

# CAN I TAKE THIS?

Breastfeeding and Medications

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PEDIATRICS AND BREASTFEEDING MEDICINE  
LAKESHORE MEDICAL CLINIC

NO, YOU CAN'T

# HORMONES INVOLVED IN BREASTFEEDING

POTENTIAL TARGETS FOR MEDICATION

# DURING PREGNANCY

- Human Placental Lactogen (HPL) and Progesterone prevent milk release.
- Progesterone sensitizes mammary cells to the effects of insulin
- Thyroid hormones increase sensitivity to prolactin

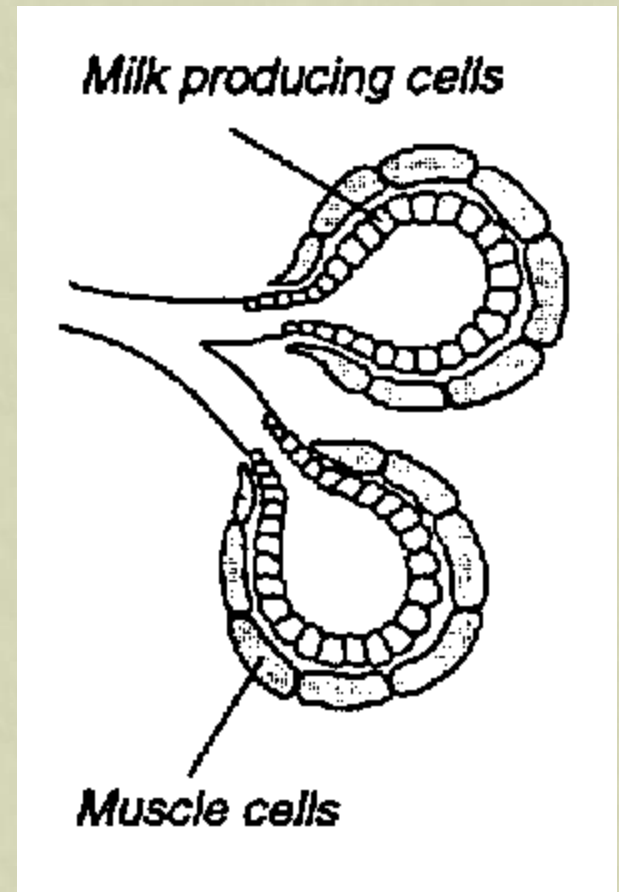
# HORMONES THAT MAY BE AFFECTED BY MEDICATIONS

- Three main hormones for lactation to begin: prolactin, insulin, hydrocortisone
- And progesterone must go away

# HORMONES THAT MAY BE AFFECTED BY MEDICATIONS

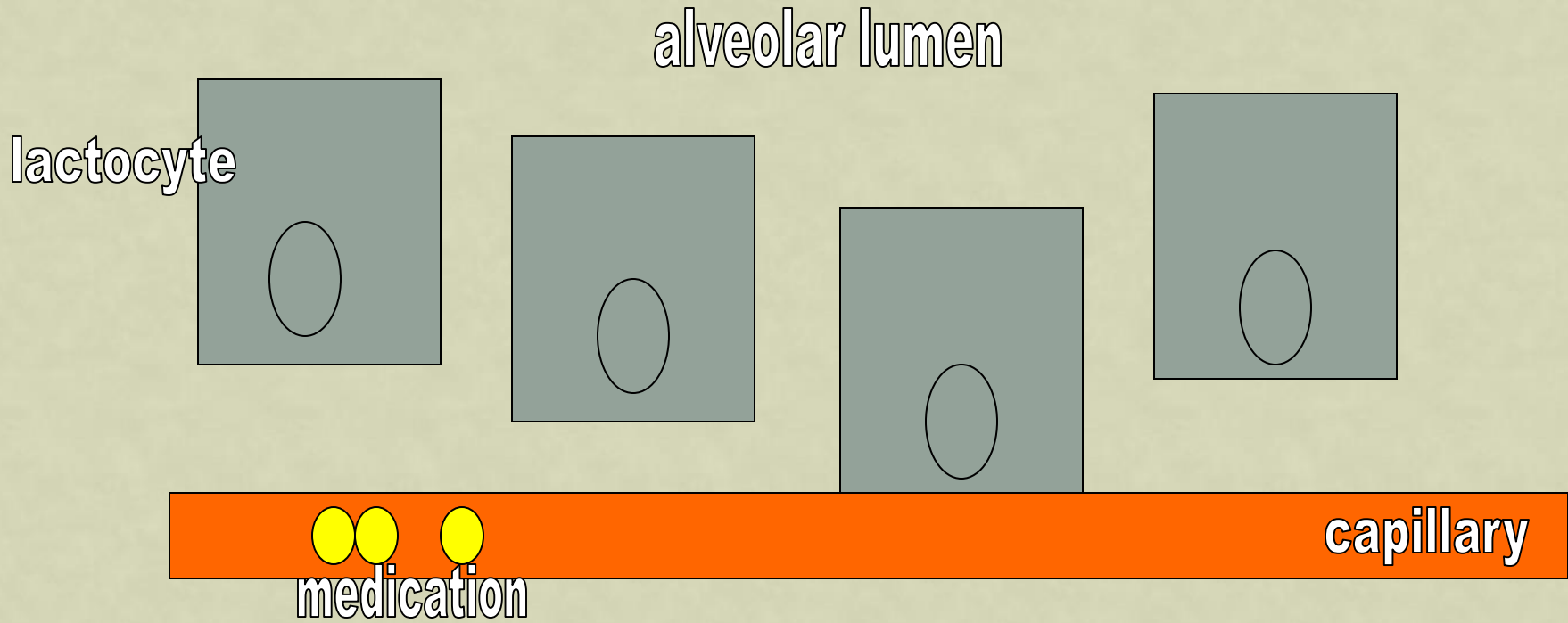
**Prolactin:** mediates CNS regulation of milk secretion.  
Influenced by rate of milk removal by infant

**Oxytocin:** neuroendocrine reflex that stimulates myoepithelial cells which then force milk into the ducts (MER)



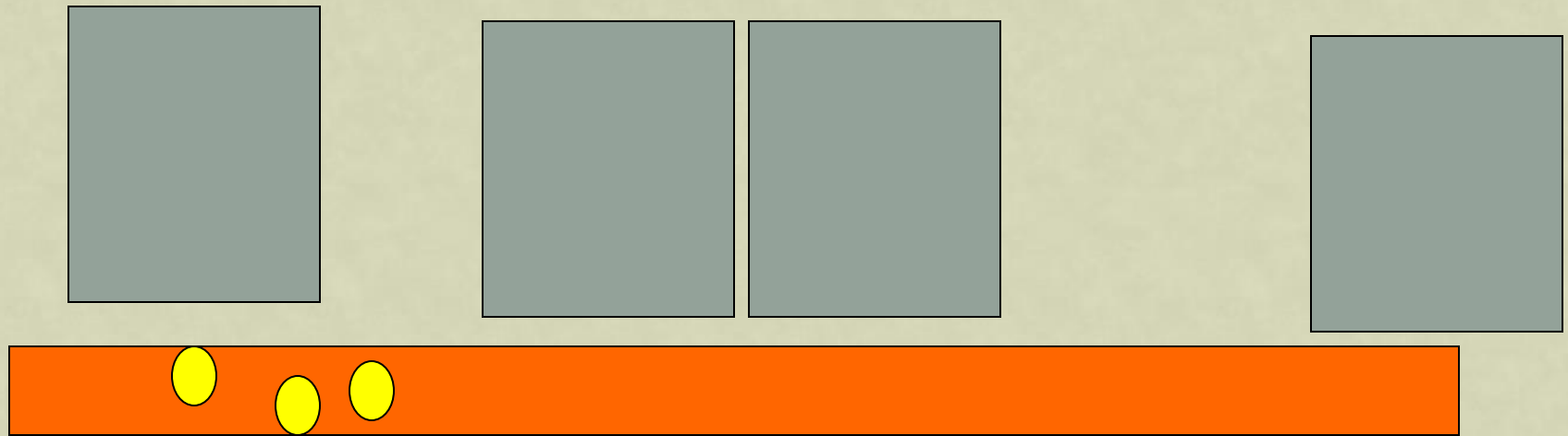
# TIMING OF MEDICATION DELIVERY

- Birth to about day 4: medications can pass easily into breastmilk because gap junctions between cells are permeable.
- When gap junctions close, then medications would need to penetrate 2 lipid bilayers to get into milk
- Similar to blood-brain barrier



Day of delivery until day of life 4





Day 4- closure of gap junctions  
Establishment of blood:milk barrier

# plasma

sodium 134-136

chloride 95-108

albumin 35-80 g/L



# milk

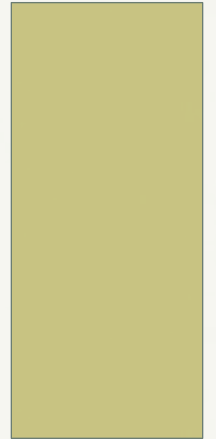
sodium 8-15

chloride 10-20

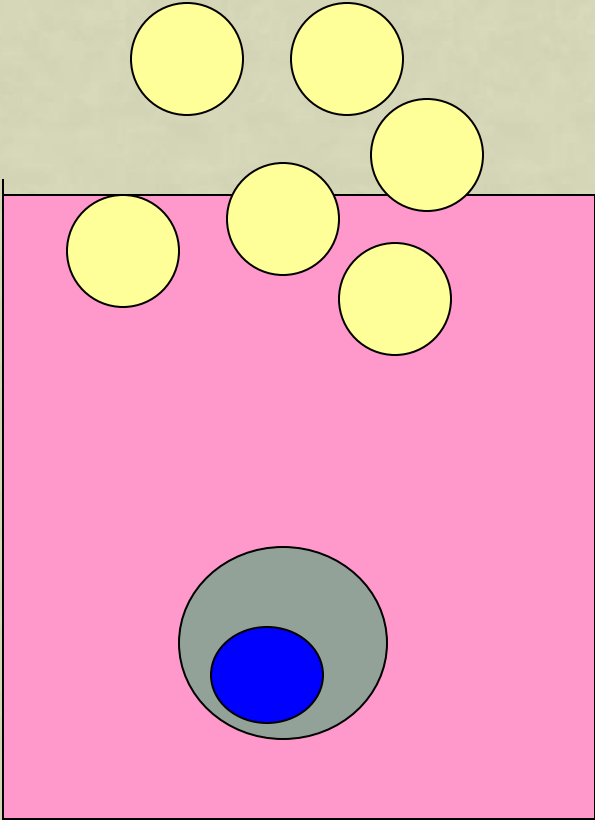
lactose 180

albumin 0.3 g/L

# HOW DOES MEDICATION GET INTO BREASTMILK....



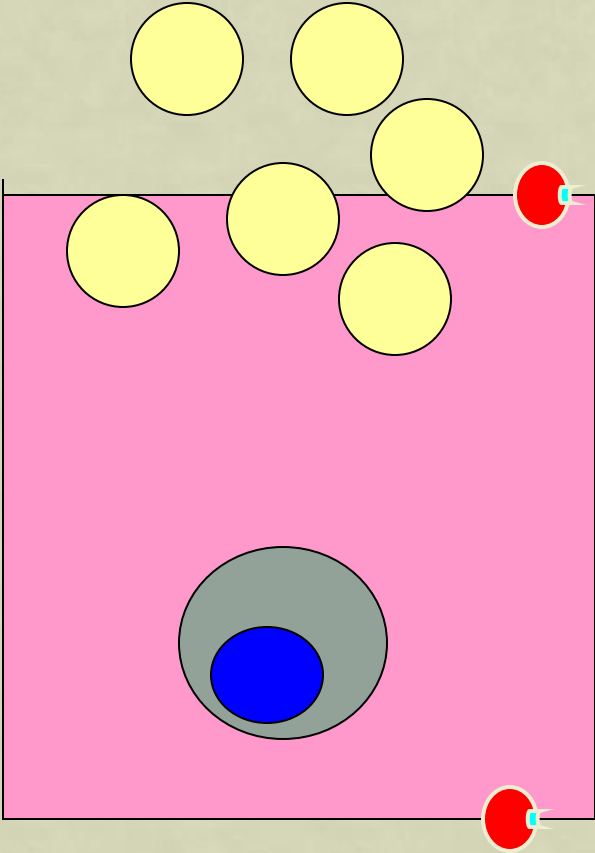
alveolar lumen



capillary

simple diffusion

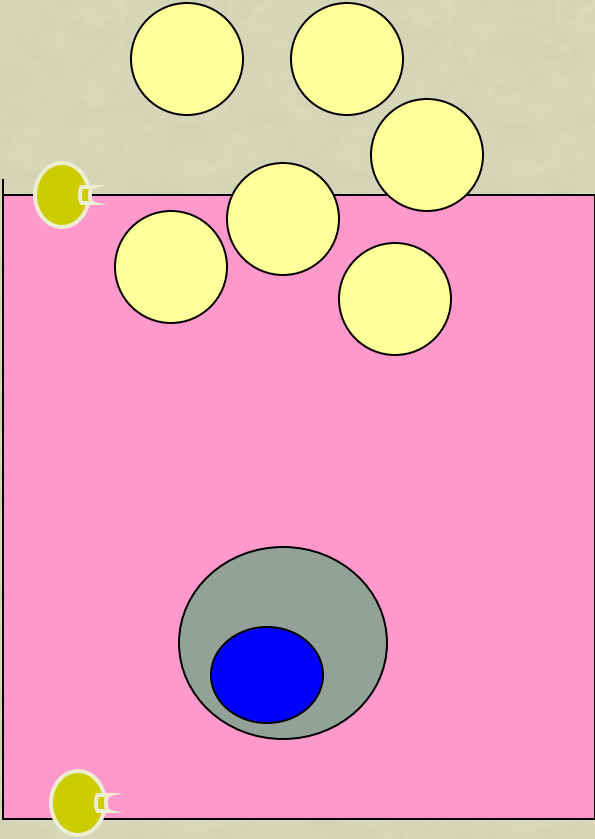
alveolar lumen



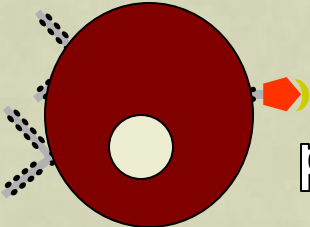
capillary

influx transporters

alveolar lumen



capillary



plasma cell

protein transporter

# RELATIVE INFANT DOSE

Infant dose (mg/kg/day)

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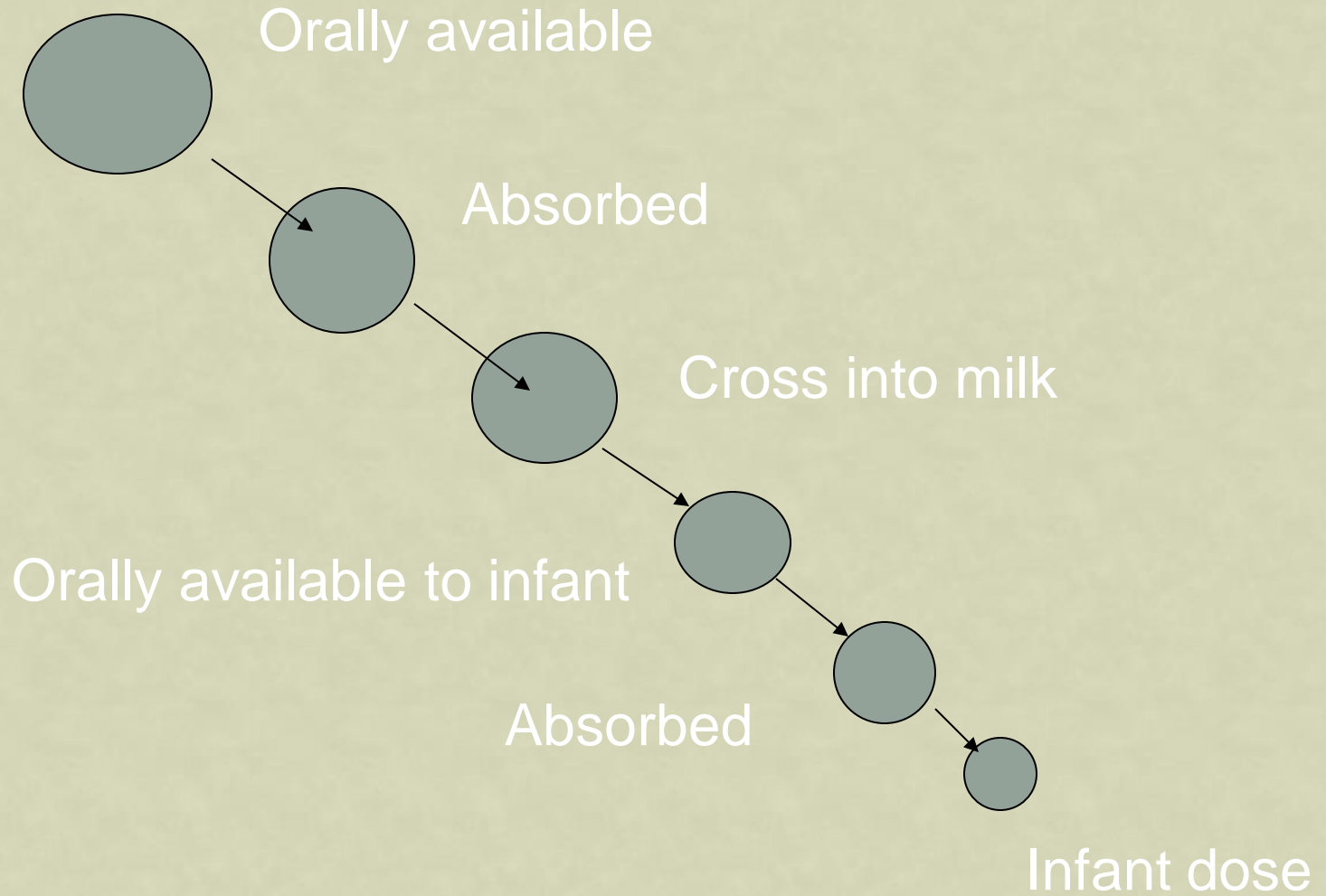
Maternal dose (mg/kg/day)

# FOR A DRUG TO MAKE A DIFFERENCE

- Needs to be orally available
- Absorbed through GI tract
- Transferred into milk
- Orally available to infant
- Absorbed by infant GI tract
- Present in a clinically significant amount



Mom uses medication



# ORAL ABSORPTION

- Poor oral absorption
  - Large molecular weight (800-1000 Daltons)
  - Examples: Heparin, Aminoglycosides, 3<sup>rd</sup> generation cephalosporins, radiocontrast agents

# BIOAVAILABILITY

- Poor with drugs sequestered in the liver
  - Morphine
  - Sumatriptan

# GI TRACT ABSORPTION

- Poorly absorbed
  - Gadolinium salts (MRI)
  - Iodinated contrast agents (CT)
  - Vancomycin
  - 3<sup>rd</sup> generation cephalosporins

# LARGE MOLECULAR WEIGHT

- Insulin
- hGH
- Interferon
  
- Probably unstable in gastric pH

# GENERAL GUIDELINES

- Use topical therapy when possible
- Medications that we use for a newborn baby are generally safe to use in a nursing mom
- Pregnancy risk is not the same as breastfeeding risk

# GENERAL GUIDELINES

Choose meds with:

Short half-life

High protein binding

Large molecular weight

Low oral absorption

Low lipid solubility

# SPECIFIC CLINICAL SITUATIONS



# DEPRESSION

- Negative experiences (both the absence of good and the presence of bad) have long lasting effects
- Breastfeeding is protective against adverse outcomes from maternal depression
- Need to consider the consequence of untreated depression when counseling about medication

# DEPRESSION

The baby benefits more from breastmilk with some medication in it than being cared for by a mother who is depressed.

Mothers who need medication should get it.

# SSRI

- Zoloft ( sertraline) best studied, considered best choice
- Adverse effects of SSRIs mostly case reports
- Probably best not to change medication that is currently effective

# SSRI

- Prozac (fluoxetine) longest half life- reports of fussy babies, less weight gain
- Paxil (paroxetine) RID= 1.25%, neonatal withdrawal
- Celexa (citalopram) RID = 5.5%
- Lexapro (escitalopram) RID= 5.3%

# SSRI DISCONTINUATION SYNDROME

- Muscle tone regulation disorders: hypertonia, tremor, myoclonus, shivering
- Irritability, excessive crying
- Sweating
- Feeding problems
- In one study, 30% of neonates exposed in utero to SSRI developed discontinuation symptoms within 48 hours after birth.

# BUPROPRION

- RID= 2%
- Mechanism of action – dopamine agonist
- Compatible with breastfeeding in terms of few effects for baby, may be potentially bad for milk supply