

SORT: KEY RECOMMENDATIONS FOR PRACTICE

<i>Clinical recommendation</i>	<i>Evidence rating</i>	<i>References</i>
Physicians should recommend that pregnant patients and their partners attend a structured prenatal breastfeeding education program that teaches feeding techniques and aims to build maternal confidence.	B	2, 17, 22, 24
Unless contraindicated by a medical condition, mothers should have immediate skin-to-skin contact with their infants through the first feeding to increase the likelihood of breastfeeding success, and should be encouraged to room-in, feed on demand, and avoid supplements and pacifiers in their infants.	A	2, 3, 20-22
Hospital systems should be encouraged to adopt the Baby-Friendly Hospital Initiative.	B	17, 21, 22
Ensure close follow-up at three to five days and again at seven to 14 days after hospital discharge for breastfed babies.	C	2, 15, 23
Women with low milk supply should first undergo intensive evaluation by a certified lactation consultant for problems in breastfeeding technique; formula supplementation may be considered as a second-line option.	C	2
Breastfeeding babies should receive a daily dose of oral vitamin D drops (200 IU) beginning in the first two months of life and persisting until 500 mL of vitamin-D fortified formula or breast milk is consumed daily.	C	2, 28-33

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, see <http://www.aafp.org/afpsort.xml>.

Table 1. Benefits of Breastfeeding

Disease prevention

Decreased risk of asthma, Hodgkin's disease, hypercholesterolemia, leukemia, obesity, type 1 and 2 diabetes
 Decreased hospitalizations for lower respiratory illnesses and sudden infant death syndrome

Nutritional

Human milk is species-specific and superior to substitutes

Immunologic

Decrease in bacterial meningitis, bacteremia, diarrhea, late-onset sepsis, necrotizing enterocolitis, otitis media, respiratory tract infections, urinary tract infections

Developmental

Improved developmental outcomes in premature infants

Psychologic

Analgesic effects during painful procedures

Maternal health

Decrease in risk of breast and ovarian cancers, decreased postpartum bleeding, earlier return to prepregnancy weight, lactation amenorrhea

Economic

A decrease of \$3.6 billion in annual health care costs, decreased cost for public supplementation programs (e.g., Women, Infants, and Children program), and decreased patient costs

Environmental

Decreased disposal of formula cans and bottles

Information from reference 2.

states to achieve all three of the Healthy People 2010 objectives.¹¹ Consistent with previous research, this study also demonstrated that non-Hispanic black and socioeconomically disadvantaged groups have lower breastfeeding rates (Figure 2).¹⁴

Improving Initiation Success Rates

Most women decide by the beginning of the third trimester whether they will breast-feed.¹⁵ The single most effective intervention promoting breastfeeding initiation is an education program. A systematic review and meta-analysis found that one additional mother would initiate and continue breastfeeding for up to three months for every three to five women attending an educational program.¹⁶ The U.S. Preventive Services Task Force recommends structured breastfeeding education and behaviorally oriented counseling programs to increase breastfeeding initiation and maintenance.¹⁷ Therefore, persons who provide maternity care should encourage all patients and their partners to attend a breastfeeding education program that demonstrates the benefits of breast milk and its superiority to alternatives.

One study has shown that partner education resulted in an increase of breastfeeding ini-

tiation from 41 to 74 percent.¹⁸ A randomized controlled trial demonstrated that, with partner support, the prevalence of exclusive breastfeeding at six months was 25 percent compared with 15 percent in women who did not receive partner support.¹⁹ Breastfeeding education should begin as soon as antenatal visits commence.

Education in the immediate postpartum period is critical to facilitate breastfeeding success. A 2003 Cochrane review found that immediate skin-to-skin contact between mother and newborn improves breastfeeding outcomes.²⁰ Postpartum breastfeeding should occur within the first hour of life, even if weighing, bathing, or administering medications (e.g., eye prophylaxis, vitamin K) are delayed.^{2,3,20,21}

The Baby-Friendly Hospital Initiative (BFHI), an initiative of the WHO and the United Nations Children's Fund (UNICEF), recommends rooming-in (allowing mother and infant to remain together 24 hours a day), feeding on demand, and no artificial pacifiers or supplemental formula unless physician ordered.^{20,22} Hospital systems should be encouraged to adopt the BFHI.^{17,21,22} At institutions where BFHI recommendations are not used systemically, physicians should write orders specifying initiation of breastfeeding in the first hour of life, no supplementation, and no pacifier use. Twice daily formal evaluations of breastfeeding by available, skilled health care professionals also improve breastfeeding success rates.²¹

Postpartum Follow-up Visits

Twenty-five percent of women discontinue breastfeeding during the first week after delivery and 10 percent discontinue between weeks one and two. An additional 40 percent stop breastfeeding between two weeks and two months.¹⁵

Understanding the reasons for discontinuation is fundamental to increasing the duration of breastfeeding. A lack of maternal confidence causes early discontinuation of breastfeeding more often than lactation problems or a lack of knowledge.¹⁵ Earlier postpartum follow-up visits, at three to five days and at seven to 14 days, can provide an

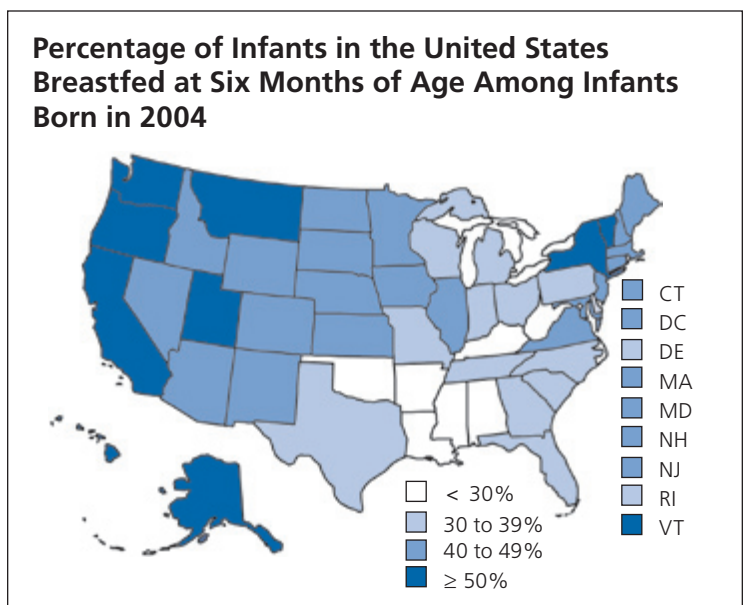


Figure 1. Map showing percentage of infants in the United States who are breastfed at six months of age by state among infants born in 2004.

Adapted from Centers for Disease Control and Prevention. Map 2. Percent of children breastfed at 6 months of age by state among children born in 2004. http://www.cdc.gov/breastfeeding/data/NIS_data/2004/map_2.htm. Accessed June 26, 2008.

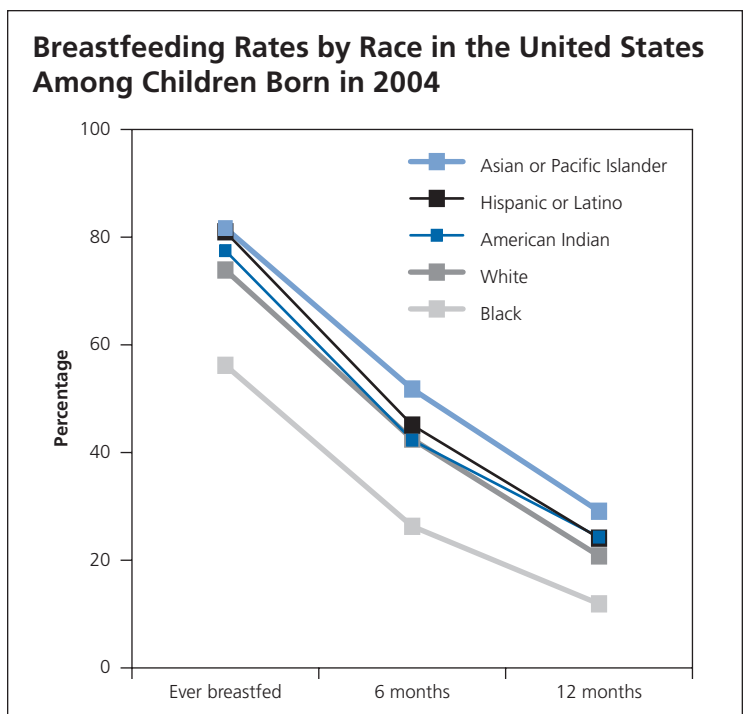


Figure 2. Graph showing breastfeeding rates by race in the United States among children born in 2004.

Information from reference 14.

opportunity for the physician to intervene and reinforce the importance of continued breastfeeding.^{2,15,23}

Nurse visits, including outpatient lactation consultant visits and telephone follow-ups, are helpful adjuncts to face-to-face physician contact. One randomized controlled trial in Mexico showed that women were more likely to breastfeed exclusively if they were supported with home visits; 64 percent of the women provided six visits were exclusively breastfeeding at three months versus 48 percent of women who were given three visits and 15 percent of those who did not receive this support.²⁴

Parental concerns about insufficient milk production merit further evaluation. If a work-up is required, parents should be supported in their decision to breastfeed. Physicians should confirm that the infant is fed no less than every three hours and approximately 10 to 12 times daily. Every feeding should allow 10 to 15 minutes on each breast.² Mothers should be asked about symptoms of breast engorgement and the sensation that their milk has come in, which generally occurs between 48 and 96 hours after delivery. The infant must be carefully assessed for jaundice, weight loss, and signs of failure to thrive. Percentage of birth weight lost should be calculated; a decrease in weight of more than 8 percent necessitates follow-up within 48 hours, and a bilirubin level should be drawn to assess for hyperbilirubinemia.

A loss of more than 10 percent of birth weight warrants careful assessment of other causes and consideration of admission to the hospital. In these infants, a certified lactation consultation may illuminate a cause.² In recalcitrant patients, physicians may recommend a temporary measure of supplementation with breast milk or infant formula if breast milk is not available. Occasionally, galactagogues (e.g., metoclopramide [Reglan], fenugreek) have been used to increase breast milk supply.²⁴ However, the evidence supporting their effectiveness is limited and they are associated with side effects in the mother and infant.²⁵

Nipple sensitivity for the first 30 seconds to one minute of breastfeeding initiation is nor-

mal during the first week. However, patients who continue to experience nipple or breast problems after the first week must be evaluated.²⁶ Reasons for breast pain include incorrect latch-on, cracked nipples, engorgement, and mastitis. The infant should grasp a large portion of the areola by latching on with a wide open mouth. Using breast milk and emollients to soften the nipple can reduce pain and dryness. Patients experiencing problems with engorgement or mastitis must be instructed in the importance of continued breastfeeding.²⁶ Nonsteroidal anti-inflammatory drugs, massage, moist heat, and mechanical expression of breast milk help alleviate the acute pain associated with engorgement. After expressing milk, cold compresses and anti-inflammatory medications can reduce pain and edema. Cooled cabbage leaves have also been traditionally recommended, but show no clear benefit over placebo.²⁷

Breast milk contains only small amounts of vitamin D.²⁸ Therefore, physicians must be aware of the risk of rickets in infants who are breastfed.^{2,29} Concerns about skin damage from sun exposure appropriately compel parents to apply sunscreen and minimize sunlight exposure, thereby restricting vitamin D creation in the skin.³⁰ Two recent case reports describe 34 modern cases of rickets, primarily in dark-skinned infants with minimal sun exposure.^{31,32} An observational study of 84 breastfed infants in Iowa demonstrated that 10 percent of breastfed infants had abnormally low vitamin D levels at 280 days of life. Vitamin D deficiency was more common in dark-skinned infants and during the winter months, when 78 percent of infants not given supplements were deficient.³³ The AAP recommends a daily dose of oral vitamin D drops (200 IU) beginning in the first two months of life and persisting until 500 mL of vitamin-D fortified formula or milk is consumed daily.^{2,29} No studies show adverse effects of vitamin D supplementation at this dose.

Breastfeeding and Work

Eighteen percent of women report their job schedule as the reason for discontinuing breastfeeding.²³ The Ross Mother's Trend

Table 2. Conditions That Are Not Contraindications to Breastfeeding

<i>Condition</i>	<i>Comments</i>
Breast augmentation (prior)	Consider antepartum lactation consultation
Fever or infection (including mastitis and endometritis)	Human immunodeficiency virus, active untreated tuberculosis, or active herpes lesions on the breast are contraindications
Hepatitis B or C carrier status	Infant should receive early vaccination, but breastfeeding is encouraged
Hyperbilirubinemia (in the infant)	Mother must be monitored for adequate milk supply; infant should be monitored for signs of kernicterus
Multiple gestations	Most women can produce enough milk to fully breastfeed twins; lactation consultation is often needed Women with higher-order multiple gestations may need to supplement with formula, but should be encouraged to breastfeed as much as possible
Preterm birth	Expression of milk using a pump may be required early on, but a transition to breastfeeding is usually possible
Reduction mammoplasty (prior)	Consider antepartum lactation consultation
Smoking	Encourage cessation of all smoking in the household, but breastfeeding is not contraindicated
Tongue-tied infants	May require lactation consultation

Information from references 2, 3, and 8.

Data (2003) showed that employed women have almost identical breastfeeding initiation rates as women who stay home (66.6 and 64.8 percent, respectively). At six months however, only 26.1 percent of women working full time are still breastfeeding compared with 35.0 percent of stay-at-home mothers.³⁴

Physicians, nurses, and office staff can provide support to employed women in the early postpartum period. Mothers should be encouraged to start pumping and storing breast milk after breastfeeding is established and before they return to work. Breast milk can be left at room temperature for about eight hours, refrigerated for up to seven days, or be stored in a refrigerator-freezer for three to four months or in a separate freezer chest for up to one year. After thawed and gradually warmed in a container of water, breast milk should be used within 24 hours and then discarded.³⁵ Breast milk should not be microwaved because uneven heating may denature essential proteins, detracting from the milk's beneficial health effects.³⁶

Contraindications to Breastfeeding

The AAP recommends that women who have transmittable infections, such as human immunodeficiency virus, active untreated tuberculosis, or active herpes lesions on the breast, should not breastfeed.² Additionally, mothers receiving diagnostic or therapeutic radioactive isotopes, antimetabolites, or chemotherapeutic agents, and mothers using illicit street drugs should not breastfeed during periods of exposure to these agents. Infants with homozygous galactosemia also should not be breastfed.^{1,2}

Women who have breast implants or who are status postreduction mammoplasty can often breastfeed. In addition, carriers for hepatitis B or C and women who have a fever or postpartum infection, such as mastitis or endometritis, can also breastfeed.^{1,2,37} Although not ideal, smoking while lactating is not a contraindication.¹ Tongue-tied infants³⁸ and those with mild to moderate hyperbilirubinemia can also be breastfed.³⁹ *Table 2* lists conditions that are not contraindications to breastfeeding.^{2,3,8}

Table 3. Safety of Medications in Mothers Who Are Breastfeeding

<i>Medication</i>	<i>Safety recommendation</i>	<i>Possible effect on infant</i>
Analgesics		
Acetaminophen, ibuprofen (Motrin), opioids	Safe in commonly prescribed doses	—
High-dose aspirin	Second-line option	Platelet dysfunction; one case of metabolic acidosis
Meperidine (Demerol); naproxen (Naprosyn)	Use with caution	Long half-life may lead to accumulation in infant
Antibiotics		
Aminoglycosides	Safe	—
Cephalosporins	Safe	—
Fluoroquinolones	American Academy of Pediatrics considers safe	Possible risk of arthropathy
Macrolides	Use with caution Concentrated in human milk	Erythromycin associated with increased incidence of pyloric stenosis
Metronidazole (Flagyl)	Pump and discard breast milk during use and 24 hours after last dose	In-vitro mutagen; no association with cancer seen in humans
Nitrofurantoin (Furadantin)	Use with caution	Hemolysis in infant with G6PD deficiency
Penicillins	Safe	—
Sulfa drugs	Avoid use in first month	Elevates infant bilirubin levels
Tetracycline	Avoid prolonged use (greater than three weeks)	Tooth staining
Antihypertensives		
Angiotensin-converting enzyme inhibitors	Safe after four to six weeks	Possible renal toxicity in premature infants
Beta blockers	—	—
Atenolol (Tenormin)	Do not use	Cyanosis, bradycardia
Other beta blockers	Use with caution	Bradycardia
Calcium channel blockers	Use with caution	—
Antidepressants		
Fluoxetine (Prozac)	Weigh risks versus benefits	May cause colic, irritability, feeding and sleep disorders, slow weight gain
Sertraline (Zoloft), paroxetine (Paxil)	Excreted in breast milk, but infant serum levels very low or undetectable	No reported effect
Combined oral contraceptives	Avoid until breastfeeding well-established (60 to 90 days); low dose preferred	May decrease milk supply

G6PD = glucose-6-phosphate dehydrogenase.

Information from references 40 through 43.

Breastfeeding and Medications

Most commonly prescribed postpartum medications are safe for breastfeeding women.⁴⁰ Although a complete discussion

of medication safety in lactation is beyond the scope of this article, *Table 3* provides an overview of the safety of medications most often used by lactating women.⁴⁰⁻⁴³

Multiple studies show that breastfeeding mothers do not adhere to prescribed medications, even when the drug is considered safe. It is important for physicians not only to discuss the safety of medication, but to reassure and support continued breastfeeding while taking medications.⁴¹

The opinions and assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the U.S. Air Force Medical Department or the U.S. Air Force at large.

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REFERENCES

1. U.S. Department of Health and Human Services, Office on Women's Health. Breastfeeding: HHS Blueprint for Action on Breastfeeding. Washington, DC: U.S. Department of Health and Human Services, Office on Women's Health; 2000.
2. Gartner LM, Morton J, Lawrence RA, et al. American Academy of Pediatrics Section on Breastfeeding. Breastfeeding and the use of human milk. *Pediatrics*. 2005;115(2):496-506.
3. American Academy of Family Physicians. Breastfeeding (position paper). <http://www.aafp.org/online/en/home/policy/policies/b/breastfeedingpositionpaper.html> Accessed January 28, 2008.
4. Kramer MS, Kakuma R. Optimal duration of exclusive breastfeeding. *Cochrane Database Syst Rev*. 2002;(1):CD003517.
5. Bachrach VR, Schwarz E, Bachrach LR. Breast feeding and the risk of hospitalization for respiratory disease in infancy: a meta-analysis. *Arch Pediatr Adolesc Med*. 2003;157(3):237-243.
6. Chen A, Rogan WJ. Breastfeeding and the risk of postneonatal death in the United States. *Pediatrics*. 2004;113(5):e435-9.
7. American Academy of Family Physicians. Breastfeeding (policy statement). <http://www.aafp.org/online/en/home/policy/policies/b/breastfeedingpolicy.html>. Accessed January 28, 2008.
8. Committee on Health Care for Underserved Women, American College of Obstetrics and Gynecologists. Breastfeeding: maternal and infant aspects. ACOG Committee Opinion No. 361. *Obstet Gynecol*. 2007;109(2 pt 1):479-480.
9. Agency for Healthcare Research and Quality. Breastfeeding, maternal & infant health outcomes in developed countries. Rockville, Md.: U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality; April 2007. <http://www.ahrq.gov/clinic/tp/brfouttp.htm>. Accessed January 29, 2008.
10. Healthy People 2010, U.S. Department of Health and Human Services. *Healthy People 2010*. 2nd ed. Washington, DC: U.S. Department of Health and Human Services; 2000:46-48.
11. Centers for Disease Control and Prevention. Breastfeeding practice—results from the National Immunization Survey. http://www.cdc.gov/breastfeeding/data/NIS_data/data_2004.htm. Accessed June 26, 2008.
12. World Health Organization. Infant and young child feeding and nutrition. <http://www.who.int/child-adolescent-health/NUTRITION/infant.htm>. Accessed August 8, 2007.
13. Centers for Disease Control and Prevention. Map 2. Percent of children breastfed at 6 months of age by state among children born in 2004. http://www.cdc.gov/breastfeeding/data/NIS_data/2004/map_2.htm. Accessed June 26, 2008.
14. Centers for Disease Control and Prevention. Breastfeeding rates by sociodemographic factors, among children born in 2004. http://www.cdc.gov/breastfeeding/data/NIS_data/2004/socio-demographic.htm. Accessed June 26, 2008.
15. Ertem IO, Votto N, Leventhal JM. The timing and predictors of the early termination of breastfeeding. *Pediatrics*. 2001;107(3):543-548.
16. Guise JM, Palda V, Westhoff C, Chan BK, Helfand M, Lieu TA, for the U.S. Preventive Services Task Force. The effectiveness of primary care-based interventions to promote breastfeeding: systematic evidence review and meta-analysis for the US Preventive Services Task Force. *Ann Fam Med*. 2003;1(2):70-78.
17. U.S. Preventive Services Task Force. Behavioral interventions to promote breastfeeding. <http://www.ahrq.gov/clinic/3rduspstf/brstfeed/brfeedrr.htm>. Accessed August 8, 2007.
18. Wolfberg AJ, Michels KB, Shields W, O'Campo P, Bronner Y, Bienstock J. Dads as breastfeeding advocates: results from a randomized controlled trial of an educational intervention. *Am J Obstet Gynecol*. 2004;191(3):708-712.

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19. Pisacane A, Constinisio GI, Aldinucci M, D Amora S, Constinisio P. A controlled trial of the father's role in breastfeeding promotion. *Pediatrics*. 2005;116(4):e494-e498.
20. Anderson GC, Moore E, Hepworth J, Bergman N. Early skin-to-skin contact for mothers and their healthy newborn infants. *Cochrane Database Syst Rev*. 2003;(2):CD003519.
21. Philipp BL, Merewood A. The Baby-Friendly way: the best breastfeeding start. *Pediatr Clin North Am*. 2004;51(3):761-783, xi.
22. World Health Organization. Evidence for the Ten Steps to Successful Breastfeeding. Geneva, Switzerland: World Health Organization; 1998. http://www.who.int/entity/nutrition/publications/evidence_ten_step_eng.pdf. Accessed February 20, 2008.
23. Taylor JS, Risica PM, Cabral HJ. Why primiparous mothers do not breastfeed in the United States: a national survey. *Acta Paediatr*. 2003;92(11):1308-1313.
24. Berens PD. Prenatal, intrapartum, and postpartum support of the lactating mother. *Pediatr Clin North Am*. 2001;48(2):365-375.
25. Gabay MP. Galactagogues: medications that induce lactation. *J Hum Lact*. 2002;18(3):274-279.
26. Morland-Schultz K, Hill PD. Prevention of and therapies for nipple pain: a systematic review. *J Obstet Gynecol Neonatal Nurs*. 2005;34(4):428-437.
27. Roberts KL, Reiter M, Schuster D. Effects of cabbage leaf extract on breast engorgement. *J Hum Lact*. 1998;14(3):231-236.
28. Reeve LE, Chesney RW, DeLuca HF. Vitamin D of human milk: identification of biologically active forms. *Am J Clin Nutr*. 1982;36(1):122-126.
29. Gartner LM, Greer FR, for the Section on Breastfeeding and Committee on Nutrition, American Academy of Pediatrics. Prevention of rickets and vitamin D deficiency: new guidelines for vitamin D intake. *Pediatrics*. 2003;111(4 pt 1):908-910.
30. American Academy of Pediatrics Committee on Environmental Health. Ultraviolet light: a hazard to children. *Pediatrics*. 1999;104(2 pt 1):328-333.
31. Kreiter SR, Schwartz RP, Kirkman HN Jr, Charlton PA, Calikoglu AS, Davenport ML. Nutritional rickets in African American breast-fed infants. *J Pediatr*. 2000;137(2):153-157.
32. Pugliese MT, Blumberg DL, Hludzinski J, Kay S. Nutritional rickets in suburbia. *J Am Coll Nutr*. 1998;17(6):637-641.
33. Ziegler EE, Hollis BW, Nelson SE, Jeter JM. Vitamin D deficiency in breastfed infants in Iowa. *Pediatrics*. 2006;118(2):603-610.
34. Ryan AS, Wenjun Z, Acosta A. Breastfeeding continues to increase into the new millennium. *Pediatrics*. 2002;110(6):1103-1109.
35. Larson E, Zuill R, Zier V, Berg B. Storage of human breast milk. *Infect Control*. 1984;(3):127-130.
36. Quan R, Yang C, Rubinstein S, et al. Effects of microwave radiation on anti-infective factors in human milk. *Pediatrics*. 1992;89(4 pt 1):667-669.
37. Wang JS, Zhu QR, Wang XH. Breastfeeding does not pose any additional risk of immunoprophylaxis failure on infants of HBV carrier mothers. *Int J Clin Pract*. 2003;57(2):100-102.
38. Ricke LA, Baker NJ, Madlon-Kay DJ, DeFor TA. Newborn tongue-tie: prevalence and effect on breast-feeding. *J Am Board Fam Pract*. 2005;18(1):1-7.
39. American Academy of Pediatrics Subcommittee on Hyperbilirubinemia. Management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation [published correction appears in *Pediatrics*. 2004;114(4):1138]. *Pediatrics*. 2004;114(1):297-316.
40. Hale TW. *Medications and Mother's Milk*. 12th ed. Amarillo, Tex.: Hale Publishing, L.P.; 2006
41. Della-Giustina K, Chow G. Medications in pregnancy and lactation. *Emerg Med Clin North Am*. 2003;21(3):585-613.
42. Whitby DH, Smith KM. The use of tricyclic antidepressants and selective serotonin reuptake inhibitors in women who are breastfeeding. *Pharmacotherapy*. 2005;25(3):411-425.
43. American Academy of Pediatrics Committee on Drugs. Transfer of drugs and other chemicals into human milk. *Pediatrics*. 2001;108(3):776-789.