Clinical Management of the Breastfeeding Infant and Mother

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Objectives

- Review the physiology of lactation.
- Evaluate the benefits and drawbacks of breastfeeding for both mother and baby.
- Identify common causes of weight loss in the breastfed neonate.
- Examine a nursing infant and evaluate latch and breastfeeding technique.
- Recognize common causes of breast pain in the lactating mother and initiate appropriate treatment.
- Discuss the clinical manifestations and management of breastmilk jaundice.
Overview

- AAP recommends 6 months of exclusive breastfeeding
  - continue breastfeeding for minimum of 12 months
- WHO recommends breastfeeding up to 2 years of age and beyond\(^1\)
- Provider education in breastfeeding-related topics increases rates of breastfeeding in patients and improves clinical outcomes\(^2\)
- Formula feeding, while a valid and sometimes necessary form of infant feeding (e.g., galactosemia, HIV), will not be discussed in detail in this presentation
Infant benefits of breastfeeding

- Protects against diarrhea, respiratory infections, and otitis media
- Decreased rates of allergic rhinitis, atopic dermatitis, asthma
- Lower risk of type 1 diabetes, Crohn’s disease, and ulcerative colitis
- Protective against development of childhood cancers
  - especially lymphoma, ALL, and AML
- Decreased risk of SIDS
- Decreased risk of obesity and atherosclerosis
- Prolactin in breastmilk assists in maturation of the neuroendocrine and immune systems
Maternal benefits of breastfeeding

- Decreased rates of postpartum depression
- Decreased risk of type 2 diabetes
- Lower risk of breast and ovarian cancer
- Enhanced bonding and interaction with infant
  - oxytocin effect
Drawbacks of breastfeeding

- BREASTFEEDING IS HARD!!!
- Lack of postpartum support can make it harder
- Total reliance on mother for nourishment
- Can be time-consuming
# Mother’s reasons for stopping breastfeeding

<table>
<thead>
<tr>
<th>Reasons Cited as Important</th>
<th>Infants’ Age When Breastfeeding Was Completely Stopped (mo)</th>
<th>Average Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 1</td>
<td>1-2</td>
</tr>
<tr>
<td><strong>Lactational factor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My baby had trouble sucking or latching on</td>
<td>53.7</td>
<td>27.1</td>
</tr>
<tr>
<td>My nipples were sore, cracked, or bleeding</td>
<td>36.8</td>
<td>23.2</td>
</tr>
<tr>
<td>My breasts were overfull or engorged</td>
<td>23.9</td>
<td>12.3</td>
</tr>
<tr>
<td>My breasts were infected or abscessed</td>
<td>8.1</td>
<td>5.7</td>
</tr>
<tr>
<td>My breasts leaked too much</td>
<td>14.1</td>
<td>8.0</td>
</tr>
<tr>
<td>Breastfeeding was too painful</td>
<td>29.3</td>
<td>15.8</td>
</tr>
<tr>
<td><strong>Nutritional factor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast milk alone did not satisfy my baby</td>
<td>49.7</td>
<td>55.6</td>
</tr>
<tr>
<td>I thought that my baby was not gaining enough weight</td>
<td>23.0</td>
<td>18.3</td>
</tr>
<tr>
<td>A health professional said my baby was not gaining enough weight</td>
<td>19.8</td>
<td>15.2</td>
</tr>
<tr>
<td>I had trouble getting the milk flow to start</td>
<td>41.4</td>
<td>23.2</td>
</tr>
<tr>
<td>I didn’t have enough milk</td>
<td>51.7</td>
<td>52.2</td>
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<tr>
<td><strong>Psychosocial factor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeeding was too tiring</td>
<td>19.8</td>
<td>17.2</td>
</tr>
<tr>
<td>Breastfeeding was too inconvenient</td>
<td>20.4</td>
<td>22.4</td>
</tr>
<tr>
<td>I wanted to be able to leave my baby for several hours at a time</td>
<td>11.2</td>
<td>24.1</td>
</tr>
<tr>
<td>I had too many household duties</td>
<td>12.6</td>
<td>14.0</td>
</tr>
<tr>
<td>I wanted or needed someone else to feed my baby</td>
<td>16.4</td>
<td>23.2</td>
</tr>
<tr>
<td>Someone else wanted to feed the baby</td>
<td>13.5</td>
<td>15.5</td>
</tr>
<tr>
<td>I did not want to breastfeed in public</td>
<td>14.9</td>
<td>18.6</td>
</tr>
<tr>
<td><strong>Lifestyle factor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I did not like breastfeeding</td>
<td>16.4</td>
<td>10.9</td>
</tr>
<tr>
<td>I wanted to go on a weight-loss diet</td>
<td>6.6</td>
<td>7.2</td>
</tr>
<tr>
<td>I wanted to go back to my usual diet</td>
<td>5.5</td>
<td>9.5</td>
</tr>
<tr>
<td>I wanted to smoke again or more than I did while breastfeeding</td>
<td>6.0</td>
<td>5.2</td>
</tr>
<tr>
<td>I wanted my body back to myself</td>
<td>8.9</td>
<td>13.2</td>
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<tr>
<td><strong>Medical factor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My baby became sick and could not breastfeed</td>
<td>9.5</td>
<td>7.4</td>
</tr>
<tr>
<td>I was sick or had to take medicine</td>
<td>14.4</td>
<td>16.3</td>
</tr>
<tr>
<td>I was not present to feed my baby for reasons other than work</td>
<td>3.2</td>
<td>6.9</td>
</tr>
<tr>
<td>I became pregnant or wanted to become pregnant again</td>
<td>1.7</td>
<td>3.4</td>
</tr>
<tr>
<td><strong>Milk-pumping factor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I could not or did not want to pump or breastfeed at work</td>
<td>11.2</td>
<td>22.4</td>
</tr>
<tr>
<td>Pumping milk no longer seemed worth the effort that it required</td>
<td>16.7</td>
<td>21.2</td>
</tr>
<tr>
<td><strong>Infant’s self-weaning factor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My baby began to bite</td>
<td>5.2</td>
<td>5.7</td>
</tr>
<tr>
<td>My baby lost interest in nursing or began to wean himself or herself</td>
<td>13.2</td>
<td>19.7</td>
</tr>
<tr>
<td>My baby was old enough that the difference between breast milk and formula no longer mattered</td>
<td>5.2</td>
<td>11.4</td>
</tr>
</tbody>
</table>
**Case #1**

**History:** 5 day old male infant presents to pediatric office for newborn exam. Full term vaginal birth without complications. He is exclusively breastfeeding, nursing every 2-3 hours. In the past 24 hours, he has had 4 wet and 1 stool diapers. Mother is complaining of painful nursing throughout the feeds.

**Vitals:** wt 2805 (BW 3000 g) (6.5% wt loss), T 97.8, R 46, P 154

\[
\text{birth weight – current weight \over birth weight} \times 100\% = \text{percent weight lost}
\]

**Physical:** Well-appearing infant crying inconsolably. No jaundice or rash. Otherwise unremarkable exam.
Painful nursing

- IT SHOULD NOT HURT TO BREASTFEED!!!
  - normal nipple sensitivity in the first 4 days, lasts 30-60 seconds
  - pain throughout the feeding demands immediate attention
- Treat the underlying cause of cracked nipples
  - evaluate the latch
  - do not overwash nipples
  - leave bra open to “air out”
  - halobetasol 0.05% after every feed x 2 days
- Evaluate for thrush/candidiasis
  - pain out of proportion to exam
  - shiny/flaky skin of the affected nipple
  - consider if hx of vaginal yeast infection or infant with thrush
Anatomy of the breast

- Nipple contains approximately 25 milk ducts emptying through 6-8 openings
- Lymphatic drainage to the axillary nodes
- The size of the breast does not predict milk production
Milk transfer

- During suckling, the infant pulls the nipple and part of the areola into the oral cavity, forming a teat.
- The tongue then undulates in a peristaltic motion in a suck-swallow (breathe) cycle to allow for milk extraction.
- Positive pressure of the tongue against the teat, coupled with ejection of the milk from increased intraductal pressure, evacuates the milk.
- Negative pressure holds the teat in the mouth.
Ankyloglossia

- “Tongue tie”
- Sublingual frenulum prevents anterior extension and elevation of the tongue
  - due to lack of elasticity, attachment site, decreased length
- 4% of term infants at birth
  - 13% of infants with breastfeeding problems
- Also associated with speech difficulties
- Frenotomy may decrease nipple pain and improve latch
Observing a nursing infant

- Position of mother
  - monitor body language and tension
  - pillows may provide support
- Position of infant
  - tummy to tummy
  - infant cannot swallow if the head has to turn to the breast
- Position of mother's hand on breast

Observing a nursing infant

- Lips should be flanged
- Infant responds to lower lip stimulus by opening mouth wide
- Asymmetric latch
- Look for motion of masseter muscle during suckling
  - will hear sounds of swallowing
- Ratio of sucks to swallow should move to 1:1 as feeding progresses
- Mother should be comfortable with no breast pain

https://www.womenshealth.gov/breastfeeding/learning-breastfeed/getting-good-latch
Case #2

**History**: 3 day old male infant presents to pediatric office for newborn exam. Full term vaginal birth without complications. He is exclusively breastfeeding, nursing every 2-3 hours. In the past 24 hours, he has had 4 wet and 3 stool diapers. Mother is concerned because she does not believe she is making enough milk.

**Vitals**: wt 2805 (BW 3000 g) (6.5% wt loss), T 98.8, P 140, R 42

**Physical**: Well-appearing infant sleeping in mother’s arms. No jaundice or rash. Otherwise unremarkable exam.
Neonatal weight loss$^3$

- Breastfed newborns typically lose some weight
- >5% warrants an evaluation to identify any problems
  - identify potential failure-to-thrive before it becomes serious
- Up to 10% weight loss is only acceptable if appropriate amount of voids/stools, normal physical exam, and all else is going well

Estimated percentile curves of percent weight loss by time after birth for vaginal deliveries.
Neonatal weight loss

- Weight gain should be 15-30 g/day after first week
- Only a small volume of colostrum is available the first 24-48 hours
  - newborns have significant stores of energy in body fat
  - they mobilize adequate energy from these sources
- Can do test weight to evaluate for milk transfer

<table>
<thead>
<tr>
<th></th>
<th>First 24 h of Life</th>
<th>Second 24 h of Life</th>
<th>Third 24 h of Life</th>
<th>First 30 Days of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>Loss</td>
<td>Loss 27%</td>
<td>Plateau</td>
<td>Regain birth weight by 10-14 days</td>
</tr>
<tr>
<td>Stools</td>
<td>1 ×</td>
<td>2 ×</td>
<td>3 ×</td>
<td>Minimum of 3 × daily</td>
</tr>
<tr>
<td>Voids</td>
<td>1 ×</td>
<td>2 ×</td>
<td>3 ×</td>
<td>6-8 × daily</td>
</tr>
<tr>
<td>Feeds</td>
<td>8-12 ×</td>
<td>8-12 ×</td>
<td>8-12 ×</td>
<td>At least 8/day</td>
</tr>
</tbody>
</table>
Lactogenesis in pregnancy

- Changes nonsecretory mammary epithelial cells into secretory cells
- Mammary gland only reaches full maturity in pregnancy, by 22 weeks gestation
- Stage I lactogenesis – mammary gland develops ability to produce milk
  - prolactin is high but milk production is inhibited by high progesterone/estrogen
Lactogenesis after delivery

- Stage II lactogenesis – onset of copious milk production at delivery
  - associated with drop in progesterone by 4 days postpartum
  - does not depend on suckling by the infant until day 3-4, when the secretion declines if milk is not removed from the breast
  - when signs of lactogenesis are absent in the first 72 hours a cause should be sought such as diabetes

- Stage III lactogenesis – milk composition changes to mature milk
  - by day 14 postpartum
Hormones involved in lactation

- **Prolactin**
  - released from the anterior pituitary upon nipple stimulation
  - stimulates milk synthesis and secretion

- **Oxytocin**
  - released from the posterior pituitary upon nipple stimulation
  - also released secondary to sensory pathways (baby crying, visualizing the infant, preparing to feed)
  - works to cause the let down reflex for milk ejection

https://courses.washington.edu/conj/bess/hyperprolactinemia/hyperprolactinemia.htm
Hormones involved in lactation

- Progesterone
  - High levels in pregnancy inhibit milk production
  - Does not inhibit established lactation
    - Breast tissue does not contain progesterone-binding sites
- Estrogen
  - Antagonizes prolactin by inhibiting secretion of milk
    - Both in pregnancy and postpartum
Physiology of lactation

- Oxytocin is released (due to sensory pathways and suckling)
  - causes ejection of milk from alveoli and smaller milk ducts into larger lactiferous ducts and sinuses
  - acts on the basket-like myoepithelial cells surrounding the alveoli to cause contraction to expel the milk
- Nipple stimulation causes nervous impulses to travel to hypothalamus
  - stimulates the pituitary gland to secrete prolactin, which induces the alveoli in the breast to produce and secrete milk
  - cell membranes release fat globules and protein into the lumen
    - produces the hindmilk, which has a higher protein and fat content
- Part of the foremilk has been present since the previous nursing
Decreased milk production

- Lack of suckling = decreased prolactin = decreased milk production
- When milk is not removed the increased pressure lessens capillary blood flow and inhibits the lactation process
- Suckling, emptying the breast, and receiving adequate precursor nutrients are essential to effective lactation
Increasing milk supply

- Early skin-to-skin
- Look for feeding cues and nurse on demand
- Increase frequency and duration of breastfeeding
- Hospital grade pump
- Consider use of galactogogues
  - metoclopramide (antagonizes release of dopamine by CNS to increase prolactin)
  - many herbal supplements are lacking research, but are likely safe and somewhat effective (eg. Fenugreek, milk thistle, fennel seeds)
History: 31 year old G1P1 female presents to ED 6 weeks postpartum with right breast pain x 3 days. Complains of fever, muscle aches, and breast redness. Was exclusively breastfeeding, but recently went back to work. Has been pumping 2-3 times in a 9 hour day at work, but only has 5-10 minutes per break.

Vitals: T 102.7, R 22, P 94, BP 118/76

Physical: ill-appearing female in no acute distress; left breast appears normal without rash, no redness, nontender to palpation, generally lumpy tissue, nipple and areola normal, milky discharge is manually expressed from the nipple; right breast has 2x3 cm area of erythema in the lower outer quadrant, firm, tender to palpation, nipple has a small linear crack; right axillary lymphadenopathy is present; remaining exam is unremarkable
Lactational mastitis

- Clinical diagnosis
  - firm, red, tender area of breast +/- lymphadenopathy
  - systemic symptoms – fever, myalgias, malaise, flu-like symptoms
- Typically presents in first 6 weeks
  - due to damaged nipples, infrequent feedings, inefficient milk removal, rapid weaning, oversupply of milk
- Can culture the breast milk if severe case or no response to tx in 48 hrs
  - cleanse nipple first
  - discard initial expressed milk
  - express milk into sterile container
- Staph aureus (MRSA strains) is most common
Differential diagnosis

- Engorgement and plugged ducts
  - breast pain and fullness without systemic symptoms
- Abscess
  - tender area of fluctuance; can be confirmed with US and drained
  - 3% of women with antibiotic-treated mastitis develop abscess
    - more common if breastfeeding is stopped abruptly
- Inflammatory breast cancer
  - skin thickening, erythema, peau d’orange
  - often associated with axillary lymphadenopathy
  - consider workup if mastitis does not resolve as expected
Lactational mastitis treatment

- Continue breastfeeding (ensure complete emptying of the breast)\(^3\)
  - position infant with chin or nose pointing to area of infection
  - pump after feedings to augment milk drainage
  - may use heat prior to nursing to facilitate letdown and milk flow
- Reduce inflammation with NSAIDs and cold compresses after feedings\(^3\)
- Empiric antibiotics x 10-14 days\(^5\)
  - prefer to use dicloxacillin 4 times daily
  - consider coverage for MRSA with Bactrim BID or clindamycin 4 times daily
    - avoid Bactrim in mothers nursing newborns due to increased risk for kernicterus
- should see response within 48-72 hours
Engorgement

- Most commonly days 3-5 postpartum
- Involves 3 elements:
  - 1) congestion and increased vascularity
  - 2) accumulation of milk
  - 3) edema secondary to the swelling and obstruction of drainage of the lymphatic system by vascular increases and fullness of the alveoli
- When infants cannot grasp an engorged areola properly, they will clamp down on the nipple with the jaws
  - causes pain in the nipple and disrupts the ejection reflex
- Manual expression of a little milk will soften the areola
  - allows an easier grasp by the infant
Case #4

**History:** 7 day old male infant presents to pediatric office with new onset yellow skin and eyes for the past 1-2 days. He was full term, vaginal delivery without complications. He is exclusively breastfeeding every 2 hours and nurses well on both breasts. He makes 10 wet and 6 stool diapers daily.

**Vitals:** wt 4000 grams (BW was 3800 grams), T 98.2, P 150, R 46

**Physical:** Well-appearing infant sleeping in father’s arms. Noted to be jaundiced to the face and upper chest, along with scleral icterus. Normal heart and lung sounds. Abdomen soft, nondistended, no masses or organomegaly.

**Labs:** total bilirubin of 18 with elevated indirect and normal direct bilirubin (drawn shortly after breastfeeding)
Breast milk jaundice

- Breast milk jaundice becomes apparent after day 3
  - bilirubin peaks from days 7-10
  - compared to neonatal jaundice, which peaks on day 3 then drops
- Associated with normal stools and no abnormal weight loss
- Causes are currently under investigation
  - possibly due to a substance in the milk of some mothers which prevents the conjugation of bilirubin
  - infant does not produce more bilirubin, just conjugation and excretion seem to be affected
- Total and unconjugated bilirubin are elevated
  - if conjugated, look for other causes
Breast milk jaundice diagnosis

- Draw bilirubin 2 hours after breastfeeding
  - if bilirubin > 16 for more than 24 hours, it is important to establish the diagnosis
- Discontinue breastfeeding for at least 12 hrs (after initial blood draw)
  - continue pumping to maintain supply, infant should be fed formula
  - after at least 12 hours without mother’s milk, recheck bilirubin
    - if drops more than 2 mg/dL, this is diagnostic
- If bilirubin rises while not breastfeeding, it is NOT breast milk jaundice
  - consider hemolytic disease, hypothyroidism, G6PD deficiency, Gilbert syndrome, intestinal obstruction
Breast milk jaundice treatment

- Infant can return to breastfeeding once the level is less than 15
  - recheck bilirubin to ensure it is not rising again
  - should be a slow/steady drop after resuming breastfeeding
- If bilirubin >20 (in full term infant), initiate phototherapy
- Resolves on its own by 12 weeks if breastfeeding is never discontinued and bilirubin is in the “safe zone” (<10-12)
Resources


