Make it Easy

Beyond pumps and galactogogues

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Objectives

1. Describe how a mother can misunderstand how milk is produced, and how her worries about her milk production can actually interfere with her milk production.
2. Name 3 ways to facilitate optimum milk production in the first days postpartum, and 2 common practices that interfere with easy milk production.
3. List three easy strategies for speeding the rate of milk production. Describe why some common instructions for pumping might be counterproductive.

Paradigms

How we frame a problem
determines how we will solve it.
Or…
Ask the wrong question:
Get the wrong answer

WARNING

Most of what I say here is

- NOT high level evidence-based medicine
  - That is, NOT based on RCT or meta-analysis
- Based on clinical observation
  - Empirical experiential learning from our breastfeeding medicine practice
- Tempered by
  - The literature
  - How physiology helps us understand problems we see

Take what I say with a grain of salt

- Test the worthiness of what you hear against
  - Your own experience
  - Your observations
  - Your own reading and research
- I am not the final expert on anythir

Consider…

What do we mean by
"milk supply" anyway?

Do we *control* any of these?

How do we increase our tears?
- Our saliva?
- Our sweat?
- Our gastric acid?

Do you know anyone with problems producing enough of any of these?

Physiology 101

1. Redundancy
2. Homeostasis
3. The conscious brain is not in charge

Physiology 101

1. Redundancy

Human organs have excess capacity
Ability to make more than we need

Examples:

- Lungs, liver, spleen, muscle
- Blood, sweat, tears
- Mothers of multiples, wet nurses

Physiology 101

2. Homeostasis

The ***inherent ability*** or tendency of an organism or biological system to ***self-regulate*** its physiological processes
- In order to maintain:
  - Internal equilibrium
  - Physiological stability
- Despite variations in external conditions

Involves:
- Monitoring functions,
- Feedback functions,
- The capacity to adapt physiologic processes.

Physiology 101

3. The conscious brain is not in charge

The body makes our tissues and fluids…
- *Thoughtlessly*
- Continuously
- At varying rates
  - On a circadian rhythm
  - By using them (thoughtlessly)
    - The more we use, the more we make
    - The less we use, the less we make
    - No one-way streets

Now consider…

"Helping a mother increase her milk supply"

Paradigm:

Mother needs help.

Consults expert.

Expert helps mother.

Is there a difference between
"helping" and "empowering"?
or
How can we "help"
in a way that is empowering?

Ways of looking at this issue

I. Mothers' views
II. Medical and clinical views
   A. Differential diagnosis—List of possibilities
   B. Physiological basis—What's really going on

Who comes to us concerned about "low milk supply"?

The mother
- whose baby isn't gaining well
- who is using supplement
- who is expressing or pumping milk
- who's noticed a change in her baby's feeding style—may have been just fine at first
- who is tired, worried, uncertain, self-doubting

The dyad
- with a medical problem impacting breastfeeding
- who got a slow start with breastfeeding

Mothers with "low milk supply"

Each of these situations has its own issues:

- Babies who aren't gaining well
- Supplementing
- Pumping/expressing milk
- Medical problem
- Slow start with breastfeeding
- Breastfeeding was fine at first, now changed
- Worry, fatigue, insecurity

Various way mothers understand what's going on

- Mother is responsible for making milk
- Milk is made by stimulating the breast
- A mother has a measurable daily milk supply
- There is an upper limit to each mother's milk supply
- What she can measure demonstrates her breasts' capacity
- She must work hard to solve this problem
- She must nurse through pain
- It's her fault that she can't get enough milk
- She's having trouble, so she is failing her baby

Classically cited **medical causes** for compromised milk production

<u>Maternal causes</u>
- Thyroid issues
- Insufficient glandular tissue
- Sheehan's syndrome
- History of breast surgery
- Retained placental fragment
- Maternal illness
- Medications, smoking

<u>Infant causes</u>
- Ankyloglossia
- Jaundice
- Thyroid issues
- Infant illness, infection
- Neurologic disorders
- Other congenital problems
- Premature, SGA

***Common* causes**
for compromised milk production

Maternal causes
- Separation from infant
- Clock scheduling, "rules"
- Misunderstandings about feeding, about cues, etc.
- Struggling with sore nipples
- Delayed milk release—
  Due to confidence issues
  - Worry, anxiety, distrust
  - Painful feeding
  - Fatigue, lack of confidence, postpartum depression

Infant causes
- Separation from mother
- Clock scheduling, "rules"
- Delayed learning to feed
- "Shoved" to breast,
- Feeding issues not fixed: Tight grasp, tight jaw, etc.
- Vicious cycles:
  - Sleepy baby
  - Jaundice→ infrequent feeds
  - Slow weight gain
- Prematurity, SGA
- Tongue-tie

Breastfeeding 101

Back to basics

Pathophysiology

First must understand *physiology*
- Lactation: a *two-person* organ system
- Homeostasis involves their interaction
- Biobehavioral communication & feedback
  - Between two organisms: mom & baby
- For neurohumoral control of the system:
  - Infant autocrine control of maternal production

From Physiology 101

Understanding "homeostasis"

The ***inherent ability*** or tendency
of an organism or biological system
to ***self-regulate*** its physiological processes, to maintain
- Internal equilibrium
- Physiological stability

Despite variations in external conditions, involving
- Monitoring functions,
- Feedback functions,
- The capacity to adapt physiologic processes.

Breastfeeding 101

"Autocrine" control of lactation

Autocrine control
= *hormonal control by the nursing dyad*
- Maternal–infant neurobehavioral interaction
- The biologic basis of "supply and demand"
- No longer under mother's endocrine control
- Maternal mechanisms, without baby, are all geared to *shut down* lactation

Mothers don't make milk.

Babies make milk

Breastfeeding 101

"Autocrine control"
How the baby controls milk production

Suckling at the breast **(+)**

Mother's senses **(+)**

Receptors—places on the cell that receive these hormones **(+)**

Negative feedback—*the milk itself in each alveolus* ***(-)***

Breastfeeding 101

"Autocrine control"
How the baby controls milk production

Suckling at the breast
- Prolactin increases production **(+)**
- Oxytocin releases milk to baby **(+)**

Mother's senses

(smell, sound, touch, etc, just thinking about baby)
- Oxytocin releases milk to baby **(+)**

Breastfeeding 101

"Autocrine control"
How the baby controls milk production

Receptors—places on the cell that receive these hormones

- There are more prolactin receptors in multips **(+)**
- Oxytocin receptors increase with lots of suckling in first weeks **(+)**

Negative feedback—the milk itself in each alveolus

- Alveolar baroreceptors (milk pressure) **(-)**
- Leaving alveoli fuller ↓ milk production **(-)**
- Keeping alveoli emptier ↑ milk production **(+)**
- *Since oxytocin causes the alveoli to "empty," then* ***oxytocin release indirectly increases production*** **(+)**

Breastfeeding 101

How the baby controls milk production

Mother's senses—neurosensory stimulation

Skin to skin: feel of baby, scent, sight, sound of baby
Just thinking about baby
Feelings of love, laughter, joy

All cause maternal oxytocin release (+)
Releasing milk to baby and emptying alveoli
More emptying, more production

What interferes? (–)
Left-brained activity (like watching the clock)
Stress, pain, worry. Logic, concentration, goals.

SO, Indirectly, oxytocin increases production (+)

Milk is a side effect of love

Breastfeeding 101

Biobehavioral basis of milk production

Infant appetite cues

- Drop in blood sugar initiates
  - Flexion, muscle tension
  - Hand to mouth
  - Rooting reflex, head bobbing

Infant satiety cues

- Rise in lipid in meal, via CCK, causes:
  - Floppy, relaxed muscle tone
  - "Milk drunk"

Both photos from:
B. Wilson-Clay & K. Hoover, *The Breastfeeding Atlas*

BF 101: Physiology of a feeding:
Autocrine control

Requires mother-baby communication

Frequent suckling establishes production

- Establishes breast receptors for oxytocin and prolactin
- Makes milk production and release easier
- Feeding by biobehavioral cue helps infant titrate breasts' rate of production to baby's appetite *(principles of homeostasis)*
- Over time, increased rate of alveolar milk production allows infant to obtain larger volumes

Frequent feeding early on leads to larger volumes later on

Physiology 101

The conscious brain is not in charge

The body makes our tissues and fluids…

Thoughtlessly
Continuously
At varying rates
On a circadian rhythm
By using them (thoughtlessly)
The more we use, the more we make
The less we use, the less we make

Misunderstood paradigms

Mothers' Views:	***Contradicted by physiology***
1. Mother responsible for milk	1. Autocrine control
2. Time stimulating is key	2. Love—alveolar emptying
3. Measurable daily milk supply	3. A varying rhythm/rate
4. Upper limit to milk supply	4. Redundancy
5. Limited breasts' capacity	5. Redundancy
6. Work hard to solve problem	6. Confidence, love, trust
7. She must nurse through pain	7. Homeostasis--pain interferes
8. Supply issues are her fault	8. Paradigm, cultural issues
9. She's having trouble, so she is failing her baby	9. Paradigm is causing her troubles, confidence issues create vicious cycle

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Pathophysiology of low milk production

Common scenarios that may interfere with normal autocrine control

- Sleep, self-confidence and mood issues
- Separation of baby from mother and/or clock feeding
- Artificial feeding with or without pumping
- Ineffective grasp
- Painful feedings
- Vicious cycle of infant slow weight gain

Sleep, self-confidence, and mood issues

Variety of issues, separate but inter-related:

- Fatigue, sleep deprivation
- Lack of support—social, cultural, family
- Lack of confidence, self-efficacy
- Worry, stress, anxiety
- Postpartum mood issues

- Interfere with reading infant cues
- Interfere with maternal–infant relationship
- Can delay oxytocin release
- Vicious cycle exacerbates mood issues

Interference with autocrine control: Separations, clock feeding and rules

Separation interferes with dyad function & feedback

- ↓ receptors for oxytocin & prolactin
- ↓ biobehavioral feedback, learning

Clock scheduled feeds: meals don't coincide with appetite

- Offered breast when not hungry
  - Interferes with adequate intake
  - Poor intake → decreased production
- And/or not fed when hungry
  - Baby ↑ cortisol, ↓glucose
  - Mother ↓ milk release ↓ production

Clock feeding: Interferes with autocrine control

Mother doesn't learn early feeding cues

Mom thinks baby …

- "Just fussy" or has "colic"
- "Just wants attention"
- "Needs" to be put on a schedule

Or, mom thinks she doesn't have enough milk

→ gives formula early

→ decreases her milk production

Artificial feeding and pumping

- Interferes with autocrine control of milk production
- Appetite met without infant milk removal
- Bottle feeding used to measure pumping needs
  - Effect on oxytocin release
  - Effect pm confidence
- Repeated alveolar emptying of an "empty" breast necessary to increase production

Shallow, ineffective grasp of breast

Interferes with:

1. Effective suckling & milk transfer
   - Poor intake → decreased production
2. Feedback that keeps baby suckling
   - Keeping nipple stiff
   - Milk flow rate
3. Maternal comfort

Painful feedings

Often indicate tight grasp
→obstructing milk flow
Pain makes mom want to delay feeds
→fewer feeds per day
→less intake
→slows rate of production
Pain ↓ oxytocin release
→delayed milk release
→slows rate of production

Change the paradigm

- Mothers don't make milk; babies do
- Milk is a side effect of love, and laughter!
- There's no such thing as a supply of milk: only a varying rhythm of milk production
- The conscious brain is not in charge
- Sleep is good
- Pain is bad
- Any breast that can make milk can make more milk.

Mothers don't make milk—Babies do!
Milk is a side effect of love, and laughter!

- Empowering the mother: sleep, self-confidence and mood issues
- Why babies and mothers can't be separated and what to do when they have to be anyway
- Why a comfortable grasp is important
- Pumping and hand expression—smarter, not harder
- Decreasing supplement to increase milk production
- Stop the vicious cycle of infant slow weight gain

Empowering the mother
Empowering the baby

Break the vicious cycles

1. Feed the baby
2. Empower mother
3. Increase rate of milk production
4. Address primary problem
   - If still present (ankyloglossia, etc.)
   - Stop vicious cycles of SWG, lost confidence, etc
   - *If baby is underweight, issues with "latch", etc., might need to wait until infant's weight has "caught up," and baby is ready for new learning*

Empower the mother
to increase the rate of milk production

"Any breast that can make milk, can make more milk"
—CM Smillie

Confidence boosting measures

Oozing confidence (autonomic self-control)
- Your words
- Your expectations
- Your attitude

Cultural competence: accepting mother where she is

Empower the mother
to increase the rate of milk production

"Any breast that can make milk, can make more milk"
—CM Smillie

Fatigue, mood, attitude
- Sleep is good
- Pain is bad
- Support , positive feedback is good

PPD
- Watch for it, screen, refer
- Omega 3s

Increase rate of milk production

"Any breast that can make milk can make more milk"

1. Alveolar emptying—key to increasing production
2. Facilitate maternal confidence
3. Get good qualified lactation support (IBCLC)
   - Increase milk production
   - Breastfeeding, issues

Alveolar emptying— key to increasing production

"Any breast that can make milk, can make more milk"

(—CM Smillie)

Minimize feedback inhibition by baroreceptors or "FIL"
Stress, left brained thinking, pain

Frequent oxytocin release

- Increases alveolar emptying
- Increases *rate* of milk production
- The conscious mind is not in control
- Love, laughter, joy

Oft-heard pumping "rules"

1. Pump at least 8 times a day, every 3 hours
2. Pump at least 15 minutes each breast
3. Pump at least 100 minutes each day
4. You must pump at night
5. To increase milk, you must use a good electric pump
   - A good hospital grade pump *is better than*
   - a personal electric double pump, *which is better than*
   - a manual pump, *which is better than*
   - manual expression

Alveolar emptying: Pumping strategies

Why pumping by the clock doesn't work any better than nursing by the clock

Oxytocin issues

- More MERs → more milk release
- Left brain interferes with oxytocin release
- The conscious brain is not in charge
- So: no clocks, no minutes, no rules

Of pumps and hands

Hospital grade pumps, personal electric double pumps, manual pumps and manual expression

Issues to consider

- Alveolar emptying
- Maternal confidence issues
- Positive pressure and negative pressure
- Neurosensory stimulation
- Positive feedback and oxytocin release
- When milk production is low

Manual pumps

Study of NICU moms
Hand pumps can do well even in the 24/7 pumping of a NICU setting

Lucas A, PEDIATRICS 107(6):1291-1297, June 2001.

Alveolar emptying: Pumping strategies

Zen and the art of pumping or hand expression

Pumping and hand expression: smarter, not harder

- Right-brained pumping and issues of "time"
  - Frequent brief pumping sessions
  - No strict pumping rules, keep it easy
- "Interrupted" and "cluster" pumping
- Heat, showers, compresses
- Breast compression
- Manual expression
- A day of "pumping like crazy"

Breast massage

Positive pressure aids milk removal, especially with small volumes

Probably pushes oxytocin release too, via neurosensory stimulation.

Study (N=36) of pump-dependent NICU moms

Jane Morton, Pediatric Academic Society meetings, Toronto, May 2007

- Compared pumping with or without breast massage first
- No significant change in pumping frequency or duration.
- Breast massage increased daily pump volumes by 200 to 300 ml in 86% of the moms

Hand expression

Hand expression: Better alveolar "emptying

Electric pumps "vacuum" the milk out

- Work best on fuller ducts
- Emptier ducts are probably merely stretched thinner by vacuuming?
- The drop sitting on the end of the nipple experience

Hands can press the milk out

- Can press on emptier milk ducts
- Moves the drop that the electric pump couldn't budge
- And then more milk follows!
- CREAMIER MILK, TOO!

Hand expression

Jane Morton's studies,
Pediatric Academic Society meeting May 2007

Early hand expression in mothers of tiny preemies

- Taught hand expression first day for use in first 3 days
- Those who used hand expression > 5 x/d addition to pumping
- Had nearly twice as much milk at 2 weeks than if only pumping

Breast massage / hand expression increase milk output

- Also mothers of tiny preemies
- Taught hand expression when baby was 10 days to a month old
- No change in frequency or duration of pumping
- Increased daily milk output by average of 11 oz

Teaching hand expression

Demonstrate and/or use video resources

- Picture = 1000 words; Video = 1 million
- The hands learn, not the brain

Resources

- Online streaming video--Jane Morton
  http://newborns.stanford.edu/Breastfeeding/HandExpression.html
- DVDs
  Joan Fisher–
  http://pages.ca.inter.net/~jfisher/sales.html#dvd
  Kittie Frantz–
  http://www.geddesproduction.com/breast-feeding-handexpress.html

Teaching hand expression

Expect it to take a little time

- Have to learn the "feel" of it
- Then it's easy

First time, keep expectations low

- NORMAL to be klutzy and not see much at first
- Normalize a slow start

I often start with how 'everyone' does it wrong

- Tendency is to slide fingers over skin towards nipple
- Then pinch behind nipple
- Slides right over milk, then pinches nipple shut

Instead, demonstrate

- "Pac-man" motion, "squirt gun"
- Press into the breast, against chest wall

Teaching hand expression

Prepare the breasts: brief massage

Fingers press back toward chest wall
- Press into the breast, NOT toward nipple

"Prime the pump"
- First presses pump the milk along the ducts
- Expect no milk at first

Alternate back and forth between breasts
- Move to different sites "around the clock"

Fingers figure out where to press
- May be closer to nipple or further back
- Takes time for fingers to learn this

Hand Expression: Better than domperidone

Pumping issues:
- That recalcitrant drop of milk that just sits on the end of her nipple, not dropping off
- Vacuuming can't remove it
- Frustration fights oxytocin

Hand expression:
- Positive pressure
- Presses that milk out
- Then oxytocin release

Of herbs and medications

Galactogogues
- Metoclopramide, 10 mg 3x/day
- Domperidone, 20 mg 4x/day
- Fenugreek, 1.2 - 3 gm (2-4 capsules) 3 or 4x/day
- Blessed thistle, given with fenugreek
- Fennel
- (Milk thistle?)
- Barley, oatmeal, hops, etc.
- Goat's rue

Of herbs and medications

Importance overemphasized

Do not increase milk production by themselves

Work by increasing prolactin

Do not increase prolactin surge—
only increase baseline prolactin

CAN make alveolar emptying strategies more effective

CanNOT increase milk production
without ***increased alveolar emptying***

Are never necessary to *maintain* milk production

Are only helpful when *increasing* milk production

Cannot increase milk *production without increased alveolar emptying*

What do we need to increase alveolar emptying?

Oxytocin!

How do we increase oxytocin?
- *Confidence*
- *Love*
- *Laughter*
- *Skin on skin*
- *(synthetic oxytocin)*

Address the primary problem

- Maternal confidence, mood issues, etc.
- Infant ankyloglossia
- Maternal sore nipples (injury or infection)
- Infant issues: IBCLC help
  - Often complicated by maternal confidence issues
  - Usually quite difficult before baby "caught up"
    Lower energy: trouble learning
  - Increasing flow helps baby feedback

Change the paradigm

- Mothers don't make milk; babies do
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  only a varying rhythm of milk production
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