

**Making More Milk**  
**Presented by Diana West, BA, IBCLC**

# Making More Milk

Presented by  
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## GET A HEAD START:

### MAXIMIZING MILK PRODUCTION CAPABILITY

## MAXIMIZE MILK PRODUCTION CAPABILITY

- ❖ Especially when there is a known risk factor
  - Hormonal problems
    - PCOS, thyroid, luteal phase defect, insulin resistance, Type I diabetes
  - Hx breast surgery, breast injury/trauma
  - High risk of infant hypoglycemia
    - Mother is Type I diabetic
  - Hx of prior milk production problems

## LUTEAL PHASE DEFECT

- ❖ Not enough progesterone in second half of menstrual cycle
- ❖ Common cause of miscarriage
- ❖ The higher the progesterone levels in pregnancy, the better the milk production is postpartum (*Ingram, 1999*)

## LUTEAL PHASE DEFECT

- ❖ Many informal reports of progesterone supplementation during pregnancy connected to better milk production
- ❖ Case report of woman with LPD (*Bodley, 1999*)
  - First successful pregnancy, no breast growth, very little milk
  - Second pregnancy, progesterone treatment, milk production normal
- ❖ Progesterone inhibits prolactin, so treat only during pregnancy

## POLYCYSTIC OVARIAN SYNDROME (PCOS)

- ❖ Multiple ovarian cysts (*Glueck, 2004*)
- ❖ Incidence: 4-12%
- ❖ Can cause high levels of testosterone, estrogen, and insulin
- ❖ Can cause low progesterone
- ❖ Can cause infertility
- ❖ Possible symptoms:
  - Hirsutism (excess body hair)
  - Alopecia (balding)
  - Obesity
  - Masculine characteristics
  - Insulin resistance
  - Hypoplasia (insufficient glandular tissue)
    - Risk factor for low supply

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## POLYCYSTIC OVARIAN SYNDROME (PCOS)

- ❖ Treatment with Metformin often increases milk production (*Gabbay, 2003*)
  - Both during pregnancy and after delivery
  - Safe for baby (*Hale, 2010*)

## THYROID DYSFUNCTION

- ❖ All three types can reduce milk production
  - Hyperthyroid
  - Hypothyroid
  - Postpartum thyroiditis
- ❖ Rat studies give new clues why (*Marasco, 2006; Hapon, 2003; Varas, 2002, Varas, 2005*)
  - Reduced milk ejection from oxytocin inhibition
  - Not inhibited milk synthesis

## THYROID DYSFUNCTION

- ❖ Commonly associated with anemia and pp hemorrhage
  - Both risk factors for low supply
- ❖ Need comprehensive (not screening) test (TSH + Total or Free T3 + Total or Free T4)
  - TSH range for fertility/pregnancy: .5-3.0 or even .5-2.5 (*Mandel, 2005*)
- ❖ Even borderline cases tend to improve with treatment
- ❖ Monitor closely during pregnancy
- ❖ If out of range, test frequently postpartum

## EXPRESS MILK BEFORE BABY IS BORN

- ❖ Old method rediscovered in Australia (*Chapman, 2012, Chapman, 2012, Cox, 2006; Cox 2010*)
  - Practice instituted for hypoglycemic infants of Type I diabetic mothers
- ❖ Gentle hand expression once or twice a day

## EXPRESS MILK BEFORE BABY IS BORN

- ❖ **Express Milk Before Baby is Born**
  - Begin from 34<sup>th</sup> week of pregnancy
  - Each day after taking hot shower when breasts are warm
  - Stop expressing if cramps or contractions
  - Use 1-3 mm or periodontal syringes to draw up expressed colostrum
  - Use same syringe for 48 hours, refrigerating in between
  - Freeze syringes in zip-close bag
  - Bring to hospital to use as supplementation
    - Defrost under warm running water

## EXPRESS MILK BEFORE BABY IS BORN

- ❖ Many authors recommended for antenatal breast care and improved breastfeeding (*Ingelman, 1958; Myles, 1964; Applebaum, 1969; Eiger and Olds, 1973; Messenger, 1983*)

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## EXPRESS MILK BEFORE BABY IS BORN

### ❖ Significant benefits

- Collected colostrum can be used as supplementation
- Additional colostrum ↑ energy for feeding
- Better feeding → better milk removal
- Better milk removal → more milk production
- May hasten Lactogenesis II

## EXPRESS MILK BEFORE BABY IS BORN

### ❖ Significant benefits

- Increases comfort in touching and handling her breasts (Llewellyn-Jones, 1983)
- Teaches hand expression!
- Validates mothers' need to prepare for breastfeeding

## EXPRESS MILK BEFORE BABY IS BORN

### ❖ Safety concerns

- Preterm labor???
- Prenatal nipple stimulation while expressing colostrum can **NOT** induce premature labor (Cox, 2010)

## EXPRESS MILK BEFORE BABY IS BORN

### ❖ Safety concerns

- Preterm labor???
- Many activities are precursors for oxytocin release:
  - Eating
    - Particularly foods with phenethylamines such as chocolate)
  - Laughing
  - Kissing
  - Hugging
  - Masturbation and sexual intercourse
    - **Oxytocin surges MUCH stronger with orgasm!**

## EXPRESS MILK BEFORE BABY IS BORN

### ❖ Safety concerns

- Preterm labor???
- *Oxytocin surges will only induce labor if there are sufficient oxytocin receptors in the middle layer of the uterine wall (myometrium)* (Blackburn, 2003)

## EXPRESS MILK BEFORE BABY IS BORN

### ❖ Safety concerns

- No evidence for causing preterm labor
- Cox (2006) reviewed a group of studies in which pregnant women experienced varying but long periods of nipple stimulation (Di Lieto et al, 1989; Stein et al, 1990; Curtis et al, 1999)
- None of the studies showed significant effects in inducing labor

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## EXPRESS MILK BEFORE BABY IS BORN

- ❖ Safety concerns???
- No evidence for causing preterm labor
  - 2009 study by Ishii
    - 110 women continued breastfeeding through pregnancy compared to 774 women who did not breastfeed during pregnancy
    - No statistically significant difference in labor initiation

## EXPRESS MILK BEFORE BABY IS BORN

- ❖ Safety concerns???
- No evidence for causing preterm labor
  - 2009 pilot study by Forster et al
    - 43 women hand expressed 2x/day from week 36
    - No evidence of fetal compromise
    - Despite this, authors recommend antenatal expression should cease until efficacy can be tested in randomized controlled trial (RCT)
      - An RCT would be unethical (some babies would not receive colostrum)

## EXPRESS MILK BEFORE BABY IS BORN

- ❖ 2009 pilot study by Forster et al
  - At 6 weeks pp, 95% were positive about their experience of prenatal milk expression
  - They would do it again

## EXPRESS MILK BEFORE BABY IS BORN

- ❖ Safety concerns
  - Tandem Nursing is Safe
    - Study of 57 women who had continued to breastfeed during pregnancy
    - Infants born to these mothers were healthy and appropriate for gestational age  
*(Moscone and Moore, 1993)*

## MAXIMIZE MILK REMOVAL IN THE FIRST TWO WEEKS

## MAXIMIZE MILK REMOVAL TO CALIBRATE HIGH LACTATION CAPABILITY

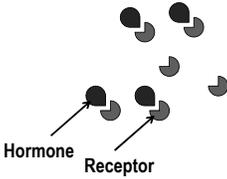
- Hormonal receptors seem to be established in the breast in first 2-3 weeks in response to milk removal
- The more milk that is removed, the higher milk production capability will be for this baby
  - Calibration process restarts for each baby
- Extra milk removal *even if only just during this time* helps create the highest possible “set point”

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## HORMONES AND RECEPTORS

- ❖ Hormones need receptors to act on a target organ
- ❖ Each hormone has its own receptor
- ❖ There are receptors in each organ of our body
- ❖ The more receptors, the more effective hormones are



➤ Not enough receptors → hormones less effective

## FACILITATE BREASTFEEDING

- ❖ Delay bathing of mothers and babies as long as possible
  - Babies placed on their mothers' chests immediately after birth with their hands free smear amniotic fluid onto the breasts as they use their hands and face to find them (Varendi, 1996; Varendi, 1997)
  - Smell of amniotic fluid orients to breasts like tracking beacon
  - Critical biological sequence
    - Helps babies cue into their natural latching instincts
  - Obviously less effective for water births
    - BUT water birth babies tend to orient more easily to breast

## SKIN TO SKIN

- ❖ Enhances metabolism of brown adipose tissue
  - increase gluconeogenesis and ketogenesis
  - decreases risk of hypoglycemia requiring supplementation (Christensson et al 1992)
- ❖ Promotes physiologic stability for better feeding (Bauer, 1997; Bier, 1996; Bohnhorst, 2001; Cattaneo, 1998; Gaxxolo, 2000; Tornhage, 1998; Whitelaw, 1994) ← TIP OF CITATION ICEBURG
  - Regulates baby's body temperature (thermoregulation)
    - Increases blood oxygenation
  - Stabilizes pulmonary function
- ❖ Increases maternal milk supply, breastfeeding duration (Bier, 1996)

## BABY-LED LATCHING

- ❖ A reclined position allow baby to use breastfeeding reflexes to latch himself (Colson, 2008)
  - "Biological Nursing" (Suzanne Colson)
  - Also known as "Laid Back Breastfeeding"
- ❖ Mom leaning back so gravity helps
  - NOT fully flat
- ❖ Gravity holds baby firmly against mom in VENTRAL position
  - Increases baby's sense of stability & security

## BABY-LED LATCHING

- ❖ Releases baby's AND mother's natural reflexes and instincts
- ❖ Baby impresses mother with his competency
- ❖ Helps improve milk transfer and painless latching
- ❖ Does not require any hands-on help from lactation helper
- ❖ Mother feels more confident



## BABY-LED LATCHING

- ❖ Snuggle baby high up between mom's breasts
- ❖ Mother automatically strokes baby's back
- ❖ Baby begins woodpecker motion and bobbing down to a breast to self-attach
- ❖ Mother only needs to support, not to guide
- ❖ More info: Baby-Led Breastfeeding video [biologicalnurturing.com](http://biologicalnurturing.com)

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## HAND EXPRESS COLOSTRUM

(IN ADDITION TO NURSING)

- ❖ Hand expression more effective to remove colostrum in first 48 hours  
*(Ohyama, 2010)*  
Moves thick colostrum more easily through breast
  - Pumps pull fluid into the areola
    - Compounds LGII areolar edema
    - Makes it harder to baby to latch
  - Learning how to hand express is a “handy” skill

## HAND EXPRESS COLOSTRUM

(IN ADDITION TO NURSING)

- ❖ 2009 study by Dr. Jane Morton and Colleagues at Stanford
  - Expressing colostrum at least 6x/day in first 3 days pp increases later milk production by avg 45% (Morton, 2009)
- ❖ Manage expectations by expressing into a spoon or shotglass (more stable on table)

## CATCHING UP: MAKING MORE MILK

## TARGETING THE TREATMENT TO THE CAUSE

- ❖ **Treating the actual underlying problem increases the chance of improving lactation**
- ❖ ***Take the time to gather a thorough history and assess the mother and baby to determine the likely cause***

## CONSIDER THE GOAL

- ❖ **Increasing Prolactin**
  - Milk production
- ❖ **Increasing oxytocin**
  - Milk ejection

## INCREASING PROLACTIN (MILK PRODUCTION)

- ❖ ***Increasing milk removal***

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### INCREASE BREASTFEEDING FREQUENCY

- ❖ Number one cause of low milk production
- ❖ Easiest to reverse

### INCREASE BREASTFEEDING FREQUENCY

- ❖ Suggest a "babymoon" (vacation with baby)
  - Spend 2-3 days together
  - NO one else cares for the baby

### PUMPING TO REMOVE MORE MILK

#### ❖ Pro

- Can be helpful in increasing milk production, especially if baby is not nursing well or does not nurse for comfort

#### ❖ Con

- Can quickly exhaust and overwhelm a new mother, especially one with older children
- Introduces a mechanical, unnatural aspect

### PUMPING TO REMOVE MORE MILK

- ❖ No one right way to go about it
- ❖ Encourage flexibility
- ❖ Determine what she can do
  - Rather than feeling guilty for what she can't or won't
- ❖ Not necessary to be evenly spaced
- ❖ Hospital grade usually best after milk comes in
  - Manual pump next best

### PUMPING TO REMOVE MORE MILK

#### ❖ Length of pumping session

- Amount of time varies by woman and pumping session
- Avoid watching the clock
- She'll learn when her breasts feel drained
- Pump for 2-5 minutes after the milk stops flowing rapidly and the breast seems drained

#### ❖ Feed baby any expressed milk

### PUMP FLANGES

#### ❖ Ensure the pump flange fits

- Most women need a larger size than the standard 24 mm (*Prime, 2010*)
- Some brands now providing two sizes in kits
- Nipple should move freely w/o rubbing sides of tunnel
- Should be noticeable movement of areola

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## PUMPING OPTIONS

### ❖ Pump during night

- Takes advantage of any higher prolactin levels
- Since sleep deprivation can reduce prolactin, important to balance
- At least once per night, if possible
- Don't set an alarm, but if she happens to wake, use that opportunity
- Sedating effects of oxytocin help return to sleep

## PUMPING OPTIONS

### ❖ Power-Pump (for 2-3 days)

- Useful when mother having hard time getting in enough pumping sessions
- 5 minutes many times a day (10-20)

## PUMPING OPTIONS

### ❖ How to Power-Pump

- Place pump in convenient location in home
- Every time she passes it, use for 5-10 minutes
- Pump as often as every 45 minutes
  - Pumping more often may not be helpful
- No need to refrigerate milk or wash kit in between

## PUMPING OPTIONS

### ❖ How to Power-Pump

- Continue pumping into same bottle and kit for 4-6 hrs, depending room temperature
- After 4-6 hrs, take accumulated milk to refrigerator, wash kit, start fresh for the next 4-6 hour period
- If mom uncomfortable not washing, just put whole kit with pumped milk in refrigerator

## PUMPING OPTIONS

### ❖ How to Power-Pump

- If there are pets or toddlers in the house, consider placing pump parts on high level
- The pump and all parts can be put in a plastic container for further protection

## PUMPING OPTIONS

### ❖ Pump while nursing

- (+) Double stimulating!
- (+) Takes advantage of baby's superior milk ejection stimulation
- (-) Can be over-stimulating for some women
- (-) Can be awkward and difficult
- *Easier with practice*

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## BREAST COMPRESSIONS

- ❖ Easy and very effective
- ❖ Enhances milk removal by adding pressure inside breast to propel milk through ducts for easier removal by baby or pump

## BREAST COMPRESSIONS

- ❖ Hold breast with thumb on top and fingers underneath (or vice versa)
  - Far back on breast away from areola
- ❖ Compress tissue between fingers and thumb gently but firmly
- ❖ Hold the compression until milk ejection slows (or baby's swallows slow)
- ❖ Should not hurt or pinch ducts

## MAXIMIZE MILK REMOVAL WITH "HANDS ON PUMPING"

## HAND EXPRESS AFTER PUMPING

- ❖ There is usually more milk that can be expressed
- ❖ More milk removed = more milk that will be made

## BREAST COMPRESSIONS + PUMPING + HAND EXPRESSION

- ❖ Study by Dr. Jane Morton and colleagues at Stanford

Morton J, Hall JY,  
Wong RJ, Thairu L,  
Benitz WE, Rhine  
WD. Combining  
hand techniques  
with electric  
pumping increases  
milk production in  
mothers of preterm  
infants...J Perinatol.  
2009 Jul 2.

## GALACTAGOGUES

- ❖ Chemical substances that have the ability to increase milk production
- ❖ First line or last line treatment, depending on cause of low milk production
- ❖ Effectiveness and safety vary
- ❖ Danger of unintended side effects and negative interactions with other medications

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## GALACTAGOGUES

- ❖ Prescription Galactagogues
- ❖ Herbal Galactagogues
- ❖ Nutritional Galactagogues

## METFORMIN (*GLUCOPHAGE*)

- ❖ Common treatment for PCOS and Type II diabetes
- ❖ Improves blood sugar by improving receptor sensitivity
  - Reverses insulin insufficiency by sensitizing the cells to insulin, thus lowering circulating insulin levels, reducing androgen levels, and facilitating ovulation (*Glueck, 2002*)

## METFORMIN (*GLUCOPHAGE*)

- ❖ In PCOS and Type II diabetic women, metformin treatment has resulted in increased milk production (*Gabbay, 2003*)
- ❖ Commonly causes significant GI problems in first 2-3 weeks, sometimes indefinitely
  - Taking after meals and SR version may help

## NUTRITIONAL GALACTAGOGUES

- ❖ Many galactagogues are foods
- ❖ Most cultures have traditional foods that they believe help milk production
- ❖ Foods can have medicinal properties

## NUTRITIONAL GALACTAGOGUES

- ❖ **Oatmeal**
  - Galactogenic mechanism not understood
  - Comfort food
  - Contains proteins, vitamins, minerals, and roughage
  - Steel cut, old fashioned best
  - Can be prepared in any way mother prefers, including cookies

## NUTRITIONAL GALACTAGOGUES

- ❖ **Malunggay (*moringa oleifera*)**
  - Widely cultivated in Africa, Central & South America, Sri Lanka, India, Mexico, Malaysia, Indonesia, Philippines
  - Almost every part of tree can be used for food or has beneficial property (*270 studies*)



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## NUTRITIONAL GALACTAGOGUES

### ❖ Whole grains

- Cereals that contain bran, germ, and endosperm
- Common whole grains
  - Wheat
  - Oat
  - Maize
  - Brown rice
  - Rye
  - Triticale
  - Teff

## NUTRITIONAL GALACTAGOGUES

- Roughage
  - Dairy industry manipulates cows' dietary roughage to increase milk volume, cream ratio
  - Fiber drinks?
- Maintain Carbohydrates
  - Low carb diets have been observed to significantly decrease milk production

## NUTRITIONAL GALACTAGOGUES

### ❖ Beer?

- Barley and hops (concentrated in dark beer) may increase production **BUT**
  - Alcohol temporarily inhibits milk ejection reflex and milk production, especially in large amounts
  - Chronic alcohol use lowers milk supply permanently

## NUTRITIONAL GALACTAGOGUES

### ❖ Calcium and Magnesium Supplements

- Many mothers have found helpful for supply dips during menstruation
  - 1500 mg calcium + 750 mg magnesium per day
  - Start at ovulation, continue taking through menstruation

## HERBAL GALACTAGOGUES

❖ *Many more options than fenugreek and blessed thistle!*

### ❖ General points

- Have been used by nursing women in almost every culture
- Medicinal herbs can be potent medicines
- Not harmless just because they are "natural"
- Evidence for herbal galactagogues largely anecdotal, *but still valid*

## HERBAL GALACTOGOGUES FOR INCREASING MILK PRODUCTION

- ❖ Alfalfa
- ❖ Fennel
- ❖ Fenugreek
- ❖ Goat's Rue
- ❖ Nettle
- ❖ Shatavari

*Only a starting point.....*

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### INCREASING OXYTOCIN (MILK EJECTION)

- ❖ *Nerve stimulation*
- ❖ *Reducing inhibitors*

### HERBAL GALACTOGOGUES FOR INCREASING MILK EJECTION

- ❖ Anise
- ❖ Black cohosh
- ❖ Caraway
- ❖ Chasteberry (vitex)
- ❖ Coriander
- ❖ Dill
- ❖ Fennel
- ❖ Red raspberry
- ❖ Wild lettuce

### WARMTH

- ❖ Warm, moist compresses applied to breasts just prior to nursing or pumping
  - Amount of milk obtained from warmed breasts significantly higher (Yigit, 2012)

### WARMTH

- ❖ Commercial products
- ❖ Rice-filled sock
  - ❖ Lightly dampen and microwave ~30 sec (warm, not hot)
- ❖ Warm, wet washcloth
- ❖ Hot showers
- ❖ Nursing baby in bath

### BREAST MASSAGE BETWEEN AND BEFORE FEEDINGS

- ❖ Breast massage for general stimulation and enhancement practiced in several cultures
- ❖ Brings milk forward for easy removal
- ❖ Helps stimulate milk ejection
- ❖ One study found 40-50% more milk removed when pumping with massage than without it (Jones, 2001)

### NIPPLE STIMULATION

- ❖ Any form of nipple stimulation can encourage milk ejection
  - Gentle tickling
  - Rolling
  - "Twiddling"
  - Pulling

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## REVERSE PRESSURE SOFTENING

- ❖ Often causes a milk ejection (*Cotterman, 2004*)

## RELAXATION

- ❖ **CHILDBIRTH  
RELAXATION  
TECHNIQUES**

## RELAXATION

- ❖ **PSYCHOLOGICAL RELAXATION**
  - ❖ Envision anything that gives a feeling of peace and well-being
    - Lying in the sun or sitting beside a mountain lake

## RELAXATION

- ❖ **PHYSICAL RELAXATION**
  - Concentrate on progressively relaxing muscles from toes to scalp, while breathing deeply

## RELAXATION

- ❖ **AUDITORY NARRATIVES PROVIDE  
GUIDED RELAXATION**
  - Shown to increase milk production (*Feher, 1989*)
    - **Hypnosis for Making More Milk**  
by Robin Frees, BA, IBCLC ([newbornconcepts.com](http://newbornconcepts.com))
    - **Letting Down**  
by James Wierzbicki and Betsy Feldman (Willow Music)
    - **A Bond Like No Other** by Anji, Inc. ([anjionline.com](http://anjionline.com))
    - **Breastfeeding Meditation**  
by Sheri Menelli ([menelli.com/whp/products.htm](http://menelli.com/whp/products.htm))
    - **Pumping Secrets**  
by Jennifer Milone ([pumpingsecrets.com](http://pumpingsecrets.com))

## CHIROPRACTICS

- ❖ May help when spinal vertebrae misaligned and compressing or irritating spinal nerves (*subluxation*) (*Vallone, 2007*)
- ❖ Helps restore nerve communication in key areas

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## ACUPUNCTURE AND ACUPRESSURE

- ❖ Used to treat low milk production for over two thousand years
- ❖ Many research studies show effectiveness

*(Kvist, 2007; Jenner, 2002; Nedkova, 1995; Clavey, 1996; Sheng, 1989)*

## SPINE WALK

- ❖ Knuckles on either side of spine, from neck to waist
  - May cause shiver or chill sensation that triggers milk ejection

## SHOULDER MESSAGES

- ❖ Massage shoulder close to neck while nursing / pumping
- ❖ Stimulates a milk ejection acupressure point
  - Gallbladder 21
  - Halfway between shoulder and neck, at high point of muscle

## WHEN ALL ELSE FAILS: TAKE A NAP!

- ❖ When she's at the end of her rope... a nap can do wonders!
  - *Someone else feeds baby pumped milk for as long as mom can sleep*
  - *Her perspective likely to dramatically improve*
- ❖ **MORE MILK:** Sleep increases prolactin

## FUTURE POSSIBILITIES

- ❖ Prolactin dermal patch?
  - Study at Massachusetts General Hospital synthesized recombinant prolactin (r-hPRL) and increased milk production significantly *(Powe, 2010; Powe, 2011)*
- ❖ Breast cancer research on turning cell growth off and on via stem cells *(Asselin-Labat, 2008; Vaillant, 2007; Shackleton, 2006)*
  - Has already led to new breast tissue growth in mice from single stem cell
  - Possibilities for replacing tissue damaged from breast surgery or incomplete development (hypoplasia)

## KEY POINTS ABOUT INCREASING MILK PRODUCTION

- ❖ Maximize milk production capability in moms with vulnerable supplies
- ❖ Maximize milk removal in first 2-3 weeks to calibrate milk supply as high as possible
- ❖ Focus on methods that remove more milk
- ❖ Target increasing milk strategy to techniques or galactagogues that increase prolactin or oxytocin
- ❖ **Encourage the mom to connect with other moms**
  - La Leche League ([lille.org](http://lille.org))
  - MOBI ([mobimotherhood.com](http://mobimotherhood.com))

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# THE END!



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Questions?  
Thoughts?  
Comments?

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