

Nancy Mohrbacher
Breastfeeding Reporter

Questions? E-mail:
nancymohrbacher@gmail.com

Reporting on
breastfeeding trends at:
www.NancyMohrbacher.com
www.BreastfeedingMadeSimple.com

Like me on Facebook! 😊

The slide features a pink background with a close-up of a person's skin. At the top right is a small illustration of a woman breastfeeding a baby. The text is arranged in a clear, professional layout.

Mothers in the Workplace
The International Perspective

- U.S.—Family and Medical Leave Act
 - Up to 12 weeks unpaid leave
 - If employer has ≥50 employees
- Other countries
 - Mexico—12 weeks, 100% salary
 - Japan—14 weeks, 60% salary
 - UK—26 weeks paid, 26 weeks unpaid
 - Norway—42 weeks, 100% salary or 52 weeks, 80% salary

A blue globe of the world is shown in the background, with puzzle pieces visible on its surface.

Breastfeeding and the U.S. Workplace

A close-up photograph of the American flag waving, with the stars and stripes clearly visible.

Breastfeeding initiation & duration lower in mothers working full time

At 6 mo, duration 19% lower than non-employed mothers

Ogbuanu, et al. *J Hum Lact* 2011; 27(3):225-238

A woman with curly hair is shown in profile, looking down at a document she is holding. She is wearing a white collared shirt.

Employment a common reason given for early weaning

Taveras, et al. *Pediatrics* 2003; 112:108-115

Worksite lactation support a proven effective intervention

Shealy, et al. *CDC Guide to Breastfeeding Interventions*, 2005

A woman is shown from the side, operating a large office copier or printer. She is wearing a dark jacket.

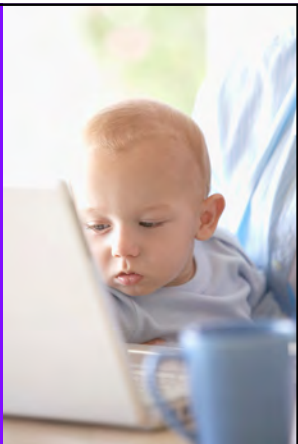


U.S. Workplace Lactation Legislation

- Some states require breaks and private space for pumping
- National healthcare law mandates a time & place to express milk in companies ≥ 50 employees

Work Setting Disparities

Lactation support is most available to office workers in large companies



Work Setting Disparities



In small companies & other settings, many mothers are underserved

- Retail clerks
- Farm workers
- Waitresses
- Factory workers
- Bus drivers

Work Setting Disparities

Low-income women

- Little maternity leave
- Unable to afford a quality breast pump



Helping Mothers Plan During Pregnancy



Breastfeeding Does Not Have to Be All or Nothing

Only Mother's Milk

Mother breastfeeds at work

- Keeps baby with her
- Goes to baby for feedings
- Baby brought to her



Only Mother's Milk

Reverse cycle nursing

- Baby feeds most when mom's home
- Takes longest sleep stretch while mom's at work



Only Mother's Milk


Express milk

- At work
- At home
- Both

for all missed feedings



**When Apart,
Some Mother's Milk,
Some Formula**




**Breastfeed When Together,
Formula-Feed When Apart**



**Length of
Maternity Leave**

**Short maternity leave,
shorter breastfeeding
duration**

- < 6 wk-2 mo
↓ duration
Noble, et al. *Acta Paediatr*
2001; 90:423-28
- >13 wk ↑ duration
Ogbuanu, et al. *Pediatrics*
2011;127(6):e1414-27



Work Schedule




Flexibility?

- ✓ Part-time
- ✓ Job-sharing
- ✓ Flex-time
- ✓ Phase back part-to full-time
- ✓ Compressed work week (more hours, fewer days)
- ✓ Work from home or telecommute
- ✓ On-site day care, bring baby to work

Worksite Lactation Support

- A surprising reason it is not more available:
 - Most women don't ask for it
- Employers provide what employees value AND ask for



How Common Is It?

Medical Benefit* / Program	All	Large
Chiropractic*	56%	50%
Accupressure/Acupuncture*	33%	35%
Prenatal program	25%	41%
Weight-loss program	25%	41%
Lactation program	19%	28%
Dry cleaning services	12%	21%
Pet insurance	5%	10%

Source: Burke, SHRM Benefits Survey 2005

Worksite Lactation Support Is a Win-Win

Saves companies \$\$\$ because:

- Women return to work earlier
- Fewer health-care dollars spent
- Fewer sick days are taken
- Employees report greater job satisfaction
- Companies report reduced staff turnover

Cohen, et al. *Am J Health Promo* 1995; 10:148-53
Cohen, et al. *Am J Health Promo* 1994; 8:436-41

The Business Case for Breastfeeding



Government toolkit includes:

- Color brochures for CEO, HR Dept., employed mothers
- Order free at www.hrsa.org (Search: "The Business Case for Breastfeeding")

Worksite Lactation Support Doesn't Have to Be 'All or Nothing'

- Privacy screen in manager's office
- Unpaid break time to express milk
- Creative use of vacation, sick days, holidays to ease into work



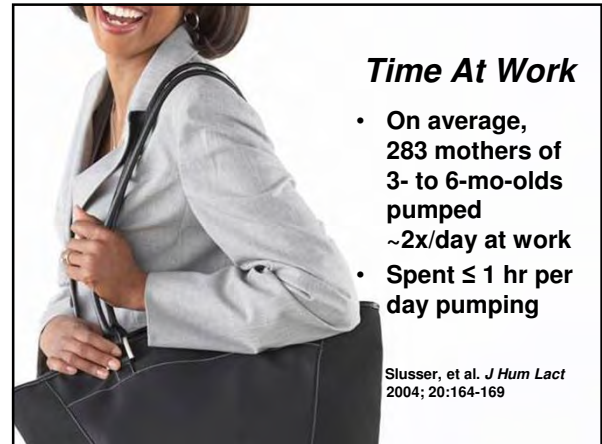


Time At Work

Breastfeeding: ~20-30 min/feeding

Milk expression

- 10-15 min per breast, 5 min clean-up
- Calculate number of daily pumps:
Divide hr apart (include travel) by 3
(9 hr ÷ 3 = 3 pumpings)



Time At Work

- On average, 283 mothers of 3- to 6-mo-olds pumped ~2x/day at work
- Spent ≤ 1 hr per day pumping

Slusser, et al. *J Hum Lact* 2004; 20:164-169




Time At Work

- On average, 462 employed mothers pumped 6.3 mo
- Mean age of infant when they stopped pumping: 9.1 mo

Ortiz, et al. *Pediatr Nurs* 2004; 30:111-119

Milk Storage at Work

- If room is 66-72°F, milk good 6-10 hours
- If room is 73-79°F, milk good 4 hours
- If warmer, use
 - Pump cooling compartment
 - Cooler bag
 - Refrigerator
- Human milk is NOT a biohazardous material (OSHA, CDC, AAP)



**After Birth
When Together,
Breastfeed**



Milk Removal Key to Milk Production

First 40 days, milk increases exponentially

- From ~1 oz on Day 1
- To 25-35 oz at ~5 wk

Milk removal pattern plays major role in milk production

Degree of Breast Fullness

Daly. *Exp Physiol* 1996; 81:861-875

- Drained breasts make milk faster
- Full breasts make milk slower (FIL + pressure)



Breast Storage Capacity

Daly, S. *Exp Physiol* 1993; 78: 209-20



Large capacity
Takes more milk & time to fill



Small capacity
Takes less milk & time to fill

Affects # of milk removals needed per day to establish & maintain milk production



Storage Capacity & Working Mom

Large capacity


- Can go longer before feeling full
- May not need to pump as often
- If very large, may not need to pump at all



Storage Capacity & Working Mom

Small capacity

- Breasts feel full sooner
- Needs to pump more often to maintain production



Preparing to Return to Work

Pumps, Bottles, and Daily Routines

Expressing Milk

Wait 3-4 wk to start giving a bottle

- Pump to comfort as needed and store
- Overpumping & oversupply, pros and cons



When home, avoid schedules



Milk Reserve

Store milk ~3-4 wk prior


- To practice with pump and build reserve
- Pump 1x/day for 3 wk = milk for first day + a good reserve
- At work, milk pumped can be fed next day

Choosing a Pump

- For full-time work, automatic double pump with 40-60 cpm
- Local availability for low-income women varies



- For part-time work, less effective pumps may suffice
- Avoid used or borrowed pumps




Access to quality personal breast pumps increased breastfeeding rates by 54% among low-income, African-American women in Boston

Chamberlain. *J Hum Lact* 2006; 22:94-103

WIC mothers given a rental-grade pump were:

- 5.5x more likely to not ask for formula by 6 mo
- 3x more likely to not ask for formula at 12 mo



Meehan, et al *J Hum Lact* 2008; 24:150-58


Pump Fit

28% of UK NICU mothers needed larger nipple tunnel

Jones, et al. *Arch Dis Child Fetal Neonatal Ed* 2001; 85(2), F91-95


In US study

- 51% went larger at first
- 77% later in lactation



Meier, et al. *Medela Messenger* 2004; 21:8-9

Nipple expansion may change pump fit over time
 Pre-pumping nipple: 20.6 mm
 Post-pumping nipple: 23.8 mm



Photos: The Breastfeeding Atlas

A larger tunnel diameter is needed when, even when centered, her nipple rubs along its sides

Good fit = enough but not too much space around the nipple




Photos: The Breastfeeding Atlas

Photos: The Breastfeeding Atlas




Need a larger tunnel when:

- ✓ Nipples at rest are \geq nickel diameter (If \geq quarter, go to largest size)
- ✓ Nipples rub along tunnel
- ✓ Pumps less milk or takes longer
- ✓ Discomfort even on low suction

Need a smaller tunnel when:

- ✓ Nipples at rest are \sim pencil eraser
- ✓ $>1/4$ inch of areola drawn into tunnel
- ✓ Hard to maintain a seal—breast bounces in and out of tunnel
- ✓ Discomfort even on low suction



Set pump at highest comfortable suction: no higher & no lower
Ramsay, et al. *Breastfeed Med* 2006; 1:14-23

- To get there, turn up vacuum until slightly uncomfortable, then turn down a bit
- If she's gritting her teeth or is sore after, it's too high!

Pumping Effectiveness



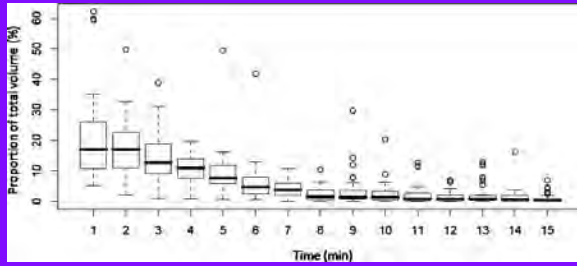
Triggering milk ejection reflexes (MERs) is key

Range 2-14
Average: 5

Photo credit: The Breastfeeding Atlas

Flow Patterns Vary Among Mothers

Prime, et al. *Breastfeed Med* 2011; DOI: 10.1089/bfm.2011.0013; N=34



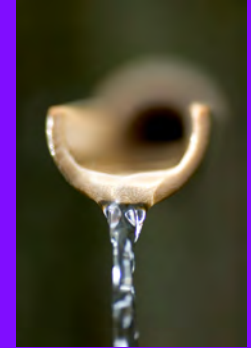
But timing, pattern, and number of milk ejections were consistent for each mother

How Many Minutes Should She Pump?

Prime, et al. *Breastfeed Med* 2011; DOI: 10.1089/bfm.2011.0013; N=34

Individualize pumping instructions

To find best pumping length, pump a few times & watch milk flow



Adding Hands to Pump

- Increases milk yield by >48%
Morton, et al. *J Perinatol* 2009; 29(11): 757-764
- Milk-fat content ~double the average
Morton, et al. *J Perinatol* 2012; Jan 5: 1-6



If Her Breast Pump Is Not Effective

For 1/3 of mothers less of the available milk was removed during pumping than during an average breastfeeding.

Try another pump or hand expression



Prime, et al. *Breastfeed Med* 2011; DOI: 10.1089/bfm.2011.0013; N=34

Average Milk Intake by Age

Baby's Age	Average Volume of Milk Per Feeding	Average Milk Intake Per Day
First week	1-2 oz	10-20 oz (after Day 4)
1-3 weeks	2-3 oz	15-25 oz
1-6 months	3-5 oz	25-35 oz

Milk Per Pumping

Between regular feedings

- 30-60 min after nursing
- Expect ~ half a feeding
- Feeding amount varies by baby's age

When pumping at a usual breastfeeding time

- Expect a full feeding
- Varies by baby's age



Milk Storage Volumes

- Start with 3-4 oz per container
 - Some 1-2 oz batches if baby wants more
 - Can add more, but shouldn't save leftovers
- Adjust volume to what baby takes



Key Milk Production Facts

A breastfed baby's milk intake:

- ↑ Increases from Birth to Week 5
Hill, et al. *J Hum Lact* 2005; 21(1):22-30
- ↔ Plateaus until 6 mo
- ↓ Decreases when other foods started



Peak milk intake averages
~ 25-35 oz/day

Over time, baby's
rate of growth slows

Between 1 & 6 mo,
breastfed baby
needs ~ same
volume of milk/day



Butte, et al. *J Pediatr* 1984; 104:187-95. Neville, et al. *Am J Clin Nutr* 1988; 48:1375-86.

On average, formula-fed babies
consume much more milk:

- 15% @3 mo
- 23% @6 mo
- 20% @9 mo
- 18% @12 mo



Heinig, et al. *Am J Clin Nutr* 1993; 58:152-61



Bottle flows faster,
more consistently

- Overrides baby's appetite control mechanism
- May contribute to overfeeding, obesity

Taveras, et al. *Pediatrics* 2006; 118:2341-48
Li, et al. *Pediatrics* 2008;122, Suppl 2, S77-84
Li, et al. *Pediatrics* 2010; 125:e1386

Relationships & Bottle-Feeding

There's LOTS more going on than baby's
age, type of bottle used



Photo: *The Breastfeeding Atlas*

No Magic Bottle

- Start with slow flow
- Try different types and styles (oral reach)
- See what baby prefers



Flow Affects Baby's Milk Intake

To avoid overfeeding use horizontal feeding technique and slowest flow nipple

- Minimize milk needed to feel full
- Trigger appetite control mechanism with less milk



If baby will not take a bottle, use another feeding method





Photo: *The Breastfeeding Atlas*

The Magic Number

Total # of milk removals per day needed to maintain production long term

Main factor: breast storage capacity

Mohrbacher. *Clin Lact* 2011; 2(1):15-18




The Magic Number

During maternity leave, start by counting breastfeedings per 24 hr

Gives idea of storage capacity

And # milk removals per day needed to maintain long-term production

Mohrbacher, N. *Clin Lact* 2011; 2(1):15-18




The Magic Number

After returning to work, try to keep daily total steady

Daily total = breastfeedings + milk expressions

Mohrbacher. *Clin Lact* 2011; 2(1):15-18





Many mothers pump enough at work but don't breastfeed enough at home

As daily total drops, milk production slows

The breastfed baby does not take fewer & larger feedings during 1st 6 mo

This is a bottle-feeding pattern



Kent, et al. Pediatrics 2006;117: e387-95

Spectrum of Normal

	Largest Capacity	Large Capacity	Average Capacity	Small Capacity	Smallest Capacity
# milk removals/day to increase milk	4-5	6-8	8-10	10-11	≥12
# milk removals/day to maintain milk	3-4	5	6	7	8
# milk removals/day to decrease milk	2	3	4-5	6	7

Spectrum of Normal

	Largest Capacity	Large Capacity	Average Capacity	Small Capacity	Smallest Capacity
Maximum longest stretch	10-12 hr	8-10 hr	8 hr	6-7 hr	4-5 hr
Maximum pump yield	10-12 oz	5-9 oz	3-5 oz	2-3 oz	1-2 oz
Type of pump	?	?	?	?	?
Response to pump	?	?	?	?	?

Easing the Transition



- Start work on a Thurs or Fri, short days, or part-time
- Buy extra pump parts for less washing at work



With a strong mother-baby bond, the return to work can be emotional

- Baby has no sense of time
- Feeding, sleeping patterns may change
- Give more skin-to-skin, focused attention




**Calculating
Milk Needed**

Total: ~30 oz/24 hr
Mother away 8 hr

- 8 hours is 1/3 of 24
- 1/3 of 30 oz = 10 oz

Average—may be more or less

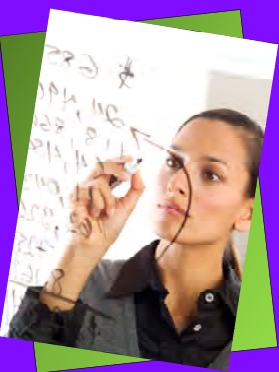


**Calculating
Milk Needed**

Total: ~30 oz/24 hr
Mother away 12 hr

- 12 hours is 1/2 of 24
- 1/2 of 30 oz = 15 oz

If apart 8-12 hr,
baby needs ~10-15 oz



**If Baby Takes Much More,
Find Out Why**




Bottle too full, milk discarded

Over-feeding

Too little breast-feeding

**When Helping an
Employed Mother**

Expand your focus beyond her number of milk expressions at work





Impact of the Longest Stretch



- Always ask its length
- “Full breasts make milk slower”
- Usually occurs at night
 - May be ≥ 12 hr
 - 8 hr works for most

Focus on 24-Hour Day

- ~ 30 oz needed/day
- After 1 month, 3-4 oz is the average milk volume per breastfeeding



MORE BREASTFEEDING when together means LESS EXPRESSED MILK NEEDED when apart

Every breastfeeding added



= 3-4 oz LESS milk needed at work




Every breastfeeding dropped



= 3-4 oz MORE milk needed at work



The Magic Number



Many mothers pump enough at work, but don't breastfeed enough at home

As daily total drops, milk production slows



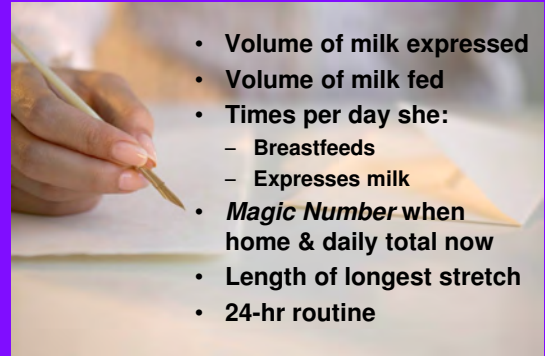
Troubleshooting with Employed Breastfeeding Mothers

“My baby is taking more milk than I pump at work. What should I do?”

~What is your first response?~



Before answering, ask:



- Volume of milk expressed
- Volume of milk fed
- Times per day she:
 - Breastfeeds
 - Expresses milk
- **Magic Number** when home & daily total now
- Length of longest stretch
- 24-hr routine

May Also Need to Know...



- Is baby eating solids?
- Pumping issues?
 - Pump quality, malfunction, fit
 - Milk-ejection issues
- Galactagogues used?
- Mother or baby health issues, meds (birth control)?

1: “Jen” & “Colin”

“My baby is taking more milk than I pump at work. What should I do?”

Baby Colin 10 wk old

Jen@work full-time 2 wk ago



1: “Jen” & “Colin”

Goal: Breastfeed 1 yr

Magic Number @home: 8

Apart 8 hr

- Colin taking 20 oz EBM; Jen can't keep up
- Jen pumps 12 oz at work

Expected volume

- 8 hr apart = 10 oz



1: “Jen” & “Colin”

Breastfeeds 1x am, 2x pm, pumps 2x at work, sleeps 8 hr per night

- Now daily total = 5 (*Magic Number 8*)

Colin is fed 4 5oz bottles

- 1 at arrival at caregiver
- 2 during day
- 1 just before Jen arrives

What is the issue?

What can Jen do?



2: “Abby” & “Beth”

“My baby is taking more milk than I pump at work. What should I do?”

Baby Beth 6 mo old

Abby@work full-time 4 mo ago

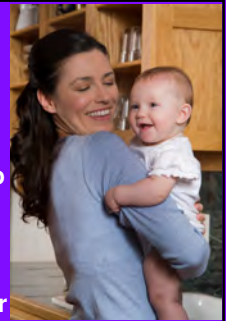


2: “Abby” & “Beth”

Goal: Breastfeed 1 yr
Milk production issues @3 mo
Magic Number @home: 8-10
Early, Beth slept 10-12 hr

Abby@work @2 mo, apart 8 hr

- Milk production dropped right away
- Pumped at night so as not to wake Beth
- Used galactogogues to boost milk production



2: “Abby” & “Beth”

Abby dropped night pumps

- Longest stretch: 10-12 hr

When galactogogues stopped, milk production drops, uses formula

Dropped feedings over time

Now daily total = 5

(Magic Number: 8-10)

- Pumps 2x at work, breastfeeds 3x at home
- Pumping 6 oz at work, Beth takes 12 oz

What is Abby’s issue?



3: “Josie” & “Claire”

“I pump less milk at work than I used to. What can I do?”

Baby Claire 8 mo old

Back to work full-time 5 mo ago



3: “Josie” & “Claire”

Goal: Breastfeed 1 yr

Magic Number: 8

Josie@work 3 mo, away 9 hr

Production stable until ~6.5 mo

- Was pumping 12 oz, now 9 oz
- Now, daily total: 8
- 3 pumps at work
- 5 breastfeedings at home
- Longest stretch: 8 hours

What’s affecting production?



3: “Josie” & “Claire”

What’s affecting production?

Breastfed babies’ milk intake

- Increases birth to Week 5
- Plateaus (until ~6 mo)
- Decreases when foods started

Questions to ask:

- Is Claire taking solid foods?
- If so, how much? (~3 oz/day)

Does Josie need to increase milk?



To Increase Milk Production



The sooner, the better

- **Check flange fit**
Jones, et al. *Arch Dis Child Fetal Neonatal Ed* 2001; 85:F91-95
- **Use hands-on pumping**
Morton, et al. *J Perinatol* 2009; 29(11), 757-764
 - Drained breasts make milk faster
- **Increase daily total**
 - Breastfeed more
 - Pump more
- **Galactagogues**

One Size Does Not Fit All

Different strategies address differences in:

- Breast storage capacity
- Responsiveness to pumping
- Factors as yet unknown

