



# Medications and Breastfeeding for Primary Care Nurse Practitioners

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# Objectives

1. Discuss how lactation impacts the absorption and distribution of medications from the mother to child when selecting the safest medications to use during breastfeeding
2. Identify three medications that are contraindicated during breastfeeding
3. Analyze the medication plan for a breastfeeding mother/child couplet

# Clinical Case Study

- A 23 year old mother of an 8 week old exclusively breastfed infant presents with a complaint of a draining abscess on her right thigh
- NKDA
- Dx: MRSA



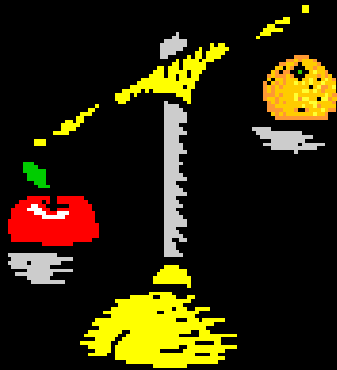
[Amrith Raj](http://en.wikipedia.org/wiki/File:Five_day_old_Abscess.jpg) share and share alike  
[http://en.wikipedia.org/wiki/File:Five\\_day\\_old\\_Abscess.jpg](http://en.wikipedia.org/wiki/File:Five_day_old_Abscess.jpg)

## A Common Story...

- The mother was prescribed Keflex 500mg QID and instructed to D/C Breastfeeding or “pump & dump” x 7 days
- Baby fed frozen breast milk & formula
- Refused the breast thereafter
- Breastfeeding/Breast milk feeding was abandoned

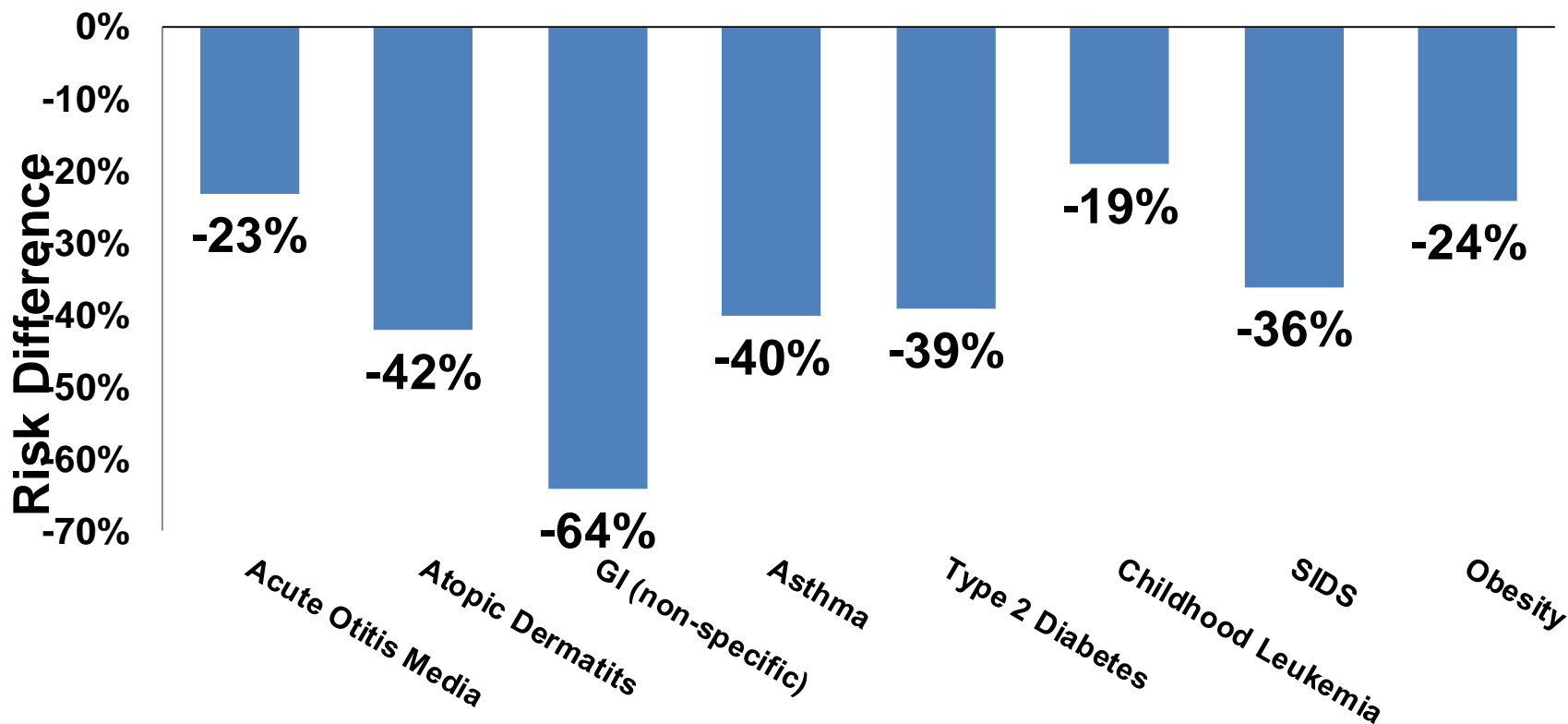
# Definition of Breastfeeding

- Exclusive breastfeeding vs ???
- Studies differ in definition
- Have mother quantify breastfeeding, breast milk feeding, formula feeding



# Breastfeeding: Important for Babies

## Risk Differences for Various Diseases



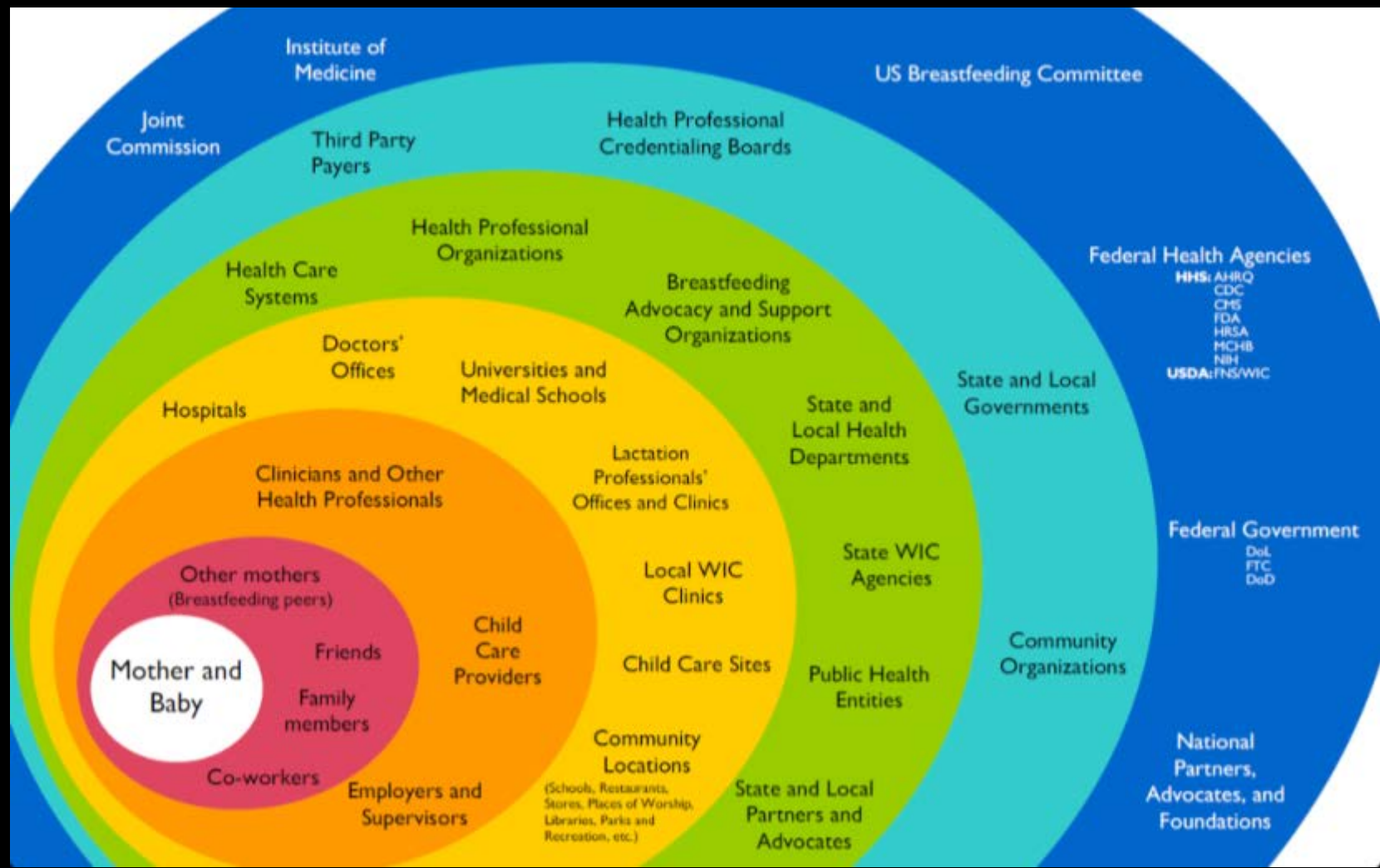
IP, AHRQ, 2007



# U.S. Cost Savings of \$12.97 billion

- If 90% of infants exclusively breastfed x 6 months
  - SIDS, NEC, LRTI, OM, Atopic Derm, Childhood obesity, Childhood Asthma, Gastroenteritis, Leukemia, type 1 DM
- Costs of formula
- Costs of time off work for parents caring for sick children

# Where are you?



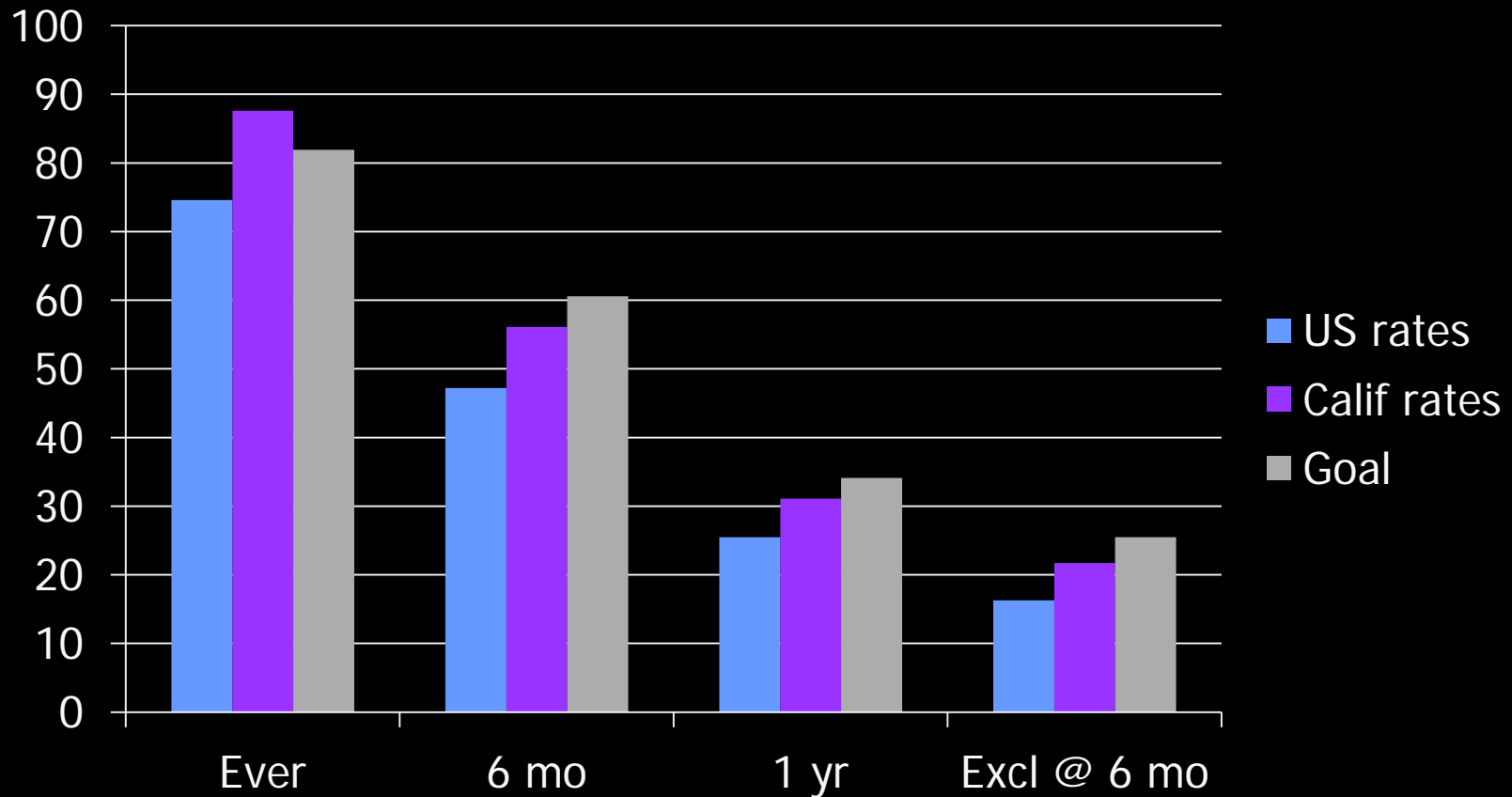
from Grummer-Strawn CDC USBC Teleconference, Feb 2011



# National Recommendations & Trends

- Healthy People 2020
- Baby Friendly USA & Ten Steps
  - 54 Baby Friendly Designated Hospitals in CA
- Joint Commission Core Measures include
  - Exclusive breast milk feeding
- Surgeon General's Call to Action to Support Breastfeeding

# Healthy People 2020 BF Goals vs Actual Rates (CDC 2012)



# Baby-Friendly Hospital Initiative

## WHO/UNICEF Initiative

- Hospitals recognized & designated as Babyfriendly
  - Evidence-based, quality care, supports Breastfeeding
- External review process

How many hospitals are Baby-Friendly?

Globally	20,000+
United States	153
California	54
Los Angeles County	13

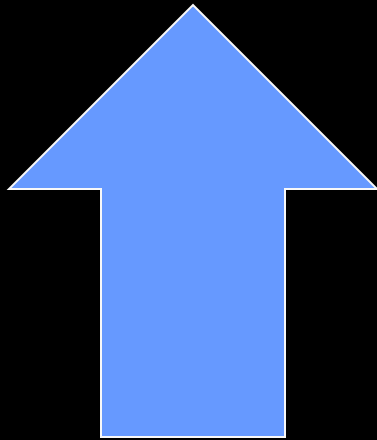


# The Ten Steps to Successful BF

(Baby Friendly USA, nd)

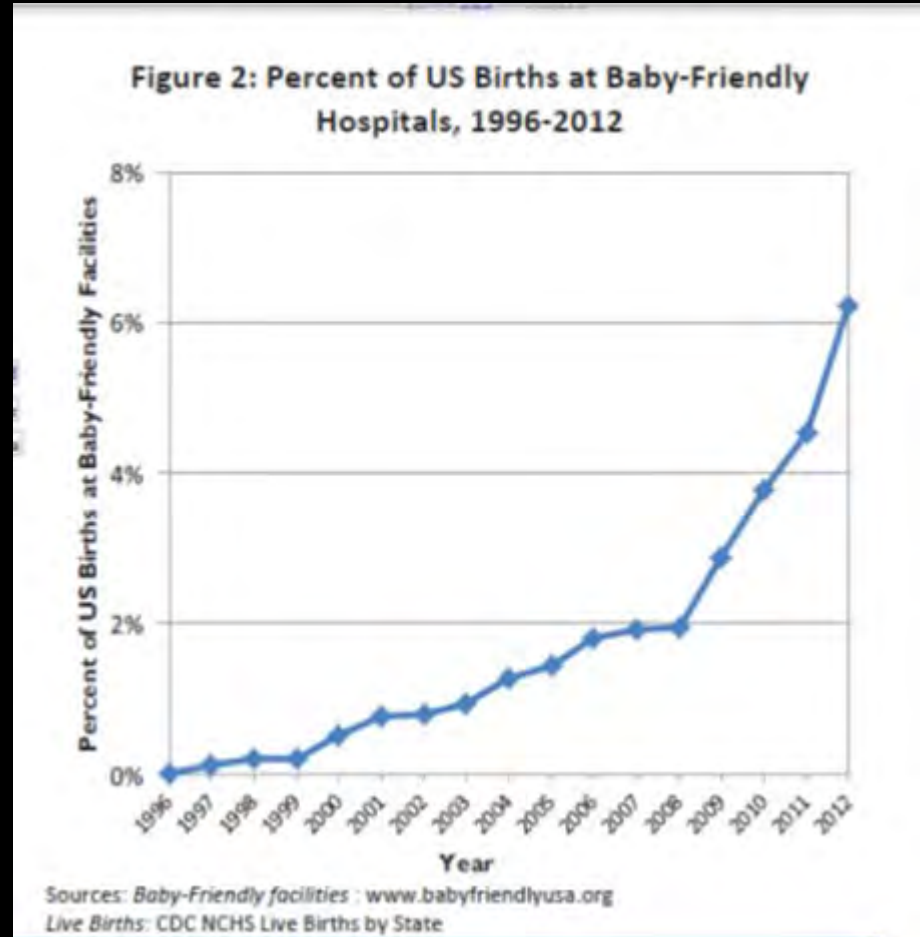
- 1 - Breastfeeding Policy
- 2 - Train all health care staff
- 3 - Teach benefits & management of BF
- 4 - Help mothers initiate BF within one hour of birth
- 5 - Show mothers how to BF & maintain lactation
- 6 - Newborns get no food or drink other than breastmilk, unless *medically* indicated
- 7 - Keep mothers & infants together 24 hours a day
- 8 - Encourage breastfeeding on demand
- 9 - No pacifiers or artificial nipples to BF infants
- 10 - Refer mothers to BF support groups @ D/C

# Births at Baby-Friendly Facilities Rising



**CDC Breastfeeding  
Report Card 2012**

<http://www.cdc.gov/breastfeeding/data/reportcard.htm>



# What Can Health Care Community Do?



Surgeon General Regina Benjamin, MD  
2011

- “Provide breastfeeding education for health clinicians who care for women and children”
- Ensure access to International Board Certified Lactation Consultants (IBCLC)

<http://www.surgeongeneral.gov/topics/breastfeeding/factsheet.html>

# Impact of EBF on NP's

- More newborns discharged from birth hospitals into community
  - Require assessment day 3-5 of life
- More long-term breastfeeding mothers
  - Presenting for primary care
  - Medication requirements

# NP Impact on Breastfeeding Success

- Minimize risks
  - Judicious selection, dosing, & use of meds
  - Protect mother's confidence & milk supply
- Maximize medication safety
  - Quality, evidence based resources
  - Select safest medication



# Breastfeeding is Important for Babies

- Risks of stopping breastfeeding outweigh risk of medications
- Fetus more vulnerable than infant

# Placenta vs Breast

- Risk during pregnancy is not the same as risk during lactation



Jeremy Kemp, 2005  
[Human placenta baby side.jpg](#)

Tom Adriaenssen - Flickr  
<http://www.flickr.com/photos/inferis/60623354>

# Medications and Breastfeeding: Key Points

1. Most meds are compatible with BF
2. Amount of drug in milk usually sub-clinical
3. Risks of stopping breastfeeding far outweigh the risks of med. exposure
4. Minimize risk by:
  - a. Judicious drug use, selection & dose
  - b. Protect mother's confidence & milk supply

# Pharmacokinetics: action of drug in body

- Molecular weight:
  - Large molecules can't pass into milk
- Plasma protein binding
  - Tightly bound medications don't enter milk
- pH: breast milk more acid than plasma
  - Lower pH meds lower concentration in milk
- Solubility: fat in milk
  - Water soluble meds lower milk concentration

# Oral bioavailability of drug in infant

- GI digestion & hepatic metabolism decreases exposure of infant

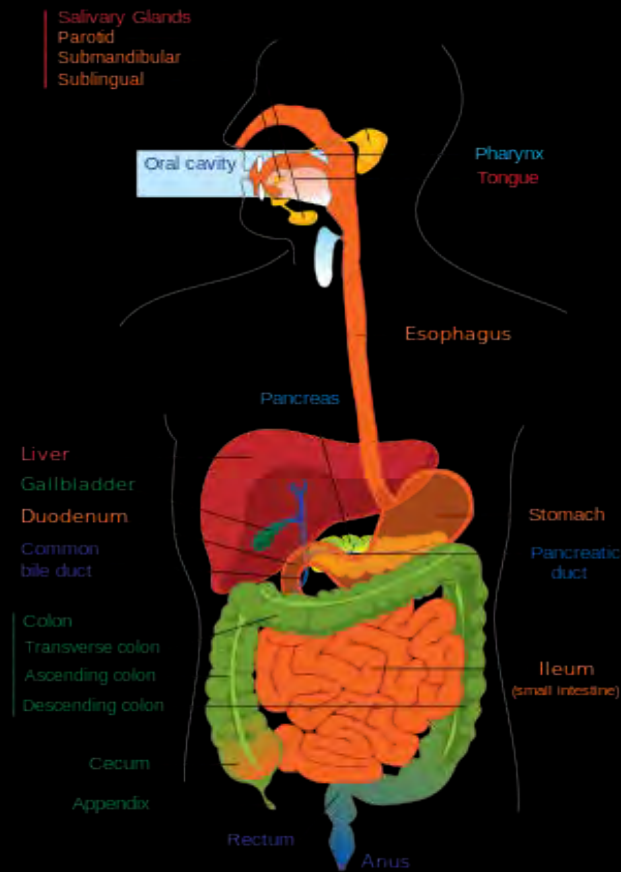


Photo: Maria Ruiz wikipedia public domain  
[http://en.wikipedia.org/wiki/File:Digestive\\_system\\_diagram\\_edit.svg](http://en.wikipedia.org/wiki/File:Digestive_system_diagram_edit.svg)

# Rx Acceptable During Lactation

- If acceptable during pregnancy
- If acceptable to use in infants -
  - Pediatric dose usually 10-100 times higher than exposure via milk

# Minimize Infant Exposure

- Route
  - Choose topical over systemic
- Schedule
  - Take just after breastfeeding
  - Daily dosing before longest infant sleep
- Monitor
  - Infant side effects? Report to Hale & FDA
- Dose
  - Lowest effective dose
  - Shortest effective duration

# Early Vulnerability: First 7 Days of Life

- Gaps between breast alveolar cells
  - Allow passage of immunoglobins, cells, and medications
- Immature infant liver and renal function
  - Impaired metabolism & excretion
  - Avoid meds with long half-lives
- Very low volume of milk first week



# Characteristics of Safest Drugs

- Drugs that don't enter milk easily
  - Highly protein bound
  - Large molecule (molecular wt >500)
  - Neutral or weak acids
  - Water soluble
- Not absorbed
- Short half-life
- Used during pregnancy & infancy
- Relative infant dose (RID) 10% or less

# Relative Infant Dose (RID)

- Weight-adjusted infant dose relative to maternal dose
- Interpretation
  - < 10% generally considered safe
  - < 1% for most drugs

$$\text{RID} = \frac{\text{Infant dose } \underline{\text{mg/kg}} \text{ day}}{\text{Mother dose } \underline{\text{mg/kg}} \text{ day}}$$

# Drugs That Don't Get into Milk Easily

- Molecule is too big
  - Heparin - molecular weight is 30,000 (<200 passes into milk easily)
- Bound to maternal proteins
  - Warfarin - 99% is bound
- Too little absorbed
  - IV or oral contrast & heparin
  - Tetracycline – bound to milk calcium

# Medications Contraindicated in BF

- Two main concerns
  1. Drugs that pose a risk to milk production
    - Estrogen
    - Pseudoephedrine
    - Antihistamines
    - Ergot and derivatives
  2. Drugs that pose a risk to the infant

# Contraindicated Medications

- Antineoplastics – not compatible with BF
- Radioisotopes – **some** incompatible
  - American College of Radiology [www.acr.org](http://www.acr.org)
  - May require temporary or permanent cessation of BF
  - Short term “Pump and dump” – maintain supply

# Medications Contraindicated in BF: "The Short List"

- Amiodarone
- Chloramphenacol
- Ergotamine
- Gold salts
- Lithium
- Phenindione
- Retinoids
- Atenolol
- Acebutolol
- Bromocriptine
- Salicylates
- Clemastine
- Phenobarbital

Let's Go Fishing...



# Select Quality References

- AAP (2001). The transfer of drugs and other chemicals into human milk.
- ABM clinical protocols #15 & 18
- Briggs (2005). Drugs in pregnancy & lactation
- Lawrence (2008). Breastfeeding: A guide for the medical profession



# Avoid the PDR



- General information about pregnancy and breastfeeding
- Often recommends avoiding meds during breastfeeding

# References of Choice

- Hale: 2012 Medications and Mothers Milk
- LactMed: <http://toxnet.nlm.nih.gov/>
- There's an APP for that! – iPhone & Android



# Hale Lactation Risk Rating

- L1: Safest
  - Many users, No Infant Adverse Effect (IAE)
- L2: Safer
  - Limited users with rare or no IAE
- L3: Moderately Safe
  - IAE possible but not studied
- L4: Possibly hazardous
  - Evidence of risk, maternal benefits may justify
- L5: Contraindicated
  - Significant risk likely or demonstrated

# Clinical Case Study

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# Case Study

- A 36 year old mother of an exclusively breastfeeding, 3 month old infant, presents with swelling & ecchymosis of left ankle after stepping off a curb, “twisting” her ankle & hearing a “pop”.
- NKDA
- Dx: Left ankle fracture



[Photo: Boldie](http://en.wikipedia.org/wiki/File:Sprained_foot.jpg) public domain  
[http://en.wikipedia.org/wiki/File:Sprained\\_foot.jpg](http://en.wikipedia.org/wiki/File:Sprained_foot.jpg)

# SPECIFIC DRUG CATEGORIES



# Contraceptives



- Lactational Amenorrhea Method (LAM)
- Intrauterine contraception (IUD/IUS)
- Avoid methods containing estrogen
- Progestin only methods after 6 weeks
  - Allows full development of milk supply
  - Progestin only pills (POPs), DMPA, Implanon

# Estrogen – comes in many forms

- Contraception & Hormone Replacement (HT)
  - Combination Oral Contraceptives (COC's)
    - Consider progestin only pills (POPs) after 6 weeks
  - Vaginal ring - contraceptive or HT
  - Vaginal estrogen cream HT
  - *Monthly* contraceptive injection (not DMPA)



# Antimicrobials

- Low concentrations in breast milk
- Most are “safe” per American Academy of Pediatricians (AAP)
- Observe for side effects – diarrhea/rash
- Try to avoid drugs used with caution in children (eg. Cipro, tetracycline)
  - Risk may outweighs benefit
    - Cipro in cases of anthrax

# Antibiotics



- Penicillins & cephalosporins
  - Well studied
  - Poor entry into breast milk
- Tetracycline & doxycycline
  - Short-term use <3weeks - compatible
  - Binds w/calcium, poorly absorbed in infant
- Fluoroquinolones- Risk/Benefit ratio

# Antibiotics (continued)

- Metronidazole
  - May change flavor of - metallic taste
  - Topical and vaginal formulations preferred
- Anti-viral
  - Valacyclovir preferred
    - Acyclovir and valacyclovir minimal risk to infant

# Cold & Allergy



- Topical preferred over systemic (nasal spray)
- Pseudoephedrine may ↓ milk production
- Use non-sedating agents during SIDS risk period
- Comparison of OTC options – see Hale

# Depression



- Maximize non-pharmacological tx
  - Counseling
  - Breastfeeding & mothering support
  - Home & infant help – facilitate sleep
  - Social support groups
    - Postpartum Support International
    - 1-800-944-4PPD
  - La Leche League – 1-800-LaLeche

# Anti-depressant Medications

- Rare reports on beh. & development
- Sedation - possible SIDs risk factor
- Lipophilic drugs
  - Cross easier into milk & brain
- Risk-benefit
  - Treat mother as needed
  - Breastfeed
  - Minimize infant exposure and monitor SE's

# Preferred Anti-depressants

- Sertraline (Zoloft)
  - Highly protein bound
  - Undetectable infant serum levels, No adverse effects in infant reported
- Fluvoxamine (Luvox) – short half life
- Paroxetine (Paxil) short half life
  - Some evidence of harm with FETAL exposure

# Analgesia/Pain



- Non-narcotic agents - preferred
  - Acetaminophen
  - Ibuprofen
  - Naproxen
- Avoid ASA
  - Consider Reyes syndrome
  - 81mg/day dose probably safe



# Narcotics

- AAP: Generally compatible w/ breastfeeding
- Neonatal vulnerability
  - Slower metabolism – drug accumulation
- Genetic variability of drug metabolism
  - Amount in milk usually minimal
  - Ultra-rapid liver CYP2D6 metabolizers may excrete unusually high amounts into milk

# Preferred Narcotics

- Hydrocodone (Vicodin)
- Morphine
  - poor bioavailability to infant

# Narcotics Considerations

- Codeine & Oxycodone – less preferable
  - Unpredictable metabolism
  - CNS depression in infants – report of deaths
- Use all narcotics with caution
- Monitor infant for sedation/side effects
- Decrease dose as soon as possible
- Change to acetaminophen when possible

# Antihypertensives



- Preferred ACEIs – most data
  - Captopril
  - Enalapril
- No data on ARBs
- Preferred Beta Blockers
  - Metoprolol
  - Propranolol
  - Labetalol

# Antihypertensives (continued)

- Preferred Calcium Channel Blockers
  - Nifedepine
  - Verapamil
- Diuretics
  - No reported complications in infant or milk production with HCTZ at  $\leq 50\text{mg/day}$

# Endocrine Medications

- Metformin
  - Low amounts in milk
- Glyburide
  - 6 mothers single 5mg dose & 2 mothers 10mg dose – undetectable in breast milk & no hypoglycemia
- Insulin - safe
  - Large peptide molecule
  - Destroyed by infant GI system



# Practice Recommendations - Summary

- If Rx is needed use:
  - Safest drug
  - Use for the shortest effective duration
  - Lowest dose to limit infant exposure
- Maximize non-pharmacological tx
- Protect mom's confidence & milk supply
  - Stress value and safety of her milk
  - Pump to maintain supply prn

# NP support of Breastfeeding

- Encouraging words
  - “Breastfeeding is important for you & baby”
  - “You can do this”
  - “This is challenging”
  - “It will get easier”
  - “Don’t give up”
- Appropriate support and Referrals



# Barriers to Breastfeeding NPs can control

- Allowing BF babies to appts - privacy
- Acceptance & judgment – all age babies
- Obtaining history related to BF
- Appropriate medications
- Referrals – Referrals – Referrals!!!

# Patient Referrals

- Breastfeed LA (formerly Breastfeeding Task Force of LA)
  - [www.breastfeedla.org](http://www.breastfeedla.org)
- International Lactation Consultants Assn (ILCA)
  - [www.ilca.org](http://www.ilca.org)
- La Leche League
  - [www.llli.org](http://www.llli.org) 1-800-LaLeche 1-800-525-3243
- Women, Infants, & Children (Calif WIC)
  - [www.cdph.ca.gov/programs/wicworks/Pages/default.aspx](http://www.cdph.ca.gov/programs/wicworks/Pages/default.aspx)

# Apps: Medications and Breastfeeding

- Healthcare Professionals Guide to Breastfeeding. (2012). App available at: <http://www.texastenstep.org/guide.htm>
- Lact med. US National Library of Medicine: <http://toxnet.nlm.nih.gov/help/lactmedapp.htm>

# Breastfeeding Education for Health Care Professionals

- Academy of Breastfeeding Medicine  
[www.bfmed.org](http://www.bfmed.org)
- American Academy of Pediatrics  
[www.aap.org](http://www.aap.org)  
[www2.aap.org/breastfeeding/index.html](http://www2.aap.org/breastfeeding/index.html)
- American College of Radiology [www.acr.org](http://www.acr.org)
- Infant risk center for health professionals:  
806-352-2519 [www.infantrisk.com](http://www.infantrisk.com)

# Breastfeeding Education for Health Care Professionals (continued)

- Stanford School of Medicine Breastfeeding Videos - <http://newborns.stanford.edu/Breastfeeding/>
- Univ. of Virginia Breastfeeding Training - <http://www.breastfeedingtraining.org/>
- Wellstart Lactation Management Self Study - <http://www.wellstart.org/>

# THANK YOU!



# Special Acknowledgement

- O'Hara, M. (2008). *Increasing breastfeeding success: What the research shows and why it matters*. Physician Lactation Education Collaborative of Washington. Available at:  
<http://www.breastfeedingwa.org/collaborative>

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- Academy of Breastfeeding Medicine Protocols. Available at: <http://www.bfmed.org/Resources/Protocols.aspx>
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- United States. Department of Labor. (2010). *Fact Sheet #73: Break time for nursing mothers under FLSA*. From <http://www.dol.gov/whd/regs/compliance/whdfs73.pdf>