

Pediatric Pharmacy Advocacy Group

If I take this medication,
is it safe to breastfeed?



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1

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Medications and Breastfeeding

- Breastfeeding women take more medication than pregnant women
- Post-partum women use on average four different non-prescription and prescription medications while breastfeeding (0.9 medications per month)
 - 33% were prescribed and 66% self-administered
 - Mostly analgesics, contraceptives, antimicrobials and cough/cold/allergy
 - Some labeled as potentially unsafe to use (diazepam, codeine)
- More than 50% of postpartum women require at least one medication
 - Mostly contraceptives, antimicrobials, analgesics, NSAIDs
 - Medication use for thyroid disease, epilepsy, or infections can be associated with lower initiation and/or duration of breastfeeding




2

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Objectives

- Describe how medications may influence human milk production
- List at least three factors that influence drug transfer into human milk
- Compare and contrast drug information resources for medication use in breastfeeding
- Describe the updated lactation section of a medication package insert
- Interpret data on fetal risk from medications transferred via human milk




3

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Rachel

- Rachel brings her 8-month-old infant in to the clinic for a fever and congestion. Rachel also has congestion and fever. Both mom and infant have a viral illness. Rachel asks you if she can take ibuprofen and pseudoephedrine while breastfeeding.
- Can she take ibuprofen?
- Can she take pseudoephedrine?



4

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LACTATION


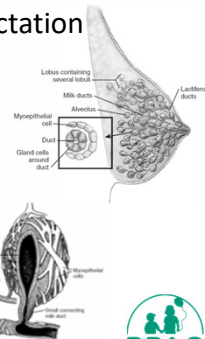


5

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Physiology of Lactation

- Mammary gland synthesizes milk
 - Specialized alveolar cells
 - Create and control breast milk composition
 - Specialized myoepithelial cells
 - Surround alveolar cells and ducts
 - Control milk let down
- Ductule system
 - Drain alveoli; small ducts coalesce into main ducts that open directly onto nipple




6

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Hormonal Effects on Lactation

- Prolactin
 - Stimulates milk production by the alveolar cells; hypertrophy and development of tight junctions
 - Release inhibited by dopamine; stimulated by suckling
- Oxytocin
 - Stimulates myoepithelial cells to contract resulting in milk let down
 - Released in response to suckling, psychological influences
- Estrogen
 - Inhibits prolactin release
 - Estrogen levels drop dramatically after birth removing negative influence on lactation




7

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Local Effects on Lactation

- Suckling
 - Shown to increase prolactin and oxytocin release
- Nonneural secretion of serotonin
 - Formerly called the feedback inhibitor of lactation
 - Secreted into milk
 - Accumulates if milk not removed; stimulates alveolar cells to inhibit further milk secretion
- Myoepithelial stretch
 - Decreased milk production




8

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Other Effects on Lactation


- Inadequate fluid intake by mother
- Emotional or physical stress or pain inhibits oxytocin release
- Medications



9

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MEDICATIONS AND LACTATION




10

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Influencing Lactation: Galactogogues

- Stimulate breast milk production
 - Metoclopramide
 - 5-15mg TID X 2 weeks increases breastmilk production
 - Inhibits dopamine (thus increase prolactin)
 - Onset of effects 4-6 days
 - Oxytocin
 - 1 spray intranasal prior to feeding/pumping increases milk let down 3-5X baseline
 - Onset 2-5 days




Source: OM, Metoclopramide. J Midwifery Womens Health. 2006; 15(4):202-212.

11

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Influencing Lactation: Herbs*

- Fenugreek
 - Most commonly recommended product
 - “Hormone precursors” stimulate milk production
 - Theorized to stimulate sweat production
 - 3 caps TID recommended; effects 2-3 days
 - No formal clinical studies
 - Can discontinue once have adequate milk supply
 - Avoid in patients with pea/peanut allergies
 - Can use as adjunct with other medications




Source: OM, Galactogogues. J Midwifery Womens Health. 2006; 15(4):202-212.

12

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Influencing Lactation: Herbs*

- Shatavari (related to asparagus)
- Milk thistle
- Blessed thistle
- Fennel
- Brewer's yeast
- Raspberry leaf
- Flax seed
- *No herbal product has been proven to affect milk production




Revised 06/2018. Adapted from: J Midwifery Women's Health. 2008; 17(4):202-214.

13

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Influencing Lactation: Inhibition of Milk Production

- Inhibition of prolactin release
 - Bromocriptine, ergotamine (dopamine agonists)
 - Not recommended due to adverse effects although very efficacious
 - FDA removed lactation indication on bromocriptine
 - Cabergoline, 1mg post-partum or 0.25mg q12 x 2 days
 - Estrogens (dose-dependent, time-dependent)
 - Anticholinergics/Antihistamines
 - Sympathomimetic medications




Adapted from: Drug Use and Lactation. In: Briggs GD, Nguyen M, editors. Chemical, Pharmacokinetic, and Drug Therapy in Lactation: A Guide to Compatible and Incompatible Medication. Society of Toxicology. Bethesda, MD: 2009. p. 40-44.

14

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Influencing Lactation: Inhibition of Milk Production

- Inhibition of oxytocin release/inhibits suckling-induced prolactin response
 - Alcohol
- Others
 - Thiazide diuretics (High doses)




Adapted from: Drug Use and Lactation. In: Briggs GD, Nguyen M, editors. Chemical, Pharmacokinetic, and Drug Therapy in Lactation: A Guide to Compatible and Incompatible Medication. Society of Toxicology. Bethesda, MD: 2009. p. 40-44.

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Rachel

- Was Rachel concerned about infant issues, breastmilk issues, or both?
- Ibuprofen?
- Pseudoephedrine?




16

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Case- Paige


- Text from friend:
- Paige is a 28-year-old female, currently breastfeeding her 4-month-old son
- She has seasonal allergies and takes cetirizine as needed for symptoms
- She asks: "Will Zyrtec hurt Brooks if I take it?"



17

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DRUG TRANSFER INTO BREASTMILK




18

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Factors of Drug Transfer into Breastmilk

- Size of molecule/molecular weight
- Solubility in water and lipids
- Ionization
- Plasma protein binding
- pH of drug
 - Plasma pH: 7.4
 - Milk pH: 6.8-7.0
- Diffusion rates




Illustrated: PO, Drug, Milk and Lactation. In: Briggs GS, Freeman M, editors. *Drugs, Lactation and Drug Transfer in Humans: A Guide to Safe Practice*. Elsevier, Amsterdam, 2012. Chapter 10, pp. 215-220.

19

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Mechanisms of Drug Transfer

- Passive diffusion
 - Unionized, free drug diffusion down concentration gradient
 - Low MW pass through small pores
 - Diffusion of lipid soluble substances across lipid membranes
 - Retrograde diffusion responsible for elimination of drug
- Carrier-mediated/Active transport
 - Energy dependent transport of molecules across membranes
- Ion-trapping
 - Milk more acidic than plasma; weak bases cross easily and become ionized in milk “trapped”



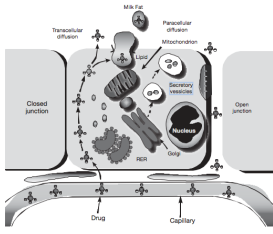

Illustrated: PO, Drug, Milk and Lactation. In: Briggs GS, Freeman M, editors. *Drugs, Lactation and Drug Transfer in Humans: A Guide to Safe Practice*. Elsevier, Amsterdam, 2012. Chapter 10, pp. 215-220.

20

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Drug Factors Favoring Transfer

- Unionized state
- High lipid solubility
- Low molecular weight
- Low protein binding
- Weak base





Illustrated: PO, Drug, Milk and Lactation. In: Briggs GS, Freeman M, editors. *Drugs, Lactation and Drug Transfer in Humans: A Guide to Safe Practice*. Elsevier, Amsterdam, 2012. Chapter 10, pp. 215-220.

21

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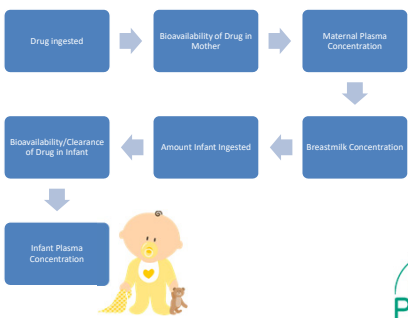
DETERMINING INFANT EXPOSURE




22

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Key Factor to Consider- The Infant



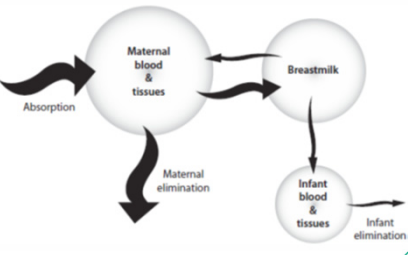
Drug ingested → Bioavailability of Drug in Mother → Maternal Plasma Concentration → Breastmilk Concentration → Amount Infant Ingested → Bioavailability/Clearance of Drug in Infant → Infant Plasma Concentration



23


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Pharmacokinetic Model



Absorption → Maternal blood & tissues → Breastmilk → Infant blood & tissues → Infant elimination

Maternal blood & tissues → Maternal elimination




24

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Milk:Plasma Ratio

- M:P ratio = $\frac{\text{concentration in milk}}{\text{concentration in plasma}}$
- Uses the AUCs of maternal plasma and breastmilk drug concentrations
- Ratio varies over time
 - Best to calculate using peak concentrations if doing single point concentration
- Drugs with high M:P ratio reach higher concentrations in milk than plasma




Address: P.O. Box 2000, St. Louis, MO 63101-2000
Phone: (314) 435-2000

25

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Milk:Plasma Ratio

- Preferred ratio <1
- Ratio >1-5 = drug may stay in milk in high levels
- M:P ratios
 - 60% of drugs M:P ratio < 1
 - Aspirin 0.08
 - 25% of drugs M:P ratio 1-2
 - Acetaminophen 1.4
 - 15% of drugs M:P ratio > 2
 - Ranitidine 6.7, Diazepam 2.7




In St. Drug Therapy for Breastfeeding women
in St. Louis, MO, 2000 and 2000-2000

26

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Estimating Infant Exposure

- Infant daily dose (mg/day)=
 $C_{\text{milk}} \text{ (mg/ml)} \times \text{Pt Wt (kg)} \times V \text{ (ml/kg/day)}$
- $C_{\text{milk}} = \text{Serum } C_{\text{avg}} \times \text{M:P ratio}; V = 150 \text{ ml/kg/day}$
- Can compare daily infant dose from breastfeeding with infant dose from peds dosing reference



In St. Drug Therapy for Breastfeeding women
in St. Louis, MO, 2000 and 2000-2000


27

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Estimating Infant Exposure

- Relative Infant Dose (RID):

$$\frac{\text{Daily infant dose (mg/kg/day)}}{\text{Daily maternal dose (mg/kg/day)}} \times 100 = \%$$
 - Generally safe if infant exposed to <10% of dose
 - For psychotropic medication < 5% is safe (Denmark Working Group)
 - Avoid medication if >25% (WHO Working Group)
 - Does not take into account the infant's clearance rate of the drug
 - Listed commonly in drug information references




Anderson PD, Sutherland B. Estimating drug passage via human milk. Clin Pharmacol Ther. 2014;95:1007-1012.

28

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Example Calculation: Infant Exposure

- Mother taking sertraline 100 mg PO dose; 5 kg infant
 - Drug Conc in Milk= 0.173 mcg/ml
- Dose infant (mg/day)=
 - $C_{\text{milk}} \text{ (mg/ml)} \times \text{Pt Wt (kg)} \times V \text{ (ml/kg/day)} =$
 - 0.173 mcg/ml X 5 kg X 150 ml/kg/day = 129.75 mcg/day
 - 25.9 mcg/kg/day
 - 0.026 mg/kg/day
 - Maternal daily dose: 1.4 mg/kg/day (70 kg mother)
 - RID= 0.026/1.4 x 100% = 1.8%
 - <10% normal drug exposure




29

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Infant Considerations

- Age
 - Changes in absorption, metabolism and clearance
- Underlying health status
 - Prematurity
 - Renal/hepatic function
 - Glucose-6-phosphate dehydrogenase deficiency
- Infant feeding behaviors
 - Suckling behavior
 - Feeding times/intervals
 - Introduction of solid foods




Anderson PD. Drug Use and Lactation. In: Briggs GG, Freeman M, editors. Drugs, pregnancy, lactation, and drug therapy. Oxford: Elsevier; 2012. p.24-33.

30

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Maternal Considerations

- Health status
- Lactation
 - Degree of establishment of lactation
 - Colostrum, mature milk
 - Complications: Mastitis
 - Tight junctions between epithelial cells leak; allow greater transfer of molecules
- Pharmacogenomics differences
 - 2D6 ultra metabolizers
 - 2C19 poor metabolizers
- Maternal serum concentrations
 - Drug dose, half-life, route of administration, frequency of dosing

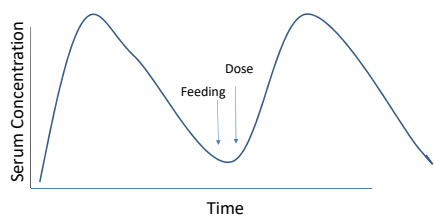



Anderson PD. Drug Use and Lactation. In: Briggs GD, Ripstein M, editors. Diseases, complications, and Drug Therapy in Pregnancy and Lactation. Baltimore, Maryland: Society of Obstetricians, Gynecologists and Neonatologists; 2009. p.202-204.

31

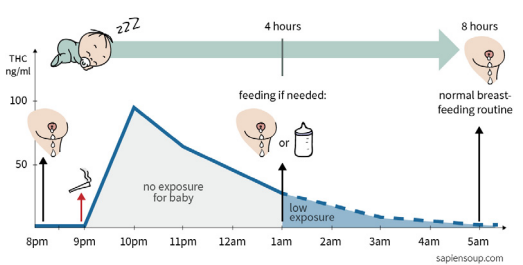

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Timing of Feedings

32

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33

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LACTATION RESOURCES




34

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Resources


- What resources would you use to answer Rachel's and Paige's question?
- What resources would Rachel or Paige use?



35

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PACKAGE INSERT




36

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Pregnancy and Lactation Labeling Rule (PLLR)

- Final Rule approved by FDA in December 2014
 - Went into effect on June 30, 2015
 - FDA Categories/Labeling Changes
 - Changes content and format of prescription and biologic labeling information
 - Removes A, B, C, D and X Pregnancy categories from all product labeling
 - Requires labels to be updated when outdated
 - Labeling for over-the-counter (OTC) medicines did not change




37

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Pregnancy and Lactation Labeling Rule

Prescription Drug Labeling Sections 8.1 – 8.3 USE IN SPECIFIC POPULATIONS

CURRENT LABELING	NEW LABELING (effective June 30, 2015)
8.1 Pregnancy	8.1 Pregnancy Includes Labor and Delivery
8.2 Labor and Delivery	8.2 Lactation Includes Nursing Mothers
8.3 Nursing Mothers	NEW 8.3 Females and Males of Reproductive Potential



38


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Pregnancy and Lactation Label Outline

8.2 Lactation

- Risk Summary
 - Presence of drug in human milk*
 - Effects of drug on the breast-fed child*
 - Effects of drug on milk production*
 - Risk and benefit statement*
- Clinical considerations
- Data


* If drug absorbed systemically



39

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PLLR Implementation Plan	
Applications required to conform to new pregnancy/lactation content requirements	Time by which labeling with new pregnancy/lactation content must be submitted to FDA for approval
New or Pending Applications	
Applications submitted on or after June 30, 2015	Time of submission.
Applications pending on June 30, 2015	4 years after the effective date of pregnancy final rule or at time of approval, whichever is later.
Approved Applications Subject to the Physician Labeling Rule	
Applications approved any time from June 30, 2001, up to and including June 29, 2002, and from June 30, 2005, up to and including June 29, 2007	3 years after the effective date of pregnancy final rule.
Applications approved any time from June 30, 2007, up to and including June 30, 2015	4 years after the effective date of pregnancy final rule.
Applications approved from June 30, 2002, up to and including June 29, 2005	5 years after the effective date of pregnancy final rule.
Applications approved prior to June 30, 2001	Removal of previous category required but use of new format is not required




40

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Baxdela (delafloxacin) Package Insert

- 8.2 Lactation
- Risk Summary
- There are no data available on the presence of delafloxacin in human milk, the effects on the breast-fed infant, or the effects on milk production. Delafloxacin is excreted in the breast milk of rats [see [DATA](#)]. The developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for BAXDELA and any potential adverse effects on the breast-fed child from BAXDELA or from the underlying maternal condition.
- Data
- After single oral dose of 20 mg/kg (approximately 194 mg for a 60 kg patient) 14C labeled delafloxacin on post-natal day 11, the radioactivity was transferred into the milk of lactating rats. The mean milk/plasma radioactivity concentration ratios in dams at 4 and 8 hours after dosing were 8.5 and 4.0, respectively, and essentially background by 24 hours. The rate of elimination of radioactivity was similar in milk and plasma. Absorption of radioactive drug by rat pups following nursing was observed.




41

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Tylenol with Codeine Example Labeling


- Nursing Mothers
- Acetaminophen is excreted in breast milk in small amounts, but the significance of its effects on nursing infants is not known. Because of the potential for serious adverse reactions in nursing infants from acetaminophen, a decision should be made whether to discontinue the drug, taking into account the importance of the drug to the mother.
- Codeine is secreted into human milk. In women with normal codeine metabolism (normal CYP2D6 activity), the amount of codeine secreted into human milk is low and dose-dependent. Despite the common use of codeine products to manage postpartum pain, reports of adverse events in infants are rare. However, some women are ultra-rapid metabolizers of codeine. These women achieve higher-than-expected serum levels of codeine's active metabolite, morphine, leading to higher-than-expected levels of morphine in breast milk and potentially dangerously high serum morphine levels in their breastfed infants. Therefore, maternal use of codeine can potentially lead to serious adverse reactions, including death, in nursing infants.
- The risk of infant exposure to codeine and morphine through breast milk should be weighed against the benefits of breastfeeding for both the mother and baby. Caution should be exercised when codeine is administered to a nursing woman. If a codeine-containing product is selected, the lowest dose should be prescribed for the shortest period of time to achieve the desired clinical effect. Mothers using codeine should be informed about when to seek immediate medical care and how to identify the signs and symptoms of neonatal toxicity, such as drowsiness or sedation, difficulty breastfeeding, breathing difficulties, and decreased tone, in their baby. Nursing mothers who are ultra-rapid metabolizers may also experience overdose symptoms such as extreme sleepiness, confusion or shallow breathing. Physicians should closely monitor mother-infant pairs and notify treating pediatricians about the use of codeine during breastfeeding (see WARNINGS, DEATH RELATED TO ULTRA-RAPID METABOLISM OF CODEINE TO MORPHINE).



42

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**LITERATURE, TEXTBOOKS,
DATABASES, AND APPS**




43

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**American Academy of Pediatric (AAP)
Recommendations**

- The Transfer of Drugs and Other Chemicals Into Human Milk (2001)
 - Statement retired in 2010
- The Transfer of Drugs and Therapeutics Into Human Breast Milk: An Update on Select Topics (2013)
 - Psychotropic medications
 - Substance use treatments
 - Narcotics
 - Galactagogues
 - Herbal products
 - Immunizations
 - Statement reaffirmed Sept 2018
- Free Access Online to PDF articles




American Academy of Pediatrics Committee on Drugs. Transfer of drugs and other chemical substances into breast milk. 2001;99(10):1314-18.
Committee on Drugs. The Transfer of Drugs and Therapeutics into Human Breast Milk: An Update on Select Topics. Pediatrics. 2013;132(5):e146-58.
© 2013 American Academy of Pediatrics

44

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WHO

- World Health Organization (WHO)/UNICEF-
Breastfeeding and Maternal Medication
- Published in 2002
- Recommendations for drugs in the 11th WHO model
list of essential drugs
 - Provides brief data
- Free Access Online to PDF article



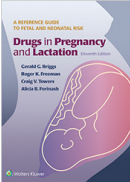

WHO/UNICEF. Breastfeeding and Maternal Medication. 2002.
© 2002 World Health Organization

45

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Briggs Drugs in Pregnancy and Lactation

- 11th edition
- Includes >1,200 commonly prescribed drugs
- Breastfeeding Recommendation in Header
 - 7 categories: compatible to contraindicated
- Breastfeeding Summary
 - May include case reports, pharmacokinetics
 - May include AAP recommendation







46

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Medication and Mother's Milk

- 19th Edition, 2019
 - Book updated every 2-3 years, annual online subscription/app available
 - Author: Thomas Hale, RPh, Ph.D
 - Includes >1,300 prescription, OTC, radiologic drugs, and vaccines
 - Details of studies and below info provided
- -Uses
- -AAP Recommendations
- -Summary of Use During Lactation
- -Pregnancy Risk Category (FDA)
- -Lactation Risk Category (His Own)
- -Adult and Pediatric Concerns
- -Drug Interactions
- -Relative Infant Dose
- -Adult Dose Pharmacokinetics
- -Alternative Drugs to Consider

47

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ESICHALOPRAM

Trade Name:
Category: Antidepressant, SSRI

L1BC1 - L2 - Limited Data/Probably Compatible

Escitalopram is a selective serotonin reuptake inhibitor (SSRI) used in the treatment of depression. It is the active R-enantiomer of citalopram (Citalopram). While this agent is very specific for the serotonin receptor site, it does appear to have a number of other side effects which may be related to inhibition of other receptors. Antagonism of muscarinic, histaminergic, and adrenergic receptors has been hypothesized to be associated with various anticholinergic, sedative and cardiovascular side effects.

In a case report of a 32 year old mother taking escitalopram (7 mg/day) while breastfeeding her newborn, the reported milk level was 28.9 ng/mL at one week postpartum. The infant's daily dose was estimated to be 3.78 µg/kg. At 7.5 weeks of age, the mother was taking 10 mg/day and the milk concentration level was 76.1 ng/mL. The infant daily dose was 11.4 µg/kg. There were no adverse events reported in the infant.

In a recent study of eight breastfeeding women taking an average of 10 mg/day, the milk relative infant dose of escitalopram and its metabolite was reported to be 3.7% of the mother dose. The mean MFR ratio (MFR) was 2.2 for escitalopram and 2.2 for desmethylcitalopram. Absolute infant doses were 7.8 µg/kg/day for escitalopram and 3 µg/kg/day for desmethylcitalopram. The drug and its metabolite were undetectable in most of the infants tested. No adverse events in the infants were reported.

These data suggest that in one series that full-term pregnant women taking escitalopram breastfed. The seven newborn infants were followed for up to 4 months postpartum and no adverse events occurred in the two breastfed infants.

Parameter	Value
MFR	2.2
DDI	3.7%
DDI	3.7%
DDI	3.7%
DDI	3.7%
DDI	3.7%
DDI	3.7%

Adult Concerns: Headache, insomnia, somnolence, dizziness and nausea. This medication has also been found to cause a prolonged QTc interval and a higher risk of developing Torsades de Pointes, especially when other medications that can also prolong QTc are used in combination with this product.

Adult Dose: 10-20 mg daily.


Pediatric Concerns: There is one case report of an infant exposed to escitalopram in pregnancy and lactation who developed neonatal encephalopathy (NNE). The authors of this report propose multiple mechanisms for SSRI's potentially increasing the risk of NNE including: withdrawal of SSRI leading to a hyporeactive state, vasoconstriction on smooth muscle in the gastrointestinal tract and inhibiting nitric oxide production. In this case report the infant was exposed to the medication in utero and via milk, had a 3 day admission to NICU for respiratory distress and then the adverse event occurred on day 5 of life. Other potential causes and in-utero exposure also need to be considered in this case.

Infant Monitoring: Satiety or irritability, not waking to feed/poor feeding and weight gain.

Alternative: Sertraline, Fluoxetine.

References:



1. Carling L, Sargent O. Escitalopram in Breast Milk. *J Clin Psychopharm* 2006; 26(3):315-316.
2. Rongjongs J, Jhaan L, Krittaman BK, Kaban R, Page Sheng M, Liu RP. Transfer of escitalopram and its metabolite desmethylcitalopram into breastmilk. *Int J Clin Ther* 2016; 39(1):10-12.
3. Bellon-Cramer C, Bross F, Oswald L. Safety of escitalopram in pregnancy: a case series. *Neurodevelopmental Disorder and Treatment* 2013;10:133-37.
4. Park AJ, Young RJ, Carter BS, Shinn JF. Neonatal encephalopathy associated with in utero and breast milk exposure to the selective serotonin reuptake inhibitor, escitalopram. *Journal of Perinatology* 2007;27:139-33.



48

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- Mommy Meds for Mothers
 - Data based on research of Dr. Hale and InfantRisk Center
 - Developed by Texas Tech University
 - Presented In layman's terms
 - Paid app for Apple or Android, ~\$3.99
- Infant Risk for Health Care Providers
 - MommyMeds Pro
 - Developed by Texas Tech University
 - Paid app, yearly charge, \$9.99

49

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ESCITALOPRAM
 Trade Names: Lexapro
 Overall Rating: Unknown, risk to the fetus cannot be ruled out

UNUSUAL DRUGS **BIRTH**


DRUG TYPE: Antidepressant
TRADE NAMES: Lexapro
LACTATION RISK: L2 - Limited Data-Probably Compatible
PREGNANCY RISK: P3 - Unknown, risk to the fetus cannot be ruled out
SIDE EFFECTS: Headache, insomnia, somnolence, diarrhea and nausea. This medication has also been found to cause a prolonged QTc interval and a higher risk of developing Torsades de Pointes, especially when other medications that can also prolong QTc are used in combination with this product.
ALTERNATIVE MEDS: Sertraline, fluoxetine.




50

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LactMed



- Free database through National Library of Medicine (<http://toxnet.nlm.nih.gov/newtoxnet/lactmed.htm>)
- Free app available (Apple/Android)
- Updated monthly
- Provides
 - Summary of use during lactation
 - Case reports and studies
 - Drug levels
 - Effects in breastfeeding infants
 - Possible effects on lactation
 - Alternative drugs to consider




51

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Databases

- LexiComp App/Online (subscription required)
 - Pregnancy and Lactation, In-Depth Database
 - Breastfeeding Considerations
 - Summary
 - Issues related to infant
 - Issues related to mother
 - Access to Briggs Drugs in Pregnancy and Lactation (online only)
 - Same content as book
- Epocrates (free app with registration)
 - Pregnancy/Lactation Section for all drug monographs
 - Short clinical summaries which include recommendations for use during breastfeeding, potential risks to an infant, and potential effects on breast milk production



52

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What best resource to use?

- What do you have access to?
 - Free/Paid
 - Computer/App
- What monograph gives you the info you need, in a format you like?




53

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Rachel

- Ibuprofen:
 - AAP Guidelines: No reported sign or symptom in infant or effect on lactation
 - WHO: Compatible with breastfeeding
 - Briggs: Compatible; does cross into breastmilk; 1 case study: RID=0.008%
 - Mother’s Milk: L1 (Safest); Extensive data-compatible; RID: 0.1-0.7%
 - LactMed: Preferred analgesic/anti-inflammatory due to low levels in breastmilk, short half-life, and safe use in infants; RID: 0.6%
 - Lexi-Comp: present in breastmilk; RID: 0.6-0.9%; adverse events not reported in breastfeeding infants; milk production not affected
 - ePocrates: NSAID of choice; no known infant harm or adverse effects on milk production based on human data
 - MommyMeds: 0-6, 6-12, 12+ months; L1- Extensive data- compatible; ideal analgesic in breastfeeding mothers




54

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Rachel

- Pseudoephedrine:
 - AAP Guidelines: No reported sign or symptom in infant or effect on lactation, drug does concentrate in breastmilk
 - WHO: Not included
 - Briggs: Limited human data- Probably Compatible; excreted into breastmilk, case series and small study described; RID=0.5-0.7% and 4.3%
 - Mother’s Milk: L3-Limited Data- Probably compatible; secreted into breastmilk in low levels; RID: 4.7%; reduced milk production has been reported in late stages of lactation
 - LactMed: Small amounts in breastmilk, may cause irritability in infant; single dose causes decrease in milk productions acutely, repeated use interferes with lactation; avoid if milk production not well established or insufficient production; RID: 2.2%-6.7%
 - Lexi-Comp: present in breastmilk; RID: 6.7%; irritability and agitation reported in breastfeeding infants; acute decrease in milk production; some expert recommend use for maternal hypergalactia
 - ePocrates: may occasionally use; consider alternative if poor milk production; no known infant harm based on limited human data; decreased milk production based on limited human data
 - MommyMeds: 0-6 and 6-12 months: L3-probably compatible; 12+ month: L4- limited data, possibly hazardous- should avoid or use caution, reduction in breastmilk in late-stage lactation




55

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Patient- Paige

- Can she take cetirizine with breastfeeding?
 - Briggs: No published reports describing use in human lactation; low molecular weight; exposure to infant is unknown but sedation is possible
 - Mother’s Milk: L2- No data-Probably Compatible; No reported concerns but observe for sedation
 - LactMed: Small occasional doses probably acceptable; larger doses or prolonged use may cause drowsiness in infant or decrease milk supply particularly with a sympathomimetic
- Is there a safer option?
 - Mother’s Milk: Alt drugs: Loratidine, desloratidine
 - LactMed: Alt drugs: desloratidine, fexofenadine, loratadine




56

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Patient- Paige

- 2 months later Paige returns and is diagnosed with post-partum depression
- The physician wanted to use Lexapro and asked if it safe to use in breastfeeding
 - Limited data- case reports/case series
 - Does cross into breastmilk in low levels
 - Probably compatible
 - Potential alternatives: sertraline, fluoxetine, paroxetine, or nortriptyline




57

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Summary

- Determine medication of concern
 - General pharmacokinetic parameters
- Degree of lactation
 - Potential impact on lactation
- Amount of medication ingested in mother and potential concern in infant
 - Maternal/Infant factors
 - Potential impact on infant



58

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Questions?



Green Sea Turtle in the Great Barrier Reef off Port Douglas, Australia



59
