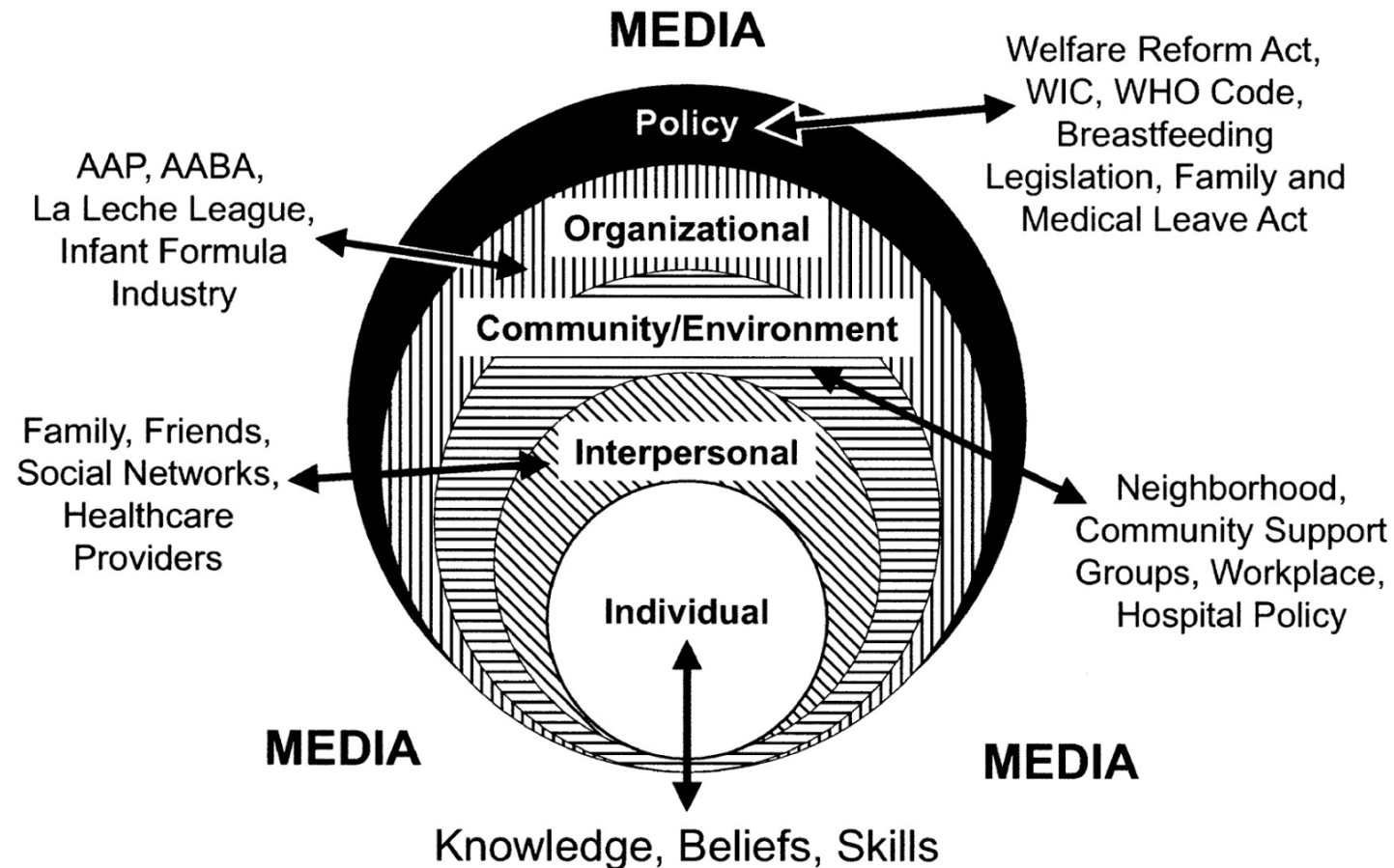
[WIC Handouts](#)

Finding Education/Support

- ▶ Breastfeeding Classes
- ▶ Support Groups
- ▶ Drop In Sessions
- ▶ Lactation Visits
- ▶ WIC Peer Counselors
- ▶ La Leche League
- ▶ Breastfeeding USA
- ▶ CLC – Certified Lactation Consultant
- ▶ IBCLC – International Board Certified Lactation Consultant
- ▶ NABBLM-C – North American Board of Breastfeeding and Lactation Medicine Certified Physician



Breastfeeding in Context

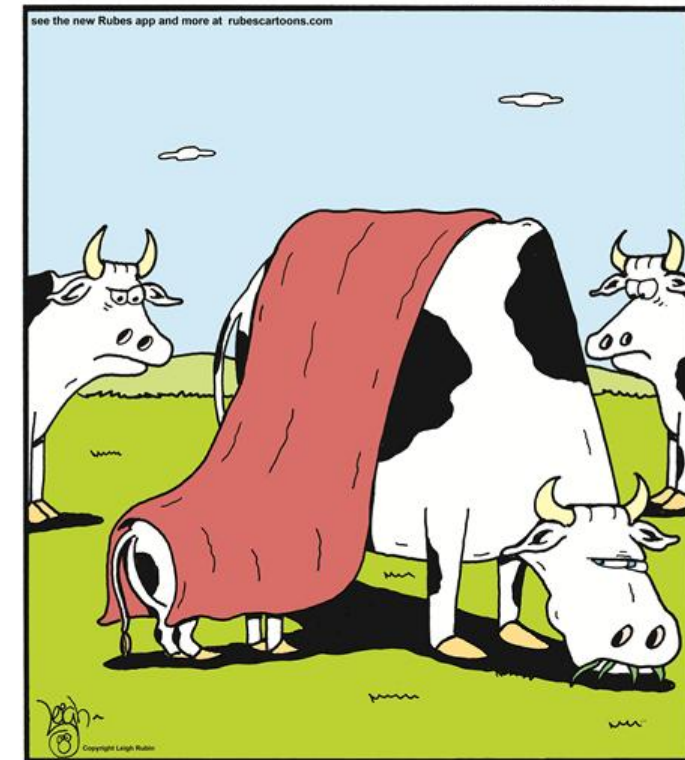


American Culture and Breastfeeding



RUBES™

By Leigh Rubin



Even when practiced discreetly, raised eyebrows and disapproving glances still meet with those who dare to udder-feed in public.

Mixed Messages



Fed is Best Movement

"As a mother and doctor whose child was seriously harmed by misinformation widely taught about breastfeeding,

**I WANT TO MAKE
SURE THAT NO BABY
IS HARMED BY
BREASTFEEDING
COMPLICATIONS**

by dispelling its myths with science and reason."

— Christie del Castillo-Hegyi, M.D.,
Co-Founder of the Fed is Best Foundation



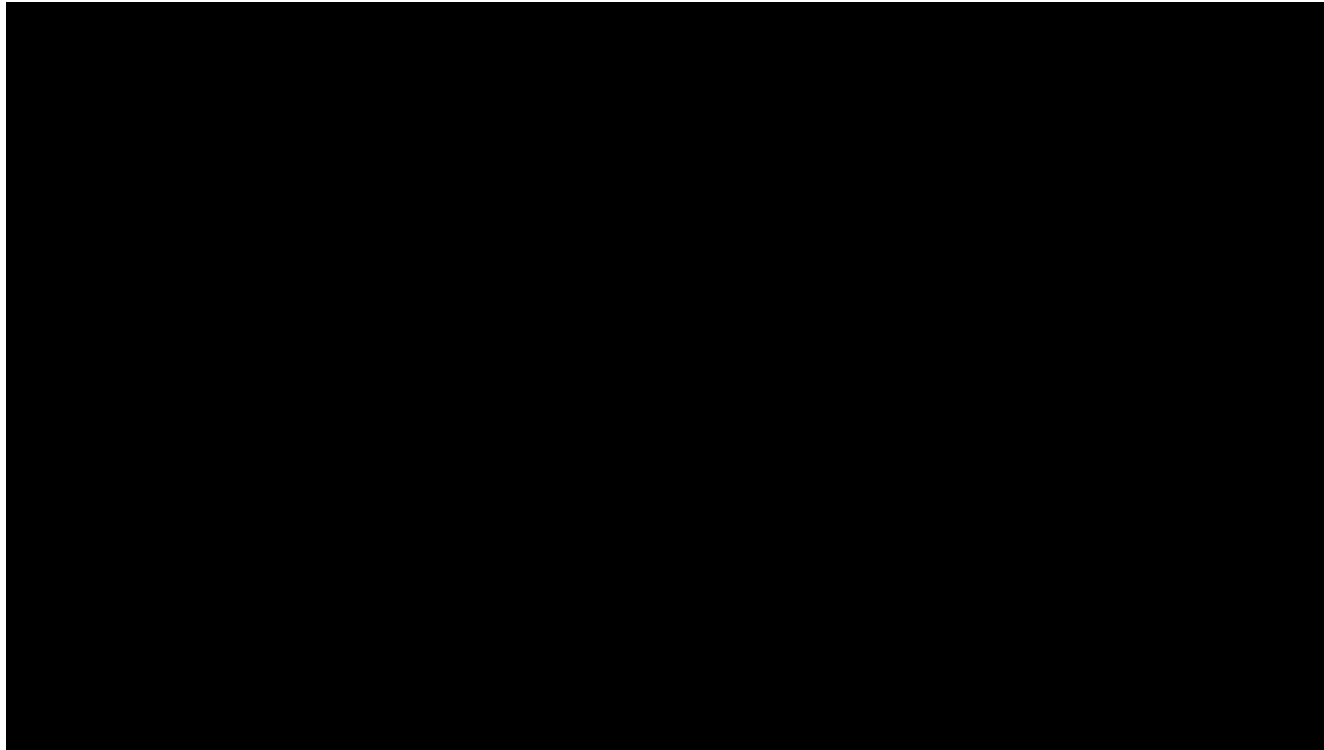
- > 7% birth wt or > 75th %ile of weight loss
<https://www.newbornweight.org/>
- Hyperbilirubinemia
- Hypoglycemia
- Hypernatremic dehydration

My milk finally came in at 9 weeks after passing retained placenta, which doubled my supply, and with it, my son quickly grew healthy and chubby. **I was able to breastfeed him exclusively until he was six months old**, then continued breastfeeding him until he was 20 months old.



Breastfeeding Management

Breast Crawl/Nipple Pain



<http://globalhealthmedia.org/portfolio-items/nipple-pain/?portfolioID=5623>

Latching and Positioning

MOTHER'S VIEW WHILE LATCHING BABY



baby's head tilted slightly back

bring baby in quickly

gently push with base of hand on shoulders

only chin and cheeks touch breast

baby's body close against mother

Move baby not breast

Below your breasts



Across your breasts



Supported at your side



Over your shoulder



FEEDING CUES

1. EARLY CUES: "I'm hungry"



Stirring



Mouth opening



Turning head
Seeking/rooting

2. MID CUES: "I'm really hungry"



Stretching



Increasing movement



Hand to mouth

3. LATE CUES: "Calm me, then feed me"



Crying



Lots of movement



Color turning red

CALM CRYING BABY
BEFORE FEEDING

Cuddling, Skin-to-skin on chest
Talking, Stroking



LOOK FOR EARLY
FEEDING CUES

Case 3

- ▶ 32 yr old G3P3 with 2 wk old infant who has not regained his birth weight successfully nursed her older children exclusively for 6 months each. She is having fever and chills, her nipples are sore and abraded, and her left breast is full, red, and tender. On physical exam, you observe the following:
- ▶ What is your diagnosis?
- ▶ How do you treat?



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Case 3 cont.



You recognize that the mother has mastitis.

- Breast tenderness, edema, or warmth
- Erythema, often in a wedge-shape
- Fever > 38.3 C (101 F) and malaise
- Pain or burning with breastfeeding

Diagnosis does not typically require cultures – most commonly *S. aureus*

Treatment

- Warm compresses, effective breastmilk removal, reverse pressure softening
- NSAIDs and antibiotic (dicloxacillin first line, then cephalexin or clindamycin)
- If no improvement in 48 hrs, consider MRSA and order breastmilk cultures

Case 3 cont.

- ▶ You suspect that given the mother's past breastfeeding success that the infant should also be evaluated. What will you do?
- Observe the infant nursing (look & listen)
- Examine the infant's mouth
- Ask about the health history of child (diaper output)

Case 3 cont.

- ▶ The infant was full term with apgars of 9 and 9. All newborn screenings were normal. He appears to have a shallow latch at the breast. With each suck, the infant makes a clicking noise. Inspection of his mouth yields this:
- ▶ What is your diagnosis?
- ▶ How do you treat?



Case 3 cont.

You recognize that the infant has ankyloglossia and recommend a frenotomy.



You refer the mother to a lactation consultant to begin a pumping/hand expression regimen to protect her milk supply.



You counsel the mother to begin bottle feeding expressed breastmilk to the infant and to follow up with you in two days for an infant weight check.

Common Concerns

Sore nipples

Nursing
Frequency

Low milk supply

- Maternal perceptions
- Galactagogues

Oversupply &
Engorgement

Plugged Ducts
& Mastitis

Special Circumstances



Inverted, flat, or very
large nipples



Ankyloglossia/tight
labial frenulum



Down Syndrome



Cleft lip/palate



Failure to Thrive



Prematurity



Dysfunctional suck



Recurrent plugged
ducts/mastitis/breast
abscess

Indications for Prenatal Referral

- Maternal History of:
 - Low milk production
 - Breast reduction surgery
 - Breast irradiation
 - Hormonal Infertility
 - Insulin resistance/Diabetes
 - Dopamine antagonist use (e.g. cabergoline, aripiprazole)
 - HIV infection
 - Chronic conditions which could impact lactation (e.g. pituitary disorder, spinal cord injury, nipple or breast deformities)



What about
medications and
breastfeeding?

Case 4

- ▶ **31 yo G1P1001** is 6 weeks postpartum after a normal spontaneous vaginal delivery presents with the complaint of frequency and urgency of urination for one day. She denies hematuria, fever, flank pain, and changes in vaginal discharge. She has a history of two prior UTIs (most recently four years ago) which were treated with a single course of an antibiotic. The patient's postpartum lochia (bleeding) has ceased and her menses have not resumed. She is sexually active with her husband and they use condoms consistently for contraception. She does not desire pregnancy for another 18 months.
- ▶ PMH: Multiple UTIs
- ▶ OBHx: NSVD x1, no complications
- ▶ GynHx: Unremarkable. No prior history of STIs or abnormal pap smears. Uses condoms consistently.
- ▶ PSH: None
- ▶ Meds: prenatal vitamin
- ▶ All: NKDA
- ▶ SocHx: Lives with husband. Works as a sixth grade teacher. Denies EtOH, tobacco, illicit drugs. Denies domestic violence.

Case 4 cont.

- ▶ Urine dipstick shows small blood, large leukoesterase, nitrite positive, with "many" bacteria and WBC per high powered field.
- ▶ What else do you need to know about this patient?
 - *breastfeeding exclusively*
 - *health history of child*

Case 4 cont.

- ▶ You learn that the infant is G6PD-deficient.
- ▶ What treatment do you select for this patient's UTI?
 - *TMP/SMX (Bactrim DS)*
 - *Ciprofloxacin*
 - *Nitrofurantoin*
 - *Amoxicillin/clavulanate (Augmentin)*
 - *Cephalexin*

Case 4 cont.

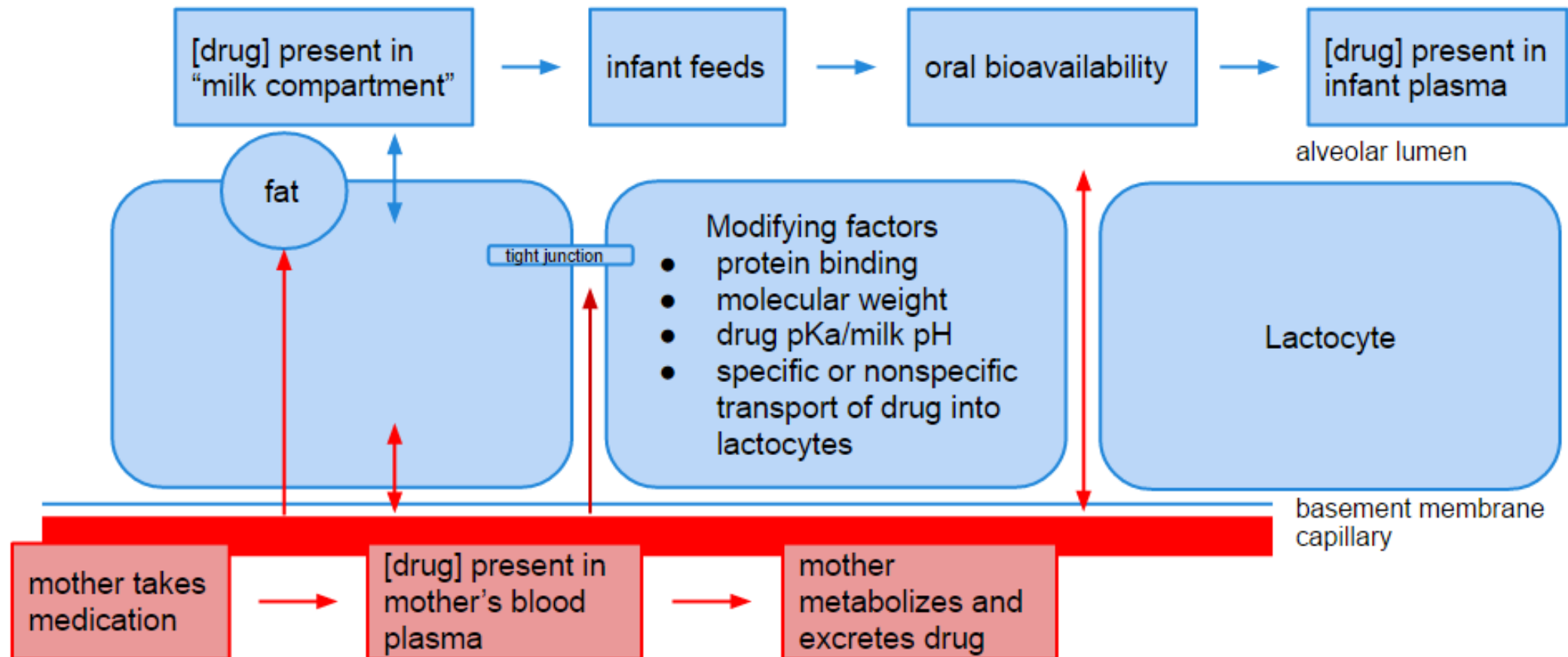
- ▶ What resources can you use if you are unsure about the safety of medication in breastfeeding?
- *Drugs and Lactation Database (LactMed)*
- *The InfantRisk Center / Medications & Mothers' Milk*
- *E-lactancia*
- *MotherToBaby.org*
- *The National Center for Complementary and Integrative Health*
- *Natural Medicines Database*

Case 4 cont.

► What contraceptive do you prescribe for this patient?

- Condoms
- Progestogen-only pill
- Combined oral contraceptive
- LARC
- Barrier
- Lactational amenorrhea

Medication Transfer



Alcohol



- Moderately safe while breastfeeding
- Mean half-life of 15 minutes
- Peak concentrations of alcohol in breastmilk in 30 - 90 minutes
- Milk:Plasma ratio is 1.0. An equilibrium exists between milk concentration and blood alcohol level
- Relative infant dose is 16% of maternal dose.
- Alcohol inhibits oxytocin release from the pituitary impeding milk letdown.

Caffeine

- Usually compatible with breastfeeding
- Mean half-life in adults is 4.9 hours, and half-life in neonates is as high as 97.5 hours
- Peak concentrations of caffeine in breastmilk occur in 1-2 hours
- Milk:Plasma ratio is 0.52-0.76
- Relative infant dose is 6% - 25.9% of maternal dose
- Suggested max daily dosage is 500mg.

Age	Half-Life
Neonate	3 – 4 days
3-5 months	14 hrs
> 6 months	3 - 7 hrs
Adult	3 - 7 hrs

12 oz Drink	Caffeine Level
Decaf Coffee	20 mg
Coke	40 mg
Tea	75 mg
Coffee	260 mg

Case 5

- ▶ **25 yo G1P0101** is a breastfeeding mother of 3 month old infant. She has dysphoria most of the day, tearfulness, irritation, significant weight loss, difficulty sleeping, and feels that she is a “bad mother.”
- ▶ What do you prescribe for this patient?

Postpartum Depression

- ▶ Edinburgh Postnatal Depression Scale
- ▶ Psychotherapy/counseling
- ▶ SSRIs
 - ▶ sertraline
 - ▶ fluoxetine
- ▶ SNRIs
- ▶ TCAs

<https://abm.memberclicks.net/assets/DOCUMENTS/PROTOCOLS/18-use-of-antidepressants-protocol-english.pdf>

Contraindicated Medications

- Drugs of abuse: marijuana is open question, methadone and buprenorphine are ok
- Some anticonvulsants: ethosuximide, primidone
- Ergot alkaloids: (but not methylergonovine)
- Levels of amiodarone, cyclosporine, and lithium should be monitored
- Antineoplastics: between therapies
- Radiopharmaceuticals: once drug has cleared
- Thyroid scan w/ I131: contraindicated
- Anesthesia: safe once awake and able to hold infant

How to Wean by Dr. Bill Sears

- Start by skipping a least favorite feeding
- Minimize situations that induce breastfeeding
- “Don’t offer, don’t refuse”
- Keep baby busy
- Set limits
- Don’t wean baby from you to an object
- Expect breastfeeding to increase during times of illness

Want to learn more?

Physician Guide to
Breastfeeding

Institute for the
Advancement of
Breastfeeding &
Lactation Education

AAP Physician
Education and
Training on
Breastfeeding

Academy of
Breastfeeding
Medicine (ABM)
Protocols

URMC Breastfeeding
& Lactation
Medicine Fellowship

North American
Board of
Breastfeeding and
Lactation Medicine

Summary

- Physicians have an important role to play in supporting and promoting breastfeeding
- Establish relationships with lactation specialists in your area
- Breastfeeding is not all-or-nothing -- women can breastfeed while they are with their baby and feed pumped breastmilk or formula when they are separated
- Policies, laws, and cultural context influence breastfeeding success
- Most medications are safe

Resources

- [Academy of Breastfeeding Medicine](#)
- [American Academy of Family Physicians](#)
- [American Academy of Pediatrics](#)
- [World Health Organization](#)
- [Global Health Media Breastfeeding Series](#)
- [LactMed](#)
- [The InfantRisk Center](#)
- [Kellymom.com](#)
- [International Lactation Consultant Association](#)
- [La Leche League International](#)
- [Breastfeeding USA](#)
- [WIC Breastfeeding Peer Counselors](#)
- [Northern Illinois Lactation Consultant Association](#)
- [Illinois State Breastfeeding Task Force](#)
- [Chicago Region Breastfeeding Task Force](#)