I Never Heard of LactMed!
Enhancing Obstetric and Pediatric Usage

Monday, September 22, 2014
6:00 PM Eastern/5:00 PM Central/4:00 PM Mountain/3:00 PM Pacific

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Webinar Faculty

- **Philip O. Anderson, Pharm.D., FCSHP, FASHP** is presently a Health Sciences Clinical Professor of Pharmacy at the UCSD Skaggs School of Pharmacy and Pharmaceutical Sciences where he heads the course on drug information. Dr. Anderson has lectured and published extensively on drug use during breastfeeding since the 1970s including in professional journals and textbooks. He has recently revised the medications and breastfeeding chapter in the 2nd edition of the Breastfeeding Handbook for Physicians, and has authored the appendix to the popular lay handbook, *The Nursing Mothers’ Companion* and the drugs and breastfeeding list on BabyCenter.com. He is a member of the Editorial Board of the journal, *Breastfeeding Medicine*.

- **Lauren Hanley, MD, FACOG, IBCLC** is an Obstetrician/Gynecologist and Breastfeeding Medicine Specialist at the Massachusetts General Hospital in Boston, Massachusetts. She is an Assistant Professor of Obstetrics, Gynecology and Reproductive Biology at Harvard Medical School. She currently serves as the Chair and a founding member of the Expert Working Group in Breastfeeding of the American Congress of Obstetricians and Gynecologists. She also serves on the Executive Board of the Massachusetts Breastfeeding Coalition. She runs a lactation clinic at her hospital where she specializes in infectious complications of breastfeeding, low milk supply and induced lactation. She teaches medical students and residents about topics related to lactation in small group settings and has recently run breastfeeding skills workshops for her department.

- **Natasha K. Sriraman, MD, MPH, FAAP, FABM** is an academic pediatrician and breastfeeding medicine specialist at The Children’s Hospital of the King’s Daughters and is an Assistant Professor of Pediatrics at Eastern Virginia Medical School in Norfolk, Virginia. She currently serves on the AAP Section on Breastfeeding as the Education Chair. She is a Board Member of the Virginia Chapter of the AAP where she serves as the State Co-Chapter Breastfeeding Coordinator and Chair of Education. She is on the Board of Directors for the Academy of Breastfeeding Medicine, and also serves on the Annual Conference Committee as the Chair of Abstracts. She is part of the Virginia State Breastfeeding Advisory Committee, and is on the Board of Directors for Postpartum Support Virginia. Dr. Sriraman’s interests and research have focused on breastfeeding support in the workplace, cultural and socio-economic disparities in breastfeeding, and how to support the breastfeeding mother with postpartum mood and anxiety disorders (PMAD).
Disclosure of Financial Relationships

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Learning Objectives

- Effectively search for a drug’s safety profile for use in lactation.
- Explain why infant age is an important factor in the assessment of safety.
- Identify which drug factors would enhance passage into breastmilk and why.
- List the benefits and risks of treating postpartum depression while breastfeeding.
LactMed Development and Use

Philip Anderson, Pharm.D., FASHP

Health Sciences Clinical Professor
University of California San Diego
Skaggs School of Pharmacy and Pharmaceutical Sciences
LactMed Timeline

- 2003 conceived by Philip Anderson and NLM
- 2004 review panel convened; content & format defined
  - Cheston Berlin, MD (Hershey Medical Center [AAP list originator])
  - Shinya Ito, MD (Hospital for Sick Children, Toronto)
  - Kathleen Uhl, MD (FDA Office of Women’s Health)
  - James Knoben, PharmD, MPH & Philip Wexler, MLS (NLM)
- November 2005 focus group: database name and formatting changes
- April 2006 LactMed goes live
  - About 480 drug and vaccine records
- 2007 diagnostic agents added
- 2008 radiopharmaceuticals added – 1 specialist reviewer
- 2011 complementary therapies added – 3 specialist reviewers
Current Status

- 1100+ records total
  - 900+ drug and vaccine records
  - 120 complementary therapies
    - 90 are herbals
  - 70 diagnostic agents
    - 40 are radiopharmaceuticals
    - Specific recommendations for withholding breastfeeding
  - Cross-referenced with brand, generic, chemical and botanical names
- Web site updated monthly
  - New drugs, new data, reference updates, corrections
- App updated about every 6 months
Current Usage

- Web Site---About 80,000 inquiries per month
- App downloads September 2013-August 2014
  - iPhone 54,800
  - Android 31,894
- Cannot track the number of drugs looked up on the apps
Bookmark it or just Google it

LactMed

About 71,900 results (0.20 seconds)

LactMed - Toxnet - National Institutes of Health

toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?LACT

A description for this result is not available because of this site's robots.txt – learn more.
LactMed
A TOXNET DATABASE

SEARCH LACTMED

BROWSE LACTMED
ADVANCED SEARCH

Search Term:

Search:

Included Synonyms and CAS Numbers in Search

About LactMed
What is LactMed?
The LactMed® database contains information on drugs and other chemicals to which breastfeeding mothers may be exposed. It includes information on the levels of such substances in breast milk and infant blood, and the possible adverse effects in the nursing infant. Suggested therapeutic alternatives to those drugs are provided, where appropriate. All data are derived from the scientific literature and fully referenced. A peer review panel reviews the data to assure scientific validity and currency.

Updates: LactMed is updated monthly.

Did you know
How do I access the LactMed database?
The following TOXNET databases are available for lease: ChemIDplus, DRLINE, CCRIS, GENE-TOX, HSDB, and TOXLINE.

For further information visit Leasing Data from the National Library of Medicine.

More FAQs

Support
Resources
LactMed App
LactMed Record Format
Database Creation & Peer Review Process
Help
Fact Sheet
Sample Record
TOXNET FAQ
Glossary
About Dietary Supplements
Breastfeeding Links
Get LactMed Widget

Contact Us
Email: techp@nih.nlm.nih.gov
Telephone: (301) 498-1131
Fax: (301) 498-3537

Environmental Health & Toxicology
Resources on environmental health and toxicology
Visit Site
Sertraline

CASRN: 79817-96-2

Drug Levels and Effects:

Summary of Use during Lactation:

Because of the low levels of sertraline in breastmilk, amounts ingested by the infant are small and is usually not detected in the serum of the infant. Although the weakly active metabolite desmethylsertraline is often detectable in low levels in infant serum. Rarely, preterm infants with impaired metabolic activity might accumulate the drug and demonstrate symptoms similar to neonatal abstinence. Most authoritative reviewers consider sertraline one of the preferred antidepressants during breastfeeding. [1][2][3][4] Mothers taking an SSRI during pregnancy and postpartum may have more difficulty breastfeeding and may need additional breastfeeding support.
Drug Levels:

Sertraline is metabolized to norsertraline that has antidepressant activity considered to be 10% that of sertraline.[2]

Maternal Levels In a pooled analysis of serum levels from published studies and 4 unpublished cases, the authors found that 15 mothers taking an average daily dosage of 83 mg (range 25 to 200 mg) had an average breastmilk sertraline level of 45 mcg/L (range 7 to 207 mcg/L).[2] Using the average dosage and milk level data from this paper, an exclusively breastfed infant would receive an estimated 0.0% of the maternal weight-adjusted dosage of sertraline.

Twenty-six women who were an average of 16.8 weeks postpartum (range 5 to 36 weeks) and receiving an average of 124 mg sertraline daily for at least 14 days for severe depression were studied while breastfeeding with extensive milk and serum sampling over a 24-hour period. All milk samples had detectable sertraline (average 129 mcg/L; range 11 to 938 mcg/L) and desmethyldertraline (average 258 mcg/L; range 20 to 1498 mcg/L). Drug concentrations were higher in the hindmilk than the foremilk. Analysis of milk sertraline data from 15 mothers who submitted complete sets of milk samples indicated that the peak concentration of the drug and metabolite occurred 8 to 9 hours after a dose. In these women, the concentration in milk correlated with serum concentration, but not daily dosage. The authors estimated that an exclusively breastfed infant would receive an average of 0.54% of the maternal weight-adjusted dosage and that pumping and discarding milk 8 to 9 hours after the mother's dose would decrease the infant's daily dosage by 17%.[5]

From data in 6 mothers who were 5 to 34 weeks postpartum and taking sertraline in an average daily dosage of 64 mg (range 50 to 100 mg), the authors estimated that an exclusively breastfed infant would receive 0.9% of the maternal weight-adjusted dosage.[1]

At 2 months postpartum, 4 mothers taking an average of 87.5 mg of sertraline daily had average milk levels of 29.4 mcg/L of sertraline and 29 mcg/L of desmethyldertraline at random times after the previous dose. The authors estimated that an exclusively breastfed infant would receive 0.04 mg/kg of sertraline daily.[6]

The mother of a preterm infant was taking sertraline 150 mg daily during pregnancy and postpartum. Her breastmilk levels of sertraline and desmethyldertraline on 3 days at random times averaged 201 and 358 mcg/L, respectively.[7]

Infant Levels Of 30 breastfed infants (19 exclusively, 11 breastfed 50% or more) aged 6 to 13 weeks, 22 had undetectable (<1 mcg/L) sertraline serum levels during maternal therapy with sertraline dosages of 25 to 200 mg daily. Of the 8 infants who had detectable serum levels, their average sertraline serum level was 7.9 mcg/L. Their mothers, who were taking an average of 109 mg daily, had an average serum level of 52.5
Effects in Breastfed Infants:

Two side effects possibly related to sertraline in breastmilk have been reported to the Australian Adverse Drug Reaction Advisory Committee. Benign neonatal sleep myoclonus occurred in one 4-month-old infant[11] and agitation that spontaneously resolved was reported in another infant.[12]

None of 26 infants with an average age of 16.6 weeks (range 4 to 28 weeks) whose mothers were receiving an average of 124 mg sertraline daily had any detectable acute adverse reactions to sertraline in breastmilk. All had been breastfeeding for at least 3 weeks.[5]

Whole blood serotonin levels were measured in 14 mothers and their breastfed infants after 6 to 16 weeks of sertraline therapy. Maternal dosages ranged from 25 to 200 mg daily. Although maternal serotonin levels were decreased from 159 mcg/L to 19 mcg/L by sertraline therapy, infant serotonin levels averaged 227 mcg/L before and 224 mcg/L after maternal therapy. The authors concluded that these findings indicate that the amount of sertraline ingested by the infants was not sufficient to affect platelet serotonin uptake in breastfed infants. Platelets and neurons both have the same serotonin transporter, so this lack of effect was seen as indirect evidence of safety of sertraline use during breastfeeding. None of the infants experienced any adverse effects from sertraline in breastmilk, including 6 exclusively breastfed infants under 3 months of age.[13]

Twenty-five mothers who took an average sertraline dosage of 82.4 mg daily breastfed their infants exclusively for 4 months and breastfed at least 50% during months 5 and 6. Their infants had 6-month weight gains that were normal according to national growth standards and the mothers reported no abnormal effects in their infants.[14]

In 6 infants aged 5 to 34 weeks whose mothers were taking sertraline 50 to 100 mg daily, no adverse reactions were noted clinically at the time of the study.[1]

No adverse effects were seen in 7 infants who were 4 weeks old and whose mothers had been taking sertraline 50 mg daily since day 4 postpartum.[9]

One study of side effects of SSRI antidepressants in nursing mothers found no adverse reactions that required medical attention among 2 infants whose mother was taking sertraline. No specific information on maternal sertraline dosage, extent of breastfeeding or infant age was reported.[15]
Effects on Lactation and Breastmilk:

Sertraline has caused galactorrhea in nonpregnant, nonnursing patients.[19][20][21] However, in a study of cases of hyperprolactinemia and its symptoms (e.g., gynecomastia) reported to a French pharmacovigilance center, sertraline was not found to have an increased risk of causing hyperprolactinemia compared to other drugs.[22] The prolactin level in a mother with established lactation may not affect her ability to breastfeed.

A midwife observed 6 patients who reported a decrease in milk supply after starting sertraline (dosages not reported). One of the mothers had been taking sertraline since the 6th month of pregnancy. She reported an increase in milk supply when she stopped sertraline for one week at 4 months postpartum. When she restarted sertraline, her milk supply reportedly decreased. In all of the women, the milk supply increased in 2 to 3 days after increasing fluid and the frequency of nursing.[23]

In a small prospective study, 6 primiparous women who were taking a serotonin reuptake inhibitor (SRI; 3 taking fluoxetine and 1 each taking citalopram, duloxetine, eszopiclone, paroxetine or sertraline) were compared to 423 mothers who were not taking an SRI. Mothers taking an SRI had an onset of milk secretion activation (lactogenesis II) that was delayed by an average of 16.7 hours compared to controls (85.8 hours postpartum in the SRI-treated mothers and 69.1 h in the untreated mothers), which doubled the risk of delayed feeding behavior in the untreated group. However, the delay in lactogenesis II may not be clinically important, since there was no statistically significant difference between the groups in the percentage of mothers experiencing feeding difficulties after day 4 postpartum.[24]

A case control study compared the rate of predominant breastfeeding at 2 weeks postpartum in mothers who took an SSRI antidepressant throughout pregnancy and at delivery (n = 167) or an SSRI during pregnancy only (n = 117) to a control group of mothers who took no antidepressants (n = 182). Among the two groups who had taken an SSRI, 33 took citalopram, 19 took eszopiclone, 60 took fluoxetine, 2 took fluvoxamine, 76 took paroxetine, and 87 took sertraline. Among the women who took an SSRI, the breastfeeding rate at 2 weeks postpartum was 27% to 33% lower than mother who did not take antidepressants, with no statistical difference in breastfeeding rates between the SSRI-exposed groups.[25]

Alternate Drugs to Consider:

Nortriptyline, Paroxetine
References:


Why no classification system?

Age matters!
Dosage matters
Adverse Reactions by Age

78% of reactions occurred at 2 months or under
96% of reactions occurred at 6 months or under

Phases of Breastfeeding

Early Neonatal Period (days 0-5)
- Transplacental passage
  - Infant can be born with measurable drug levels
  - Infant drug exposure via breastmilk is always less than in utero exposure
- Low breastmilk intake—13 mL/kg on day 1
- Some drugs can profoundly decrease lactation

Later Neonatal Period (days 5-30)
- Increased milk intake - average 150 mL/kg/day
- Slow, but increasing, drug clearance
- Drugs can still decrease lactation
Phases of Breastfeeding

- Over 1 Month
  - Better drug elimination by the infant
  - mL/kg milk intake decreases
  - Lactation less susceptible to drugs

- Partial or Full Weaning
  - Reduced breastmilk intake & therefore, reduced drug dosage
Example Cases

- Oxycodone (e.g., Percocet) for Post-Cesarean Section Pain
- Fluoxetine (e.g., Prozac) for Postpartum Depression (~2 months postpartum)
Oxycodone (e.g., Percocet) Post-Cesarean Section

**Summary of Use during Lactation:**

Maternal use of oral narcotics during breastfeeding can cause infant drowsiness, central nervous system depression and even death. Infant sedation is common and well documented with maternal use of oxycodone. Newborn infants seem to be particularly sensitive to the effects of even small dosages of narcotic analgesics. Once the mother’s milk comes in, it is best to provide pain control with a nonnarcotic analgesic and limit maternal intake of oral oxycodone (and combinations) to a few days. A maximum oxycodone dosage of 30 mg daily is suggested. Oxycodone elimination is decreased in young infants with much inter-individual variability. Monitor the infant closely for drowsiness, adequate weight gain, and developmental milestones, especially in younger, exclusively breastfed infants. If the baby shows signs of increased sleepiness (more than usual), difficulty breastfeeding, breathing difficulties, or limpness, a physician should be contacted immediately. Other agents are preferred over oxycodone during breastfeeding.[1]
Fluoxetine (e.g., Prozac) for Postpartum Depression

Summary of Use during Lactation:

The average amount of drug in breastmilk is higher with fluoxetine than with most other SSRIs and the long-acting, active metabolite, norfluoxetine, is detectable in the serum of most breastfed infants during the first 2 months postpartum and in a few thereafter. Adverse effects such as colic, fussiness, and drowsiness have been reported in some breastfed infants. Decreased infant weight gain was found in one study, but not in others. No adverse effects on development have been found in a few infants followed for up to a year.

If fluoxetine is required by the mother, it is not a reason to discontinue breastfeeding. If the mother was taking fluoxetine during pregnancy or if other antidepressants have been ineffective, most experts recommend against changing medications during breastfeeding. Otherwise, agents with lower excretion into breastmilk may be preferred, especially while nursing a newborn or preterm infant. The breastfed infant should be monitored for behavioral side effects such as colic, fussiness or sedation and for adequate weight gain. Mothers taking an SSRI during pregnancy and postpartum may have more difficulty breastfeeding and may need additional breastfeeding support.
Fluoxetine (e.g., Prozac) for Postpartum Depression

Alternate Drugs to Consider:

Nortriptyline, Paroxetine, Sertraline
Inpatient Quandaries

Lauren Hanley, MD, FACOG, IBCLC
Massachusetts General Hospital
Harvard Medical School
Labor and Delivery Admission

- 39 y/o G1P0 at 35 wks gestation
- Blood Pressures 160-180/100-110
- 24 hr urine protein of 560 mg
- Headache

- Plan: Induction of Labor for severe preeclampsia
Treatment plan

- Magnesium sulfate
- Labetolol
- Oxytocin
- May need treatment for her headache?
Labetolol

Summary of Use during Lactation:

Because of the low levels of labetalol in breastmilk, amounts ingested by the infant are small and would not be expected to cause any adverse effects in fullterm breastfed infants. No special precautions are required in most infants. However, other agents may be preferred while nursing a preterm infant.

Drug Levels:

The excretion of beta-adrenergic blocking drugs into breastmilk is largely determined by their protein binding. Those with low binding are more extensively excreted into breastmilk. Accumulation of the drugs in the infant is related to the fraction excreted in urine. With 50% protein binding, 5% renal excretion and a moderate half-life, labetalol presents moderately low risk for accumulation in infants.

Maternal Levels. Random milk levels from 15 women on the third day postpartum averaged 27.5 mcg/L after maternal doses ranging from 330 to 400 mg daily. One of the women who took labetalol 400 mg daily for 5 weeks had no detectable drug in breastmilk (assay limit not specified). In another 9 women taking 600 to 800 mg daily, the average random milk level was 41 mcg/L. In one patient taking 1200 mg daily, a random milk level of 600 mcg/L was found.
Magnesium Sulfate

Summary of Use during Lactation:

Although intravenous magnesium sulfate given prior to delivery might affect the infant’s ability to breastfeed, intention to breastfeed may be a more important determinant of breastfeeding initiation.[1] Intravenous magnesium increases milk magnesium concentrations only slightly and oral absorption of magnesium by the infant is poor, so maternal magnesium therapy is not expected to affect the breastfed infant’s serum magnesium. Magnesium sulfate can be taken during breastfeeding and no special precautions are required.

Drug Levels:

Maternal Levels. Ten women with pre-eclampsia were given 4 grams of magnesium sulfate intravenously followed by 1 gram per hour until 24 hours after delivery. While the average serum magnesium was 35.5 mg/L in treated women compared to 18.2 mg/L in 5 untreated controls, colostrum magnesium levels at the time of discontinuation of the infusion was 64 mg/L in treated women and 48 mg/L in the controls. By 48 hours after discontinuation, colostrum magnesium levels were only slightly above control values and by 72 hours they were virtually identical to controls.[2]

Infant Levels. Relevant published information was not found as of the revision date.
Long induction...Eventual Cesarean Delivery for NRFHT at 7cm dilation

- Post operative pain management
- Blood pressure management
Mothers with normal term or older infants generally can resume breastfeeding as soon as they are awake, stable and alert.

Tool for consultation

- Anyone caring for mothers and babies
- Almost always a class of drug compatible with breastfeeding
- Goal is to preserve the breastfeeding relationship if possible
- Available on desktops and mobile devices
- Print information for families if concerned
Is this drug safe?
Immediate postpartum period vs. older baby

- Closure of tight junctions in mammary gland; “less leaky” as lactogenesis II occurs
- Larger molecules less able to pass through mammary epithelium
- Milk volume: drops vs. gallons
- Organ maturity of baby (liver and kidneys)
Open Junction vs. Closed Junction
Junctions close as alveolar cells swell several days after birth

Hale, Medications and Mothers' Milk, 2012
Qualities of meds to choose for lactating patients:

- Short half life
- Low concentrations in maternal plasma
- High in molecular weight
- High in protein binding
- Lipophobic
- Poor oral bioavailability
Drugs may transfer into milk if they:

- Attain high concentrations in maternal plasma
  - Route of administration
  - Absorption Rate
  - Half Life
- Are low in molecular weight
- Are low in protein binding
- Pass easily into the brain (lipophillic)
New scenario:

- 41 y/o P1 s/p complicated cesarean section after 3.5 hours of pushing
- Persistent fevers on POD 4, on IV antibiotics Ampicillin/Gentamicin/Clindamycin
- CT scan done with IV and PO contrast to r/o abscess
- Ovarian vein thrombosis is identified on the left
Patient and her family are very worried about breastfeeding in the setting of:

- Multiple Antibiotics
- CT contrast
- Blood Thinner
- Pain Medications

- They have been “Googling” everything!
Iodinated Contrast Media

Drug Levels and Effects:

Summary of Use during Lactation:

Intravenous iodinated contrast media are poorly excreted into breastmilk and poorly absorbed orally so they are not likely to reach the bloodstream of the infant or cause any adverse effects in breastfed infants. Guidelines developed by several professional organizations state that breastfeeding need not be disrupted after a nursing mother receives a iodine-containing contrast medium.\textsuperscript{[1][2][3]} However, because there is no published experience with iopromide during breastfeeding, other agents may be preferred, especially while nursing a newborn or preterm infant.
Coumadin

Drug Levels and Effects:

Summary of Use during Lactation:

Because of the very low milk levels with warfarin doses up to at least 12 mg daily, amounts ingested by the infant are small. No adverse reactions in breastfed infants have been reported from maternal warfarin use during lactation, even with a dose of 25 mg daily for 7 days. There is a consensus that maternal warfarin therapy during breastfeeding poses little risk to the breastfed infant.[1][2][3][4] No special precautions are necessary.
Ampicillin

Summary of Use during Lactation:

Ampicillin is acceptable to use during breastfeeding. Substantial information indicates that maternal doses of Ampicillin up to 4 grams daily produce low levels in milk that are not expected to cause adverse effects in breastfed infants. Occasionally, disruption of the infant’s gastrointestinal flora, resulting in diarrhea or thrush, has been reported with penicillins, but these effects have not been adequately evaluated.
Ampicillin

**Drug Levels:**

*Maternal Levels.* After an *ampicillin* oral dose of 500 mg every 6 hours for 3 days, milk levels fluctuated little and ranged from 0.575 to 1 mg/L (mean 0.8 mg/L) at various times in one mother and 0.014 mg/L to 0.0675 mg/L (average 0.03 mg/L) in another. [1]

In 10 mothers given *ampicillin* 1.5 or 2 grams daily by mouth for 3 doses had milk levels ranging from 0.03 to 0.2 mg/L. Another mother receiving 3 grams daily by mouth had milk levels of 0.08 to 0.3 mg/L. In 3 mothers who received 2 grams daily intramuscularly, milk levels ranged from 0.3 to 0.9 mg/L and in 3 mothers who received 4 grams daily intramuscularly had milk levels of 0.4 to 0.9 mg/L. In all cases, peak milk levels occurred 3 hours after the dose. The breastfed infant was estimated to receive from 0.08 to 0.2 mg daily of *ampicillin* with these doses. [2]

A study in postpartum women with endometritis who received *ampicillin* 1 or 2 grams infused intravenously over 20 minutes found the average milk levels of *ampicillin* to be 1.7 mg/L with the highest level observed 3 mg/L. [3]

In 15 women receiving *ampicillin* 500 mg 4 times daily by intramuscular injection, average milk *ampicillin* levels were as follows: 0.11 mg/L at 30 minutes after the injection; 0.21 mg/L at 1 hour, 0.17 at 2 hours, 0.27 mg/L at 4 hours and 0.26 mg/L at 6 hours after the injection. [4]
Ampicillin

Effects in Breastfed Infants:

An uncontrolled observation of the breastfed infants of mothers taking ampicillin noted a seeming increase in cases of diarrhea and candidiasis that was attributed to ampicillin in breastmilk. [7]

In a prospective follow-up study, 5 nursing mothers reported taking ampicillin (dosage unspecified). One mother reported diarrhea in her infant. No rashes or candidiasis were reported among the exposed infants.[8]

A small, controlled, prospective study had mothers monitor their infants for signs of adverse effects (furring of the tongue, feeding difficulties, changes in stool frequency and consistency, diaper rash, and skin rash). Weight change and the development of jaundice were also recorded. No statistical differences in these parameters were found between the infants of the control mothers and those of mothers taking ampicillin. [9]
LactMed FREE!
Conclusions

- Drug choices have implications on the mother/baby dyad
- LactMed is an excellent resource to help choose an appropriate medication in the inpatient setting
- Readily accessible
- Fast, easy to use
- Offers alternate options, almost always something to preserve lactation

- Teachable moments with other specialties, consultants, medical students and housestaff
Breastfeeding and Babies: How Can Pediatricians Help?

Natasha K. Sriraman, MD, MPH, FAAP, FABM
The Children’s Hospital of the King’s Daughters
Eastern Virginia Medical School
Division of General Academic Pediatrics
Norfolk, Virginia
Mother-Baby Dyad

- Many women will have 1-2 post-partum follow-up visits with OB
  - Minority women have poor postpartum OB follow-up
- Babies can see pediatrician 6-7 times within the first year of life!
- Usually, MOM brings in baby

Nature of relationship
- Trust
- Longevity
- Respect
Newborn Check-ups: 
So much in so little time...

- Parental Concerns
- Birth history/review of paperwork
- Newborn nursery course
- Maternal serologies
- Hepatitis serology & vaccination
- Blood types and ABO incompatibility
- Jaundice
- Birth measurements
- Today's measurements
- Feeding, stooling, voiding
- **Lactation support**
- Hearing screen
- Weight loss calculation
- Growth charts

- Physical Examination
- Congenital heart disease
- Developmental dysplasia of the hip
- Problem lists
- Medication lists
- Car seats
- Skin care, cord care, circ care
- Back to sleep
- Smoke alarms
- Water safety
- Sibling rivalry
- WIC
- Fever/illness signs/Sx
- Follow-up appointments
- Prescriptions
- Transportation
- Screen for maternal depression
- Social support systems
- Smoke exposure/cessation
Breastfeeding Education

- 70% mothers in US initiate breastfeeding/year
- Discuss breastfeeding problems with pediatrician
- Pediatricians may feel unsure about their role when assisting the non-patient, breastfeeding mother
- Need practical solutions and support systems as pediatricians can be instrumental in preventing early weaning
Fear of Maternal Medications

- Pediatric residents receive 3 hours of breastfeeding training per year
  - Academic Pediatrics 2011; Osband et al.

- Even less training on the effects of maternal medications on the nursing infant.
  - JAMA 1995; Freed et al

- Concern about potential harm to the nursing infant from maternal medications is often cited as a reason to advise discontinuation of breastfeeding
  - Breastfeeding, A Guide for Medical Professional, 6th Ed, 2005; Lawrence
Outpatient Scenario #1

- Mom G2P2 brings baby in to Pediatric clinic for 1 month check.
- When questioned about feeding, MD discovers that mom had left the hospital breastfeeding, but now stopped.
- When questioned, she said that when she was diagnosed with a sinus infection by her PCP, he told her that she had to stop breastfeeding or pump and dump since she was given a Rx for Z-pack.
- What’s next...
What to do for mom?

- If she is still motivated/interested in breastfeeding, give her tips for re-lactation. Since it’s only been a week, her milk supply may be low, but sufficient.
- If she continued to pump (and dump), great news! Tell her she can start nursing her infant immediately.
- Reassure her of the safety of the antibiotic.
- Alternatives
  - Timing of breastfeeding related to medication schedule
  - Give her the references/link for LactMed.
  - Print out the page of EFFECTS in infants—one for mom and one for her MD.
**Azithromycin**

CASRN: 83905-01-5

For other data, click on the Table of Contents

**Drug Levels and Effects:**

Chemical structure for Azithromycin

**Summary of Use during Lactation:**

Because of the low levels of azithromycin in breast milk and use in infants in higher doses, it would not be expected to cause adverse effects in breastfed infants. Monitor the infant for possible effects on the gastrointestinal flora, such as diarrhea, candidiasis (thrush, diaper rash). Unconfirmed epidemiologic evidence indicates that the risk of hypertrophic pyloric stenosis in infants might be increased by maternal use of macrolide antibiotics during breastfeeding.

**Effects in Breastfed Infants:**

A cohort study of infants diagnosed with infantile hypertrophic pyloric stenosis found that affected infants were 2.3 to 3 times more likely to have a mother taking a macrolide antibiotic during the 90 days after delivery. Stratification of the infants found the odds ratio to be 10 for female infants and 2 for male infants. All of the mothers of affected infants nursed their infants. Most of the macrolide prescriptions were for erythromycin, but only 7% were for azithromycin. However, the authors did not state which macrolide was taken by the mothers of the affected infants.[3]

A retrospective database study in Denmark of 15 years of data found a 3.5-fold increased risk of infantile hypertrophic pyloric stenosis in the infants of mothers who took a macrolide during the first 13 days postpartum, but not with later exposure. The proportion of infants who were breastfed was not known, but probably high. The proportion of women who took each macrolide was also not reported.[4]

A study comparing the breastfed infants of mothers taking amoxicillin to those taking a macrolide antibiotic found no instances of pyloric stenosis. However, most of the infants exposed to a macrolide in breast milk were exposed to roxithromycin. Only 10 of the 55 infants exposed to a macrolide were exposed to azithromycin. Adverse reactions occurred in 12.7% of the infants exposed to macrolides which was similar to the rate in amoxicillin-exposed infants. Reactions included rash, diarrhea, loss of appetite, and somnolence.[5]

Eight women who were given azithromycin 500 mg intravenously 15, 30 or 60 minutes prior to incision for cesarean section breastfed their newborn infants. No adverse events were noted in their infants.[2]

**Alternate Drugs to Consider:**

Clarithromycin, Erythromycin

**References:**

3. Sorensen HT, Skriver MV, Pedersen L et al. Risk of infantile hypertrophic pyloric stenosis after maternal postnatal...
Case Study #2

- 27 y/o woman G1P1, military wife, no family support. Doesn’t feel ‘right.’
- No PMHx of mood/anxiety disorders.
- No medications.
- Fearful to see mental health professional since “I don’t want to be put on medication since I don’t want to stop breastfeeding.”
- This is the one thing I can do for my baby...
AAP Clinical Report 2010

AAP clinical report:
Incorporating Recognition and Management of Perinatal and Postpartum Depression into Pediatric Practice (Pediatrics. 2010;126:1032-1039)

http://aapnews.aappublications.org/content/31/11/29.full.pdf
The #1 complication of childbirth is depression.

One in eight new moms has postpartum depression.
It is treatable! Call 1-800-944-4PPD (4773).

Extreme exhaustion, appetite and sleep disturbances, mood swings, anxiety, no motivation

Call your health care provider and contact us:
Postpartum Support International
www.postpartum.net
To Treat or Not to Treat

- Pregnant/lactating women routinely advised to discontinue medications
- Maternal sacrifice not advisable - “for the sake of the fetus/infant, just suck it up…”
- Mothers told to stop breastfeeding so they can resume psychiatric medications
  - “You breastfed for a month, that’s good enough. Let’s restart your Zoloft.”
- Maternal/fetal health seen at cross-purposes
Depression and Lactation: Considerations

- Depressed mothers
  - Less likely to breastfeed, more likely to quit
    - Failed lactation and perinatal mood disorders – shared neuroendocrine mechanisms?

- Breastfeeding difficulties → increased risk of depression
- No breastfeeding → increased risk of depression
ABM Clinical Protocol #18: Use of Antidepressants in Nursing Mothers

THE ACADEMY OF BREASTFEEDING MEDICINE PROTOCOL COMMITTEE

A central goal of The Academy of Breastfeeding Medicine is the development of clinical protocols for managing common medical problems that may impact breastfeeding success. These protocols serve only as guidelines for the care of breastfeeding mothers and infants and do not delineate an exclusive course of treatment or serve as standards of medical care. Variations in treatment may be appropriate according to the needs of an individual patient.
SSRIs

- Most commonly used
- Best safety profile
- Older meds
- More studies
- More efficacious
- Less side effects
- Treats symptoms of both anxiety AND depression
Sertraline has caused galactorrhea in nonpregnant, nonnursing patients. However, in a study of cases of hyperprolactinemia and its symptoms (e.g., gynecomastia) reported to a French pharmacovigilance center, sertraline was not found to have an increased risk of causing hyperprolactinemia compared to other drugs. The prolactin level in a mother with established lactation may not affect her ability to breastfeed.

A midwife observed 8 patients who reported a decrease in milk supply after starting sertraline (dosages not reported). One of the mothers had been taking sertraline since the 6th month of pregnancy. She reported an increase in milk supply when she stopped sertraline for one week at 4 months postpartum. When she restarted sertraline, her milk supply reportedly decreased. In all of the women, the milk supply increased in 2 to 3 days after increasing fluid and the frequency of nursing.

In a small prospective study, 8 primiparous women who were taking a serotonin reuptake inhibitor (SRI; 3 taking fluoxetine and 1 each taking citalopram, duloxetine, escitalopram, paroxetine, or sertraline) were compared to 423 mothers who were not taking an SRI. Mothers taking an SRI had an onset of milk secretion activation (lactogenesis II) that was delayed by an average of 18.7 hours compared to controls (85.8 hours postpartum in the SRI-treated mothers and 68.1 h in the untreated mothers), which doubled the risk of delayed feeding behavior in the untreated group. However, the delay in lactogenesis II may not be clinically important, since there was no statistically significant difference between the groups in the percentage of mothers experiencing feeding difficulties after day 4 postpartum.

**Effects on Lactation and Breastmilk:**

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**Summary of Use during Lactation:**

Because of the low levels of sertraline in breastmilk, amounts ingested by the infant are small and is usually not detected in the serum of the infant, although the weakly active metabolite desmethylsertraline is often detectable in low levels in infant serum. Rarely, preterm infants with impaired metabolic activity might accumulate the drug and demonstrate symptoms similar to neonatal abstinence. Most authoritative reviewers consider sertraline one of the preferred antidepressants during breastfeeding (19)(20)(21)(22) Mothers taking an SSRI during pregnancy and postpartum may have more difficulty breastfeeding and may need additional breastfeeding support.
Concerns of mother

- Risks of early weaning vs. Risks of not-treating
- LactMed information
- Handouts for her PSYCHIATRIST
- Collaboration with adult physician, OB, and/or mental health physician to work together with pediatrician to help mother meet her breastfeeding goals
Just say NO!
FDA Proposed Changes: Lactation Subsection

- Risk summary
  - Statement whether use of drug compatible with breastfeeding
  - Effects on milk production
  - Presence in human milk?
    - Quantified
  - Effects on breast-fed child

- Clinical Considerations
  - Ways to minimize exposure
    - Timing of doses, "Pump and dump"
  - Monitoring
  - Dose adjustments in lactation

- Proposed since 2011
A Breastfeeding-Friendly Approach to Depression in New Mothers

Curriculum and Resource Guide for Health Care Providers

The New Hampshire Breastfeeding Task Force

www.NHBreastfeedingTaskForce.org
Other Resources

- UpToDate (fee) -
- Marcé Society for Perinatal Mental Health
  - Paris Meeting with PSI - October 2012
  - Listserve (members only)
- MGH Center for Women’s Mental Health
  - [www.womensmentalhealth.org](http://www.womensmentalhealth.org)
  - Subscribe to blog postings
- Lactation Study Center (Rochester, NY) (585) 275-0088
  - Staffed 40 hours a week
## Safety of Antidepressant Medications for Breastfeeding Mothers

<table>
<thead>
<tr>
<th>Medication</th>
<th>Lactation Risk Category*</th>
<th>Theoretical &amp; Relative Infant Dose</th>
<th>Peak in Mother's Plasma</th>
<th>Protein binding</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoxetine (Prozac)</td>
<td>L2 for older infants L3 for neonates</td>
<td>57µg/kg/day; 6.8%</td>
<td>1.5-12 hours (peak at 6 hours)</td>
<td>94.5%</td>
<td>Approved by AAP for use during pregnancy but some caution during lactation. Active metabolites.</td>
</tr>
<tr>
<td>Paroxetine (Paxil)</td>
<td>L2</td>
<td>15.2µg/Kg/day; 2.1%</td>
<td>5-8 hours (peak at 4 hours)</td>
<td>95%</td>
<td>Inactive metabolite. Preferable to Prozac.</td>
</tr>
<tr>
<td>Sertraline (Zoloft)</td>
<td>L2</td>
<td>21.4µg/Kg/day; 2.2%</td>
<td>7-8 hours</td>
<td>98%</td>
<td>Metabolite (desmethylsertraline) is inactive. Preferable to Prozac.</td>
</tr>
<tr>
<td>Citalopram (Celexa)</td>
<td>L2</td>
<td>14.6µg/Kg/day; 3.6%</td>
<td>2-4 hours</td>
<td>80%</td>
<td>Active metabolite.</td>
</tr>
<tr>
<td>Escitalopram (Lexapro)</td>
<td>L2</td>
<td>7.6 µg/kg/day; 5.3%</td>
<td>5 hours</td>
<td>56%</td>
<td>Levels in infants too low to be detected. Preferred over citalopram.</td>
</tr>
<tr>
<td>Venlafaxine (Effexor)</td>
<td>L3</td>
<td>0.29mg/kg/day; 6.4%</td>
<td>2.25 (milk)</td>
<td>27%</td>
<td>Some concern about adverse effects on babies exposed in utero.</td>
</tr>
<tr>
<td>Bupropion (Wellbutrin)</td>
<td>L3</td>
<td>28.4µg/Kg/day; 0.6-2%</td>
<td>2 hours</td>
<td>75-88%</td>
<td>May concentrate in human milk. Do not use in patients with history of seizure.</td>
</tr>
<tr>
<td>Amitriptyline (Elavil)</td>
<td>L2</td>
<td>21µg/Kg/day; 1.5%</td>
<td>2-4 hours</td>
<td>94.8%</td>
<td>Although AAP listed as “may be of concern,” is probably safe to use.</td>
</tr>
<tr>
<td>Imipramine (Tofranil)</td>
<td>L2</td>
<td>4.35µg/Kg/day; 0.15%</td>
<td>1-2 hours</td>
<td>90%</td>
<td>Could accumulate in infant plasma levels, although none have been reported. Infant should be monitored closely.</td>
</tr>
<tr>
<td>Nortriptyline (Pamelor)</td>
<td>L2</td>
<td>27 µg/Kg/day; 1.5%</td>
<td>7-8.5 hours</td>
<td>92%</td>
<td>Several authors have not been able to detect NT in maternal milk or infant serum.</td>
</tr>
<tr>
<td>Hypericum (St. John’s wort)</td>
<td>L2</td>
<td>Low to undetectable.</td>
<td>5.9 hours</td>
<td>Unknown</td>
<td>No adverse effects noted. Undetected in infant plasma.</td>
</tr>
<tr>
<td>Mirtazapine</td>
<td>L3</td>
<td>8 µg/kg/day; 1.9%</td>
<td>2 hours</td>
<td>85%</td>
<td>Infant plasma levels too low to be detected. Probably safe.</td>
</tr>
</tbody>
</table>

Future physicians

- Regardless of specialty, ALL trainees/residents should know about LactMed
- Medical students
- PA students
- Nursing Students
- Residents
  - Pediatrics, OB, IM, FP, Psychiatry, Radiology, ER, Surgery
- Download during lectures, rotations, etc. (Yes, I do tell them to download during my lecture!)
There's a FREE App for that!

LactMed
@NIH
Version 1.0.1

Looking for information about drugs and breastfeeding? LactMed has information about maternal and infant drug levels, possible effects on lactation and on breastfed infants, and alternative drugs to consider.

Drug Name Search

Drug Class Search
Questions for the panel
Additional Information

For additional information on the topics discussed in this webinar:

- E-mail lactation@aap.org
- Visit www.aap.org/breastfeeding
- Visit www.acog.org
Post Survey Email and Recording

- A post-survey link will be sent to you once the Webinar concludes. Please complete. Your feedback is valuable to us.

- The Webinar will be available as a recording at www.aap.org/breastfeeding.

THANK YOU!