BREASTFEEDING 101 FOR PEDIATRIC PRACTICES

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Introduction
Disclosures

• I have no commercial interests or relevant relationships to disclose
Objectives

• Utilize basic strategies to support breastfeeding couplets in the outpatient setting

• Observe and assess a breastfeeding session using a World Health Organization framework
Why breastfeeding is important
How breastfeeding works
Assessing a breastfeed
Observing a breastfeed
Listening and learning
Breast conditions

Breastfeeding Counselling: A Training Course. World Health Organization.
The American Academy of Pediatrics recommends exclusive breastfeeding for 6 months.
Given the documented short- and long-term medical and neurodevelopmental advantages of breastfeeding, infant nutrition should be considered a public health issue and not only a lifestyle choice.  

*Breastfeeding and the Use of Human Milk. AAP, 2012*
Those not breastfed experience more...

minor, major, acute and chronic

...health problems

The Surgeon General’s Call to Action to Support Breastfeeding, 2011
## National Goals

### Healthy People 2020 Objectives

<table>
<thead>
<tr>
<th>MICH**-21: Increase the proportion of infants who are breastfed</th>
<th>Target</th>
<th>Current Rates*</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICH-21.1: Ever</td>
<td>81.9%</td>
<td>81.1%</td>
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<tr>
<td>MICH-21.2: At 6 months</td>
<td>60.6%</td>
<td>51.8%</td>
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<td>MICH-21.3: At 1 year</td>
<td>34.1%</td>
<td>30.7%</td>
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<tr>
<td>MICH-21.4: Exclusively through 3 months</td>
<td>46.2%</td>
<td>44.4%</td>
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<tr>
<td>MICH-21.5: Exclusively through 6 months</td>
<td>25.5%</td>
<td>22.3%</td>
</tr>
</tbody>
</table>

**MICH-22:** Increase the proportion of employers that have worksite lactation support programs.

**MICH-23:** Reduce the proportion of breastfed newborns who receive formula supplementation within the first 2 days of life.

**MICH-24:** Increase the proportion of live births that occur in facilities that provide recommended care for lactating mothers and their babies.

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*Baby-Friendly*

- **47.5%**
- **23.7%**

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*MICH-21 and MICH-23 current rates represent babies born in 2013, National Immunization Survey 2014-2015; MICH-24 current rates represent babies born in Baby-Friendly Hospitals and Birth Centers designated as of June 2016.**

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**Maternal Infant and Child Health**
Why Women Don’t

- Low education
- Lack of role models
- Formula marketing
- Lack of experience
- Modern lifestyle
- No confidence
- Poor support
- Work or school
- Embarrassed

Modern lifestyle
Hospital practices
Lack of experience
Work or school
Lack of role models
Embarrassed
No confidence
Poor support
Formula marketing
Lack of experience
Modern lifestyle
No confidence
Poor support
Work or school
Embarrassed
Formula marketing
Lack of role models
Work or school
Embarrassed
Formula

- Inherent weaknesses
  - Nutrient degradation, expiration
  - Powder not sterile, requires clean water
  - Susceptible to manufacturing and storage errors

source: weatherflow.com
SUMMARY OF THE MAIN POINTS OF THE INTERNATIONAL CODE

1. No advertising of breastmilk substitutes and other products to the public.
2. No free samples to mothers.
3. No promotion in the health service.
4. No company personnel to advise mothers.
5. No gifts or personal samples to health workers.
6. No pictures of infants, or other pictures idealizing artificial feeding, on the labels of the products.
7. Information to health workers should be scientific and factual.
8. Information on artificial feeding, including that on labels, should explain the benefits of breastfeeding and the costs and dangers associated with artificial feeding.
9. Unsuitable products, such as sweetened condensed milk, should not be promoted for babies.
Why breastfeeding is important
How breastfeeding works
Assessing a breastfeed
Observing a breastfeed
Listening and learning
Breast conditions
Mammary Structures

- **Alveoli**
  - Secretory acinar units
  - Grouped into lobules
  - Lobules drain into ductules
  - Ductules drain into ducts
  - Ampulla = small reservoir
  - Lactiferous ducts transport milk to nipple

- **Myoepithelial cells**
  - Contract to eject milk
Mammary Structures

- Surrounding skin
  - Hair
  - Apocrine sweat glands
  - Sebaceous glands

- Areola mammae
  - Montgomery tubercles
    - Hypertrophied sebaceous glands
    - Lactiferous gland

- Papilla mammae (nipple)
  - Muscular projection
  - 2 dozen lactiferous ducts
Milk Secretion

- Transcellular pathways
  - Secretory pathway for proteins (casein and lactalbumin), sugar (lactose) and salts
  - Lipid pathway for short and long chain FA (synthesized and stored)
  - Endocytosis/exocytosis for maternal immunoglobulin A, other plasma proteins

- Paracellular pathway
  - Bioactive cells (leukocytes)
Lactogenesis Stage I

• Pregnancy (week 16 to postpartum day 3)
  – Increase in breast size, alveolar diameter, blood flow
  – Increased serum levels of plasma lactose and lactalbumin
  – Alveoli become distended with colostrum
  – Milk secretion inhibited by high placental progesterone levels
  – After parturition, colostrum secretion begins

Breast changes with pregnancy
Pregnancy: breast weight increases 2-3x baseline
Lactating: breast weight increases 3-4x baseline
Source: thepregnancyzone.com
Lactogenesis Stage II

- Placenta is expelled at parturition

- Progesterone withdrawal initiates lactogenesis II
  - Removes inhibition at the cellular receptor level

- Further increase in lactose concentrations is associated with increased synthesis of milk components

- Transitional milk secretion postpartum days 3-14

Lactogenic hormones

- **Prolactin**
  - Synthesized and secreted by anterior pituitary
  - Found in brain, mammary glands, placenta
  - Primary hormone of milk production and maintenance
  - Release spikes stimulated by infant suckling

- **Supportive metabolic hormones**
  - Thyroid hormones (TSH, TRH)
  - Parathyroid hormone
  - Insulin
  - Cortisol
  - Growth hormone

Source: studyblue.com

The “Let-Down” Reflex
Galactokinesis

- **Oxytocin**
  - Released by posterior pituitary
  - Promotes nurturing behavior, bonding, reduced stress, calm
  - Released in surges with nipple stimulation and other sensory input (tactile, visual, aural stimuli from infant)

**The “Let-Down” Reflex**

Signs of an active letdown reflex
- Squeezing or tingling sensation
- Milk ejection from opposite breast during feed
- Flowing milk if baby releases during feeding
- Pelvic cramping during feeds
- Slow and deep sucks and swallowing by baby

Source: studyblue.com
Galactopoiesis (Maintenance)

• Recovery after parturition
  – Suckling promotes oxytocin release
  – Promotes uterine contraction and involution
  – Decreased postpartum hemorrhage and anemia
  – More rapid weight loss postpartum

• Lactational amenorrhea and anovulation
  – Complex hormonal interactions, can last 24 months
  – Delays fertility, promotes child spacing

• Psychologic effects
  – Bonding, mental health, stress reduction

• Risk reduction
  – Breast and ovarian cancer
  – Osteoporosis, obesity
Post-lactation Regression

- Lack of milk extraction (incomplete/infrequent)
  - Gradual (months) or rapid (days-weeks) wean
- Overall maternal prolactin levels decrease
- Engorgement of alveoli
  - Compresses surrounding blood vessels, reducing flow
  - Diminishes delivery of oxytocin to myoepithelial cells
  - Reduced milk production with engorgement and lower prolactin
  - Secretions in alveoli and ducts reabsorbed
  - Alveoli collapse and glandular elements return to resting state
  - Apoptosis and remodeling return breast to pre-pregnancy state
Milk Composition

- Varies by time of day
- Maternal diet
- Stage of lactation
- Individual differences

- Mature milk
- Foremilk – high water content, protein, vitamins, lactose
- Hindmilk – high fat content
Why breastfeeding is important
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BREASTFEEDING WILL BE SUCCESSFUL IN MOST CASES IF:

- The mother feels good about herself
- The baby is well attached to the breast so that he suckles effectively
- The baby suckles as often and for as long as he wants
- The environment supports breastfeeding
HOW TO ASSESS A BREASTFEED

1. What do you notice about the mother?
2. How does the mother hold her baby?
3. What do you notice about the baby?
4. How does the baby respond?
5. How does the mother put her baby onto her breast?
6. How does the mother hold her breast during a feed?
7. Does the baby look well attached to the breast?
8. Is the baby suckling effectively?
9. How does the breastfeed finish?
10. Does the baby seem satisfied?
11. What is the condition of the mother's breasts?
12. How does breastfeeding feel to the mother?
**Fig. 18 How does the mother hold her breast?**

a. Resting her fingers on her chest wall so that her first finger forms a support at the base of the breast  
b. Holding her breast too near the nipple
Attachment

- Results of poor attachment
  - Pain and damage to nipple
  - Poor milk removal
    - Engorgement
    - Unsatisfied baby, crying
    - Jaundice, weight loss, temperature instability
  - Reduced milk production
    - Failure of lactation

- Causes of poor attachment
  - Use of bottles before breastfeeding established
  - Maternal inexperience
  - Functional problems
    - Small or weak baby
    - Maternal breast anatomy
    - Engorgement
    - Late start
  - Lack of skilled support
    - Community
    - Poorly trained health care providers
Positioning

Modified cradle position

a. Baby's body close, facing breast
   Face to face attention from mother

b. Baby's body away from mother, neck twisted
   No mother baby eye contact
### B-R-E-A-S-T-FEED OBSERVATION FORM

**Signs that breastfeeding is going well**

- **BODY POSITION**
  - Mother relaxed and comfortable
  - Baby's body close, facing breast
  - Baby's head and body straight
  - Baby's chin touching breast
  - [Baby's bottom supported]

- **RESPONSES**
  - Baby reaches for breast if hungry
  - [Baby roots for breast]
  - Baby explores breast with tongue
  - Baby calm and alert at breast
  - Baby stays attached to breast
  - Signs of milk ejection, [leaking, afterpains]

- **EMOTIONAL BONDING**
  - Secure, confident hold
  - Face-to-face attention from mother
  - Much touching by mother

- **ANATOMY**
  - Breasts soft after feed
  - Nipples stand out, protactile
  - Skin appears healthy
  - Breast looks round during feed

- **SUCLING**
  - Mouth wide open
  - Lower lip turned outwards
  - Tongue cupped around breast
  - Cheeks round
  - More areola above baby's mouth
  - Slow deep sucks, bursts with pauses
  - Can see or hear swallowing

- **TIME SPENT SUCLING**
  - Baby releases breast
  - Baby suckled for ____ minutes

**Signs of possible difficulty**

- Shoulders tense, leans over baby
- Baby's body away from mother's
- Baby's neck twisted
- Baby's chin not touching breast
- [Only shoulder or head supported]

- No response to breast
- [No rooting observed]
- Baby not interested in breast
- Baby restless or crying
- Baby slips off breast
- No signs of milk ejection

- Nervous or limp hold
- [No mother/baby eye contact]
- Little touching or
  - Shaking or poking baby

- Breasts engorged
- Nipples flat or inverted
- Fissures or redness of skin
- Breast looks stretched or pulled

- Mouth not wide open, points forward
- Lower lip turned in
- Baby's tongue not seen
- Cheeks tense or pulled in
- More areola below baby's mouth
- Rapid sucks only
- Can hear smacking or clicking

- Mother takes baby off breast
Assisting a Breastfeeding

Always observe a mother breastfeeding before you help her.
Take time to see what she does, so that you can understand her situation clearly. Do not rush to make her do something different.

Give a mother help only if she has difficulty.
Some mothers and babies breastfeed satisfactorily in positions that would make difficulties for others. This is especially true with babies more than about 2 months old. There is no point trying to change a baby's position if he is getting breastmilk effectively, and his mother is comfortable.

Let the mother do as much as possible herself.
Be careful not to 'take over' from her. Explain what you want her to do. If possible, demonstrate on your own body to show her what you mean.

Make sure that she understands what you do so that she can do it herself.
Your aim is to help her to position her own baby. It does not help if you can get a baby to suckle, if his mother cannot.
HOW TO HELP A MOTHER TO POSITION HER BABY

- Greet the mother and ask how breastfeeding is going.
- Assess a breastfeed.
- Explain what might help, and ask if she would like you to show her.
- Make sure that she is comfortable and relaxed.
- Sit down yourself in a comfortable, convenient position.
- Explain how to hold her baby, and show her if necessary. The four key points are:
  - with his head and body straight;
  - with his face facing her breast, and his nose opposite her nipple;
  - with his body close to her body;
  - supporting his bottom (if newborn).
- Show her how to support her breast:
  - with her fingers against her chest wall below her breast;
  - with her first finger supporting the breast;
  - with her thumb above.
  Her fingers should not be too near the nipple.
- Explain or show her how to help the baby to attach:
  - touch her baby's lips with her nipple;
  - wait until her baby's mouth is opening wide;
  - move her baby quickly onto her breast, aiming his lower lip below the nipple.
- Notice how she responds and ask her how her baby's suckling feels.
- Look for signs of good attachment. If the attachment is not good, try again.
Why breastfeeding is important
Local breastfeeding situation
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HELPFUL NON-VERBAL COMMUNICATION

- Keep your head level
- Pay attention
- Remove barriers
- Take time
- Touch appropriately

LISTENING AND LEARNING SKILLS

- Use helpful non-verbal communication
- Ask open questions
- Use responses and gestures which show interest
- Reflect back what the mother says
- Empathize - show that you understand how she feels
- Avoid words which sound judging
How is breastfeeding going?
Are you having any difficulties?
What are you worried about?
Tell me about his wet and dirty diapers.
How is your baby sleeping at night?
It sounds like you are feeling...
CONFIDENCE AND SUPPORT SKILLS

- Accept what a mother thinks and feels
- Recognize and praise what a mother and baby are doing right
- Give practical help
- Give a little, relevant information
- Use simple language
- Make one or two suggestions, not commands
Why breastfeeding is important
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Breastfeeding Counselling: A Training Course. World Health Organization.
Fig. 27 There are many different shapes and sizes of breast. Babies can breastfeed from almost all of them.
Mammary Development

- Morphogenic problems
  - Accessory breast – mammary tissue outside the two major glands
  - Amastia – congenital absence of breast and nipple
  - Amazia – nipple without breast tissue
  - Hyperadenia – mammary tissue without nipple
  - Hypoplasia – breast underdevelopment
  - Polythelia (or hyperthelia) – accessory nipple(s) without breast tissue
  - Symmastia – webbing between breasts
HOW TO EXAMINE A WOMAN'S BREASTS

Not necessary as a routine - only if you or the woman are concerned
If postnatal, examine before breastfeed, or wait until baby finishes
Do the examination gently and modestly.

- Explain what you want to do. Ask the mother's permission.
- Inspect her breasts without touching. Look for:
  - size and shape of breast (may affect confidence)
  - size and shape of nipple (may affect attachment)
  - dripping milk (sign of active oxytocin reflex)
  - full, soft, engorged
  - fissures, white spots
  - redness (inflammation or infection)
  - at end of feed, protracted or squashed
  - scars (breast surgery, previous abscess)
- Ask if she has noticed anything wrong
  If "yes", ask her to point to the place
- If it is necessary to palpate, ask her permission
- Palpate gently all parts of both breasts
  Use the flat of your hand (fingers together and straight)
  Do not pinch or poke
  Watch mother's face for signs of pain or tenderness
  Feel for:
  - generalized fullness, hardness, engorgement
  - localized hardness, hot areas, lumps
- Ask mother to show how easily her nipples stretch out (protract)
  (She places her finger and thumb on the areola either side of
  her nipple, and tries to stretch the nipple out)
- Talk to the mother about what you have found
  Use confidence and support skills
  Do not say anything critical, and do not tell her things that will
  worry her, when it is not necessary to do so
Flat or Inverted Nipples

- Build confidence – difficult at beginning, be patient, bf from breast not nipple
- Encourage STS and exploration
- Help try different positions
- Help make the nipple stand out before feeding – hand stimulation, pump
- If attachment is problematic, teach expression and cup feeding
Engorgement

TREATMENT OF BREAST ENGORGEMENT

Do not "rest" the breast

If baby able to suckle: Feeding frequently, help with positioning.

If baby not able to suckle: Express milk by hand or with pump

Before feed to stimulate oxytocin reflex:
- Warm compress or warm shower
- Massage to neck and back
- Light massage of breast
- Stimulate nipple skin
- Help mother to relax

After feed to reduce oedema:
- Cold compress on breasts
SYMPTOMS OF BLOCKED DUCT AND MASTITIS

Blocked → Milk → Non-infective → Infective duct → stasis → mastitis → mastitis

- Lump progresses
- Tender
- Localised redness to
- No fever
- Feels well
- Hard swelling
- Severe pain
- Red area
- Fever
- Feels ill

TREATMENT OF BLOCKED DUCT AND MASTITIS

FIRST:
- Improve drainage of breast

Look for cause and correct:
- Poor attachment
- Pressure from clothes or fingers
- Large breast draining poorly

Advise:
- Frequent breastfeeds
- Gentle massage towards nipple
- Warm compresses

Suggest if helpful:
- Start feed on unaffected side
- Vary position

THEN:
- If any of these:
  - Symptoms severe, or
  - Fissure, or
  - No improvement after 24 hours
  - Antibiotics
  - Complete rest
  - Analgesics (paracetamol)
### Table 2  TREATMENT OF CANDIDA OF THE BREAST

**Gentian violet paint:**
- To baby's mouth: 0.25% apply daily or alternate days for 5 days or until 3 days after the lesions have healed.
- To mother's nipples: 0.5% apply daily for 5 days.

**OR:**

**Nystatin cream 100,000 IU/g:**
- Apply to nipples 4 times daily after breastfeeds.
- Continue to apply for 7 days after lesions have healed.

**Nystatin suspension 100,000 IU/ml:**
- Apply 1 ml by dropper to child's mouth 4 times daily after breastfeeds for 7 days, or as long as mother is being treated.

Stop using pacifiers, teats, and nipple shields.
HOW TO HELP WITH A BABY WHO CRIES A LOT

• Look for a cause

Listen and learn
Help mother to talk about feelings (guilt, anger)
Empathize

Take a history
Learn about baby’s feeding and behaviour
Learn about mother’s diet, coffee, smoking, drugs
Pressures from family and others

Assess a breastfeed
Position at breast, length of feed

Examine baby
Illness or pain (treat or refer as appropriate)
Check growth

• Build confidence and give support

Accept
Mother’s ideas about the cause of the crying
Her feelings about baby and his behaviour

Praise
Her baby is growing well, not sick
Her breastmilk provides all that baby needs
Her baby is fine, not naughty or bad

(as appropriate)

Give relevant information
Baby has real need for comfort
Crying will decrease when baby is 3-4 months old
Medicines for colic not recommended
Complements not necessary or helpful
Artificially fed babies also have colic
Comfort suckling at breast is safe,
bottles and pacifiers not safe

Suggest
Give only one breast at each feed
Give other breast next feed
Reduce coffee and tea
Smoke after not before or during breastfeeds
Stop milk, eggs, soy, peanuts
(1-week trial, if mother’s diet adequate)

(as appropriate)

Practical help
Show mother and others how to hold and carry baby with
close contact, gentle movement,
gentle abdominal pressure
Offer to discuss situation with family
Ankyloglossia

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<td>Frequently causes feeding problems</td>
<td>30%</td>
<td>10%</td>
<td></td>
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<td>Recommend surgery?</td>
<td>53%</td>
<td>21%</td>
<td>69%</td>
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<td>Sometimes causes speech problems</td>
<td>60%</td>
<td>23%</td>
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<td>Recommend surgery?</td>
<td>74%</td>
<td>29%</td>
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<td>50%</td>
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<td>Sometimes causes social distress</td>
<td>67%</td>
<td>21%</td>
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<tr>
<td>Recommend surgery?</td>
<td>69%</td>
<td>19%</td>
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- AAP: no position statements or guidelines
- AA Otolaryngology: no position statements or guidelines
- Academy of Breastfeeding Medicine
  - All neonates should be assessed for tongue-tie
  - Conservative management may be sufficient
  - If frenotomy is deemed necessary, should be performed by trained physician
Best Evidence

- **Frenulotomy for Breastfeeding Infants With Ankyloglossia: Effect on Milk Removal and Sucking Mechanism as Imaged by Ultrasound** Geddes et al, *Pediatrics* 2008
  - 24 dyads, average infant age 33 days
  - Ultrasound milk transfer improved after frenotomy

- **Tongue-tie and frenotomy in infants with breastfeeding difficulties: achieving a balance.** Power, Murphy, *Arch Dis Child* 2015
  - Wide variation in prevalence 0.02-10.7%
  - Hazelbaker Assessment Tool for lingual frenulum function
  - 316 infants reviewed in 5 quality RCTs
  - No major complications of frenotomy – optimal timing of intervention 2-3 weeks
  - 50% of BF infants required no intervention
Ankyloglossia Actions

- Lactation consultants and providers should collaborate before suggesting tongue-tie to new mothers
- For severe cases, consider frenotomy during birth hospitalization
  - LC, provider, family agree with diagnosis
  - Evidence of dysfunction
- For unclear cases, create interim feeding plan and follow closely
  - Optimal timing is likely 4-7 days of life
- Recommend surgical intervention over laser techniques
- No evidence about “maxillary” or “posterior” tongue tie at this time
HOW HEALTH SERVICES CAN SUSTAIN BREASTFEEDING

- **Praise all mothers who are breastfeeding**
  Encourage them to continue, and to help other mothers.
  Remember to praise mothers who breastfeed through the second year.

- **Help mothers to breastfeed in the most healthy way**
  For example, to breastfeed exclusively for 4-6 months.
  Help them to improve practices which may cause problems.

- **Encourage mothers to come for help before they decide to start artificial feeds**
  For example, if they are worried about their breastmilk supply.
  Or if they have a breastfeeding difficulty or question.

- **Refer mothers to a breastfeeding support group if appropriate.**
  (See Session 8, ‘Health care practices’.)

- **Provide appropriate family planning advice for women who are breastfeeding**
  Encourage a mother not to start a new pregnancy until this child is 2 years old or more.

- **Remember to encourage breastfeeding when you see a mother for:**
  - her postnatal check (in the first week, and at 6 weeks);
  - family planning;
  - growth monitoring (especially poor weight gain of baby);
  - nutrition education;
  - immunization (including for measles at 9 months).
  At the 9 months visit, encourage her to continue breastfeeding the child, with complementary foods, for another 12-15 months or more.

- **Help mothers to continue breastfeeding in these difficult situations:**
  - because they have to return to work;
  - with twins or low-birth-weight babies;
  - with a disabled baby;
  - if a mother is ill or disabled.

- **Help mothers to breastfeed sick babies and young children**
  A mother can increase her breastfeeds to 12 or more per day.
  If her baby cannot suckle, help her to express her breastmilk to feed him (see Session 20, “Expressing breastmilk”).

- **Inform your colleagues about what you are trying to do**
  Make sure that health workers in other sectors understand about breastfeeding. Ask for their support, and offer to help them if they are caring for mothers and babies.
If US families breastfed exclusively to 6 months...
- 90% compliance would save
  - $13B annually
  - 911 preventable infant deaths

That’s one preventable death for every 4391 births.
GMH alone delivered over 5600 babies last year.
Resources

- Baby Friendly USA
- CDC.gov/breastfeeding
- CDC.gov/obesity
- Institute of Medicine
- Department of Health and Human Services
- Surgeon General’s Call to Action to Support Breastfeeding, 2011
- WIC Loving Support Campaign
- US Breastfeeding Committee
- Academy of Breastfeeding Medicine
- AAP, Section on Breastfeeding
- AAP Breastfeeding Residency Curriculum
- AAP/ACOG Breastfeeding Handbook for Physicians
- Institute for Healthcare Improvement
- US Task Force on Obesity Prevention, 2010
- Family-Centered Maternity Care. Phillips
- Wellstart International
- Breastfeedingtraining.org
- Langman’s Embryology
- Guyton & Hall’s Textbook of Medical Physiology
- Boron & Boulpaep’s Medical Physiology, 2nd ed.