About Wellstart International …

Wellstart International is a nonprofit organization with (501) (C) (3) tax deductible status. It was launched originally as the San Diego Lactation Program (SDLP) in 1979-1980. Initially the SDLP was within the Department of Community and Family Medicine of the University of California San Diego Medical School and was a component of the perinatal services and teaching of the University of California San Diego Medical Center. In 1983 with funding from the United States Agency for International Development (USAID) SDLP added an international faculty education and development program, The Lactation Management Education Program (LMEP). The program design included bringing multidisciplinary, leadership level teams of health care providers (OB, Pediatricians, Family Practitioners, Nurses, Nurse Midwives and Nutritionists) from teaching hospitals from several countries together for 3 weeks of lactation management education and skill development and 1 week of planning a program that they would undertake upon returning home. A follow-up visit was provided to their home site at the invitation of the team sometime after their program was underway. The conversion of the SDLP to an independent nonprofit organization, Wellstart International, and a move to a nearby but separate location occurred in 1985.

A primary objective of LMEP was to create a “cascade” of skilled and knowledgeable leaders in medical, nursing and nutrition education that could make needed changes in their curriculum as well as the services provided to mothers and babies that would promote successful breastfeeding. The program was considered quite successful and in the 15 years of continuation, 655 health care providers from 55 countries (including the United States) became Wellstart Associates. A follow-up study of 40 of these Associates undertaken at the request of UNICEF in 2003 suggested that the program through the cascade of training approach, had changed the care given to mother-baby pairs in hundreds of hospitals, modified curriculum in a significant number of professional training programs, contributed to hundreds of thousands of secondary training events and contributed to the global expertise regarding lactation management.

Since 1985, Wellstart, as an organization or through staff participation has also been very active and influential in many global events related to the protection, promotion and support of optimal infant and young child feeding. These include the development of the “Ten Steps”, Innocenti Declaration of 1990 and 2005, WABA and World Breastfeeding Week, The Baby Friendly Hospital Initiative, The United States Breastfeeding Committee and the development of the Academy of Breastfeeding Medicine. As will be further described in the foreword, Wellstart also has considerable experience in developing a number of useful teaching techniques and tools.

Also since the conversion of the SDLP to Wellstart International, the organization has maintained an office in California but has had additional offices in several places: Armenia, Washington DC, and Cairo, Egypt. At the present time administrative tasks are carried out in California and programmatic activities are planned and coordinated in Vermont.
About the Authors….

Audrey Naylor

Audrey Naylor is a board certified pediatrician with additional training in infant development, maternal and child health and epidemiology. In addition to receiving a degree in Medicine from the University of California Los Angeles School of Medicine, she also holds a DrPH in Epidemiology (with a major focus on perinatal care) from UCLA School of Public Health. She has a lifetime professional interest in maternal, infant, and family health promotion, preferring to prevent rather than treat disease.

In 1985, with Ruth Wester, she co-founded, Wellstart International, a nonprofit organization established to educate health care providers (medical and nursing students as well as perinatal specialty residents), in the “why and hows” of optimal infant and young child feeding. She has been instrumental in both international efforts as well as those focused primarily in the United States to promote breastfeeding as the normal way to feed infants and young children.

She is a founding member of the Academy of Feeding Medicine, the World Alliance of Breastfeeding Action, the United States Breastfeeding Committee and the Section on Breastfeeding of the American Academy of Pediatrics. She is also an experienced medical school educator and has been a member of several medical school faculties including Ohio State University College of Medicine, The University of Southern California School of Medicine, and The University of California San Diego School of Medicine. She is currently a Clinical Professor of Pediatrics (Voluntary, part-time) at the University of Vermont College of Medicine.

Ruth Wester

Ruth Wester is a registered nurse with extensive experience in both inpatient and outpatient pediatric nursing. She also was the Head Nurse of the Marion Davies Pediatric Clinic, a highly regarded teaching and service clinic at UCLA. While serving UCLA, she accepted an opportunity to train as a pediatric nurse practitioner (PNP) and subsequently served the clinic as both the Head Nurse as well as a PNP.

In 1978, she accepted a position as the normal newborn discharge nurse and Assistant Professor of Pediatrics at UCSD Medical Center in San Diego and began to instruct medical students and residents about breastfeeding and lactation management. With Dr. Naylor, she co-founded Wellstart International and has provided service to many thousands of breastfeeding families and taught lactation management to medical and nursing students as well as residents and faculty all over the world. She is an expert in the field of lactation management education.
We are guilty of many errors and faults, but our worst crime is abandoning the children, neglecting the foundation of life. Many of the things we need can wait. The child cannot. Right now is the time his bones are being formed, his blood is being made and his senses are being developed. To him we cannot answer ‘tomorrow’. His name is Today.

Gabriele Mistral
Dedication

This Third Edition of Wellstart International’s Lactation Management Self-Study Modules, Level 1 is dedicated to all of the mothers, fathers and families who are raising the next generation of the world’s citizens. Whether they live in urban or rural settings, developed or developing nation, are rich or poor, they deserve our respect and well prepared services and support at all times.
Acknowledgements


A First Edition is always the inspiration of all future editions. The creation and development of the First Edition of the Wellstart International Lactation Management Self-Study Modules, Level I in 2000 would not have been possible without the input and effort of a number of talented people. We would like to express our continuing gratitude to the following individuals who assisted with that document:

- Eyla Boies, MD, Clinical Associate Professor of Pediatrics, University of California, San Diego
- Elizabeth Creer, RN, FNP, MPH, Wellstart International faculty
- Pamela Deak, MD, Division of Obstetrics and Gynecology, University of California, San Diego
- Donata Eggers, BS, RD, Instructor, Department of Pediatrics, Southern Illinois University
- Stephanie Gabela, MPH, RD, Wellstart International faculty
- Helen Moose, MS, CNM, Instructor, Department of Family and Community Medicine, Southern Illinois University
- Victoria Nichols-Johnson, MD, Associate Professor, Division of General Obstetrics and Gynecology, Southern Illinois University
- Janine Schooley, MPH, Wellstart International, Project Manager
- Kirsten Searfus, MD, Assistant Professor, Division of Family Medicine, University of California, San Diego
- Kim Solis, Wellstart International Assistant Project Manager
- Yvonne Vaucher, MD, MPH, Clinical Professor of Pediatrics, Division of Neonatal/Perinatal Medicine

In addition, the medical students from Southern Illinois University and University of California, San Diego and nursing students at St. John’s College in Springfield, Illinois deserve thanks for their useful feedback.

Second Edition, 2005

As is usually the case, the Second Edition was developed on the basis of the content of the First Edition. Several members of the original team of talented people participated in creating the revisions for the second edition. We gratefully thank Yvonne Vaucher, MD, MPH, Clinical Professor of Pediatrics, Division of Neonatal/Perinatal Medicine, University of California, San Diego who encouraged and gave many hours to this effort as well as Kirsten Searfus, MD, Assistant Professor, Division of Family Medicine, University of California, San Diego for their support.

A special thanks also goes to Maria Elena Sandoval, Wellstart International Administrative Manager, for her skill, patience and extra effort in helping to prepare the second edition.

Finally, we would like thank Denise Sofka, RD, MPH of the US Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, for her continuing encouragement of Wellstart International and of the preparation of both the first and second editions of this teaching tool.

Audrey J. Naylor, MD, DrPH, F.A.A.P., F.A.B.M.  Ruth A. Wester, BA, RN, PNP
President and CEO  Vice-President
Wellstart International  Wellstart International
Clinical Professor (non-salaried), Pediatrics and Family Medicine
University of California San Diego School of Medicine
San Diego, California 2005
In planning for this Third Edition of Wellstart’s Self-Study Modules, Level I, it was important to assure that the information was not only current but that it could be used internationally. Thus this edition has also been carefully reviewed for final suggestions, corrections and international relevance by an outstanding team of 30 volunteer reviewers and contributors from all over the world. The following list includes these colleagues who have significant teaching experience in medical, nursing and pharmacy schools and residency training programs as well as providing service to breastfeeding mothers and babies around the world. Many are Wellstart Associates (*) or faculty members who taught in Wellstart International’s Lactation Management Education Faculty Development Program (**).

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These colleagues have done an outstanding job of helping to assure that this tool is current, and international in scope. They have our most sincere and heartfelt thanks.

Finally, once again, thanks goes to Maria Elena Sandoval for helping to prepare this Third Edition of Wellstart's Lactation Management Self-Study Modules, Level I.

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President and CEO
Wellstart International
Clinical Professor of Pediatrics (vol part-time)
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Shelburne, Vermont
April 2009
Foreword

In a series of articles published in Lancet in 2003 it is noted that some 13% of the 9.5 million annual deaths in the world among children under 5 years can be prevented or significantly decreased in severity by breastfeeding exclusively for six months and then adding appropriate nutritious complimentary foods. The majority of these deaths occurred in the less economically developed nations of the world. In addition, breastfeeding is now well accepted as a very effective evidenced based primary health care strategy in developed nations for improving both the immediate health and well being of mothers, infants and children as well as lowering the risk of a significant number of chronic diseases of older children and adults. Thus when breastfeeding, a biologically normal reproductive process and way to feed human infants and young children, is supported as a basic component of optimal infant and young child feeding (OYCF, Figure 1) individual, family and community health can be significantly improved globally.

There are, of course, many influences on achieving OYCF. Among these are health care providers with knowledge and skill of lactation management and breastfeeding support. Unfortunately many health care providers have only a limited knowledge of this topic. An important reason for this lack of knowledge is that many schools of medicine and nursing as well as nutrition programs have not included lactation management education in their curricula.

Lactation Management Curriculum

In 1985, to assist in meeting this need for curriculum content in lactation management, Wellstart International began providing education and training in lactation management and
breastfeeding promotion for both students and faculty of the health professions. In 1999, with funding from The United States Maternal Child Health Bureau of the Health Resources and Services Administration and in collaboration with the University of California San Diego Medical School, Wellstart developed the **Lactation Management Curriculum: A Faculty Guide for Schools of Medicine, Nursing and Nutrition (LMCG)**, now in its fourth edition.

The LMCG was developed to facilitate the integration of lactation management knowledge and skills into the curriculum of medicine, nursing and nutrition programs. It is a competency based tool and provides guidance in curriculum assessment, content suggestions and resources for three levels of professional responsibility. **Level I** provides basic knowledge needed by all health care providers to be supportive of normal mothers and their healthy full term infants. **Level II** includes more clinical detail for complex situations and is targeted at those who practice one of the perinatal specialties (pediatrics, obstetrics, family medicine, neonatology, etc). **Level III** is designed for those who will specialize in breastfeeding medicine and will serve as key faculty in leadership positions.(Figure 2)

<table>
<thead>
<tr>
<th>Content Focus of Modules</th>
<th>Level I: Basic Knowledge Needed by All Health Care Providers</th>
<th>Level II: Perinatal Care, Providers</th>
<th>Level III: Breastfeeding Medicine Specialists and Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1: Scientific Basis</td>
<td></td>
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<tr>
<td>Module 2: Clinical Management</td>
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<tr>
<td>Module 3: Professional Practice</td>
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</tbody>
</table>

**Figure 2. Lactation Management Curriculum - Schematic Diagram**
Level I

All health professionals regardless of whether or not they specifically provide care for breastfeeding mothers and infants should attain Level I knowledge and skills during their initial preparatory (preservice) program. Before entering the practice of their profession, they should have an understanding about the scientific basis for encouraging and supporting breastfeeding, the physiology and basics of clinical management of lactation for normal mothers and newborns and the societal influences on lactation and breastfeeding promotion. They should be able to provide health care that supports breastfeeding initiation and maintenance, and avoids creating barriers. While they need to be aware of the principles of lactation management, they do not necessarily need to attain clinical expertise in the area.

Lactation Management Self-Study Modules, Level I

Though the LMCG achieved considerable success, limitations of available time in a preservice health provider curriculum led to a recommendation by early users that a level I tool be developed that could be completed in a few hours and at a time and place of the student’s choosing. With further support from The Maternal Child Health Bureau of the Health Resources and Services Administration, a set of three clinically oriented, competency based, self-study modules was developed to help students achieve Level I knowledge. Initially published in 2000, the Lactation Management Self-Study Modules, Level I have been revised and updated twice (2005 and 2009) to incorporate important new evidenced based knowledge and skills.

These modules are particularly focused on the breastfeeding component of optimal infant and young child feeding. Scientific evidence for recommending breastfeeding, a review the physiology and basic management strategies to support lactation and breastfeeding and solutions to common problems are included. They provide a self-contained unit of basic knowledge that can be utilized by faculty, students, and other health care professionals in a variety of settings. They can be assigned during clinical rotations in pediatrics, family medicine, nutrition, obstetrics, and community health or as an elective course. Each institution can decide where the modules would have the most impact in their curriculum. They can also be used by those already in practice whose professional training did not include these topics or wish to have a review of the basics.

For this Third Edition, an annex has been added which provides a number of useful reference documents. These include an updated summary of key clinical points from the Modules called Highlights, WHO’s 2009 Acceptable Medical Reasons for Use of Breastmilk Substitutes, Infant feeding in Emergencies, Ten key points of The International Code of Marketing of Breastmilk Substitutes and Relevant World Health Assembly Resolutions, How to Store Human Milk (Protocol #8 from The Academy of Breastfeeding Medicine), Guidelines for Hand Expression and Websites of Interest.

As was said in the opening paragraph of this Foreword to the Third Edition of the Self-Study Modules, establishing breastfeeding as a biologically normal reproductive process and way to feed human infants and young children will have a major impact on improving individual, family and community health globally. Knowledgeable health care providers are fundamental to achieving this goal and preservice education is the foundation to this knowledge. In order to encourage this “revolution” in preservice education, Wellstart International has made a decision...
to provide this Third Edition on its web site as a downloadable teaching/learning tool without charge. We only ask that users take this opportunity seriously: read the material carefully and assume responsibility for providing the evidence based care that is explained and recommended. Become part of the solution that will help of children and their families survive and live life to the fullest.

References


Faculty Guide
Lactation Management Self-Study Modules, Level I
Faculty Guide

These Level I Modules are designed to be used during the beginning of clinical assignments or by those who have not had previous exposure to Level I content. They have also been useful as a review of the basics. They can be used as the entire content of a course or as a part of a course. For example, this material may be assigned as part of required clinical experiences in newborn and/or maternal care or as part of an elective or independent study. The manner in which these tools are used is up to the responsible faculty. Faculty are also encouraged to incorporate local or regional concerns into the experience of the participants. For example, in some areas of the world, HIV and AIDS are a major concern and may warrant more detailed special attention. Or perhaps the most commonly used human milk substitute is cow milk rather than a commercial formula requiring appropriate information and comparisons.

Regardless of whether they are used as a course or are part of a course, the Modules can be studied by the users at a time and place most convenient for the user. Though faculty involvement is not required, experience with the first and second editions suggests that users are likely to gain greater knowledge when guided by an interested faculty member. Experience has also indicated that medical students and residents are most responsive when the responsible faculty member and role model is a physician. For nursing students, a faculty member from the school of nursing is most effective.

While the modules can be done independent of one another, they are best reviewed in sequence. Thus a student may have time to complete Module 1 and later undertake Module 2 and even later, Module 3. A test of knowledge is included in the tool as well as answers that are briefly explained. Many faculty have found it useful to have students take the test as a pre-test and then a post test for comparison with the pre test scores. In addition, each module has a set of references that can be utilized for selecting assigned readings if so desired by responsible faculty.

The format of the modules provides application of the material by means of short case exercises. The information in the modules and the case exercises will be enhanced by a structured clinical experience such as bedside rounds where students can apply their new knowledge to a realistic setting. A clinical instructor, experienced in lactation management, should help the student carry out the breastfeeding assessment and problem solving steps.

Experience with the first and second edition has indicated that the three modules can be completed within a 6 to 7 hour time frame including reviews of two or three short DVDs or videos. Additional time will be required for the clinical experiences, essential to enhance application of the knowledge to real mother/infant situations.
Faculty Preparation

Faculty members who will direct or coordinate this self-study learning experience need to work through the modules to become familiar with the content, exercises, and accompanying materials. Ideally responsible faculty who plan to use this tool should be prepared at Level II or III. If faculty do not feel adequately prepared, enrollment is recommended in one of the workshops frequently provided by several organizations including the Academy of Breastfeeding Medicine (ABM), American Academy of Pediatrics (AAP), La Leche League’s Physician’s Seminar or other faculty development workshops. For those who will be working with students who intend to pursue certification by the International Board of Lactation Consultant Examiners, the workshops carried out by International Lactation Consultant Association (ILCA) workshops would be helpful. These workshop opportunities are announced by the sponsors on their organizational websites provided in annex G.

If enrollment in such workshops is not possible, the course, *Increasing Breastfeeding Success: Why It Matters and What the Research Shows* prepared by the Physician Lactation Education Collaborative of Washington State provides much Level 2 information and is made available at minimal cost. Information about obtaining this material can be obtained at: [www.withinreachwa.org](http://www.withinreachwa.org). Recently the AAP made their Residency Curriculum available on their web site ([www.AAP.org/breastfeeding](http://www.AAP.org/breastfeeding)). Much of this material is available without charge, though some recommended items (such as training videos/DVDs) can be obtained for a fee from other sources. This would also help prepare faculty at Level II. Though neither the Washington State Physician’s Collaborative nor the AAP Residency Curriculum material is intended to be a self-study course, both offer information and tools that can be helpful to someone who is already reasonably knowledgeable.

Teaching Resources

1. **Textbooks**

   It is also recommended that faculty assigned to direct or coordinate an experience using the Wellstart Self-Study Modules, have the following references available. The first three texts are particularly intended for physicians. The reference by Jan Riordan is also very often used in physician training but especially useful in programs focused on nursing students.


2. References

At the end of each of the three modules a list of relevant references for the content of the particular module is provided. These have also been put together as an alphabetized list in the annex included at the end of this tool.

WHO has recently developed and made available a “Model Chapter on Infant and Young Child Feeding” for textbooks for medical students and allied health professionals. This material is intended for perinatal health professionals. The chapter can be reviewed and downloaded without charge at the following website:


3. DVDS

Having an opportunity to visualize some of the techniques and skills described in Modules 2 and 3 of this Level I Self-Study tool can be particularly helpful to user of this tool. Several short DVDs regarding immediate breastfeeding at birth and how to assist a new mother-baby couple with achieving an effective, comfortable attachment or latch-on are available. Medical and nursing schools frequently maintain a library of teaching tools and may already have something appropriate in their collections. If that is not the case, faculty responsible for directing a program in which the Self Study Modules will be utilized are urged to consider reviewing and possibly obtaining one or two of the several relevant DVDs that are currently available. Titles and web sites where further information may be obtained include:

a. *Initiation of Breastfeeding by Breast Crawl*
   i. http://breastcrawl.org/video.htm

b. *Delivery Self Attachment with Dr. Lennart Righard*
   i. www.geddesproduction.com/breast-feeding-delivery-selfattachment.php

c. *Baby-Led Breastfeeding: The Mother Baby Dance with Christina M. Smiley, MD*
   i. www.geddesproduction.com/breast-feeding-baby-led.php

d. *Making Enough Milk, the Key to Successful Breastfeeding: Planning for Day One with Jane Morton, MD*
   i. www.breastmilksolutions.com/making_enough.html

e. *Latch 1,2,3: Troubleshooting Breastfeeding in the Early weeks*
   www.healthychildren.cc (note: from the menu on the left select “Breastfeeding Information Links” to find information regarding this DVD)
Annexes

A. Highlights from Lactation Management Self-Study Modules, Level I

B. Acceptable Medical Reasons for Use of Breastmilk Substitutes, World Health Organization/UNICEF 2009

C. Infant Feeding in Emergency Situations


E. ABM Protocol # 8: The Human Milk Storage information for Home Use for Healthy Full- term Infants

F. Wellstart International’s Guidelines for Hand Expression
A. Lactation Management Self-Study Modules: Highlights

This material provides a summary of some of the important clinical points contained in the Self-Study Modules. For those who like to have clinical reminders in their handheld electronic device or pocket notebook, the format allows these summaries to be easily transferred or clipped and inserted into a small notebook.
Recommendations for Adequate Breastmilk Intake:

Breastfeeding at least 8 times in 24 hours

Indicator of Adequate Intake (early weeks):

- Bowel movements: 3-4 or more every 24 hrs.
- Urination: 6 or more times every 24 hrs.
- Baby is content between feedings
- Average weight gain: 5-7 ounces/week (100 - 200 gms per week)

Signs of Effective Milk Removal:

- Sounds of baby swallowing during a feed
- Breasts full before feeding, softer afterward (early weeks)
  “Let-down sensation” or milk dripping

Questions for the Breastfeeding Mother

Why did you decide to breastfeed your baby?

What information about breastfeeding do you already have?

Are family members supportive of your interest in breastfeeding?

Will someone be at home to help you in the early weeks?

Do you have any special medical problems that require treatment or medications? Have you ever had breast surgery? If so for what problem?

How long do you plan to breastfeed?

Do you plan to return to work/school?

(If has breastfed other children before) How long did you breastfeed before? Why did you stop at that time? Did you have any problems?

Why Do Mothers Stop Breastfeeding?

<table>
<thead>
<tr>
<th>Time and Reason</th>
<th>Counseling Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>First 2 weeks:</td>
<td>Attachment assessment and help</td>
</tr>
<tr>
<td>Problems such as sore nipples</td>
<td>Where to go for help Support groups</td>
</tr>
<tr>
<td>Lack of Support</td>
<td>The milk supply has adjusted to baby’s needs</td>
</tr>
<tr>
<td>At 3-4 weeks:</td>
<td>More frequent feeding will increase the milk supply and satisfy the baby until the next spurt</td>
</tr>
<tr>
<td>Mother’s breasts no longer feel firm between feedings</td>
<td>Strategies to continue breast feeding:</td>
</tr>
<tr>
<td>“Appetite spurt” or “growth spurt”</td>
<td>Express &amp; store breast milk, feed during breaks at nearby childcare facility, take baby to work</td>
</tr>
<tr>
<td>Return to work or school</td>
<td>Gentle motion of baby’s tongue over the lower gum are unchanged when teeth have erupted</td>
</tr>
<tr>
<td>Belief that breastfeeding and work/school are not compatible</td>
<td></td>
</tr>
<tr>
<td>At 5-7 months</td>
<td>Breast milk continues to provide nourishment and protection from infection</td>
</tr>
<tr>
<td>Eruption of teeth</td>
<td></td>
</tr>
<tr>
<td>6 months</td>
<td>Introduction of solids</td>
</tr>
</tbody>
</table>

Summary of Differences Between Human Milk and Commercial Substitutes Marketed for Normal Term Infants

<table>
<thead>
<tr>
<th></th>
<th>Human milk</th>
<th>Commercial Substitutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>Correct quality/quantity, easier to digest</td>
<td>Partly corrected</td>
</tr>
<tr>
<td>Fat</td>
<td>Appropriate quality/quantity of essential fatty acids, lipase present</td>
<td>Lipase absent</td>
</tr>
<tr>
<td>Vitamins</td>
<td>Adequate except for vitamins D and K</td>
<td>Vitamins added</td>
</tr>
<tr>
<td>Minerals</td>
<td>Correct amount</td>
<td>Partly corrected</td>
</tr>
<tr>
<td>Anti-infective properties</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Growth factors</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Digestive enzymes</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Hormones</td>
<td>Present</td>
<td>Absent</td>
</tr>
</tbody>
</table>
Acceptable Medical Reasons for Supplementation*

- Inborn errors of metabolism, i.e., galactosemia, phenylketonuria, maple syrup urine disease. (rare)
- Very low birth weight (< 1500 g) and infants born before 32 weeks gestational age
- Infants at risk for potentially severe hypoglycemia. (small for gestational age, preterm, intra-partum stress, diabetic mothers) and blood sugar does not respond to breastfeeding or breastmilk feeding.
- Mothers who are infected with HIV (if replacement feeding is acceptable, feasible, affordable, sustainable and safe.
- Mother who is severely ill postpartum to pump, i.e., psychosis, eclampsia, unresponsive or shock.
- Mothers taking medications contraindicated when breastfeeding (rare).

When supplementing, mother’s milk supply should be maintained in most cases.

*note: these medical reasons for supplementation are consistent with the 2009 approved WHO recommendations.

Ten Steps to Successful Breastfeeding

Every facility providing maternity services and care for newborn infants should:

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within a half-hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breast milk, unless medically indicated.
7. Practice rooming-in (allow mothers and infants to remain together) 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial nipples or pacifiers to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

Common Breastfeeding Problems

Breastfeeding problems are usually easily prevented and treated. For the problems listed here, the continuation of breastfeeding is not only safe, but can help remedy the problem.

**Engorgement**

Common cause:
- Insufficient frequency of breastfeeds
- Insufficient emptying of the breast
- Poor positioning or poor attachment to the breast

Treatment:
- Express breastmilk by hand, or pump, before feeds to soften the areola
- Breastfeed more frequently and/or for longer periods
- Improve infant positioning and attachment
- Use moist heat and gentle massage before feeding; cool packs after.

**Cracked/Sore Nipples**

Common cause:
- Poor positioning and attachment of infant on the breast
- Inappropriate sucking technique
- Candidiasis mother and baby

Treatment:
- Assist with positioning and attachment
- Continue breastfeeding
- Treat both mother and baby for Candidiasis

**Mastitis**

Common cause:
- Nipple abrasions
- Milk stasis

Treatment:
- Treat nipple abrasions and assure effective suckling.
- Nurse more frequently (mastitis is an infection of the breast, not the milk).
- Apply moist heat for several minutes before each feeding
- Relieve inflammation, pain and fever.
- Take appropriate antibiotics as prescribed for 10 to 14 days.
- Rest as much as possible for at least 24 hours.
- Drink more fluids to meet thirst needs.

**“Not enough Milk”**

Common cause:
- Ineffective and/or infrequent suckling

Treatment:
- Check for effective suckling position
- Increase feeding frequency, and feed both day and night
- Apply moist heat before feeding
- Gentle stimulation of nipple and areola
- Massage breasts before and during feeding
- Reassurance

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B. Acceptable Medical Reasons for Use of Breast-Milk Substitutes, World Health Organization and UNICEF 2009

The teaching materials and assessment criteria of the WHO/UNICEF The Baby Friendly Hospital Initiative, begun in 1992, have recently been updated to incorporate the most recent research. Among the documents relevant to the concerns of users of the Level I Self-Study Modules are the revised criteria for the appropriate use of breastmilk substitutes. The following material includes the 2009 approved WHO/UNICEF statement regarding this matter.
Acceptable medical reasons for use of breast-milk substitutes
Preface

A list of acceptable medical reasons for supplementation was originally developed by WHO and UNICEF as an annex to the Baby-friendly Hospital Initiative (BFHI) package of tools in 1992.

WHO and UNICEF agreed to update the list of medical reasons given that new scientific evidence had emerged since 1992, and that the BFHI package of tools was also being updated. The process was led by the departments of Nutrition for Health and Development (NHD) and Child and Adolescent Health and Development (CAH). In 2005, an updated draft list was shared with reviewers of the BFHI materials, and in September 2007 WHO invited a group of experts from a variety of fields and all WHO Regions to participate in a virtual network to review the draft list. The draft list was shared with all the experts who agreed to participate. Subsequent drafts were prepared based on three inter-related processes: a) several rounds of comments made by experts; b) a compilation of current and relevant WHO technical reviews and guidelines (see list of references); and c) comments from other WHO departments (Making Pregnancy Safer, Mental Health and Substance Abuse, and Essential Medicines) in general and for specific issues or queries raised by experts.

Technical reviews or guidelines were not available from WHO for a limited number of topics. In those cases, evidence was identified in consultation with the corresponding WHO department or the external experts in the specific area. In particular, the following additional evidence sources were used:
- The Drugs and Lactation Database (LactMed) hosted by the United States National Library of Medicine, which is a peer-reviewed and fully referenced database of drugs to which breastfeeding mothers may be exposed.
- The National Clinical Guidelines for the management of drug use during pregnancy, birth and the early development years of the newborn, review done by the New South Wales Department of Health, Australia, 2006.

The resulting final list was shared with external and internal reviewers for their agreement and is presented in this document.

The list of acceptable medical reasons for temporary or long-term use of breast-milk substitutes is made available both as an independent tool for health professionals working with mothers and newborn infants, and as part of the BFHI package. It is expected to be updated by 2012.

Acknowledgments

This list was developed by the WHO Departments of Nutrition for Health and Development and Child and Adolescent Health and Development, in close collaboration with UNICEF and the WHO Departments of Making Pregnancy Safer, Essential Medicines and Mental Health and Substance Abuse. The following experts provided key contributions for the updated list: Philip Anderson, Colin Binns, Riccardo Davanzo, Ros Escott, Carol Kolar, Ruth Lawrence, Lida Lhotska, Audrey Naylor, Jairo Osorno, Marina Rea, Felicity Savage, María Asunción Silvestre, Tereza Toma, Fernando Vallone, Nancy Wight, Antony Williams and Elizabeta Zisovska. They completed a declaration of interest and none identified a conflicting interest.
Introduction

Almost all mothers can breastfeed successfully, which includes initiating breastfeeding within the first hour of life, breastfeeding exclusively for the first 6 months and continuing breastfeeding (along with giving appropriate complementary foods) up to 2 years of age or beyond.

Exclusive breastfeeding in the first six months of life is particularly beneficial for mothers and infants.

Positive effects of breastfeeding on the health of infants and mothers are observed in all settings. Breastfeeding reduces the risk of acute infections such as diarrhoea, pneumonia, ear infection, *Haemophilus influenza*, meningitis and urinary tract infection (1). It also protects against chronic conditions in the future such as type 1 diabetes, ulcerative colitis, and Crohn’s disease. Breastfeeding during infancy is associated with lower mean blood pressure and total serum cholesterol, and with lower prevalence of type-2 diabetes, overweight and obesity during adolescence and adult life (2). Breastfeeding delays the return of a woman’s fertility and reduces the risks of post-partum haemorrhage, pre-menopausal breast cancer and ovarian cancer (3).

Nevertheless, a small number of health conditions of the infant or the mother may justify recommending that she does not breastfeed temporarily or permanently (4). These conditions, which concern very few mothers and their infants, are listed below together with some health conditions of the mother that, although serious, are not medical reasons for using breast-milk substitutes.

Whenever stopping breastfeeding is considered, the benefits of breastfeeding should be weighed against the risks posed by the presence of the specific conditions listed.

INFANT CONDITIONS

*Infants who should not receive breast milk or any other milk except specialized formula*

- classic galactosemia: a special galactose-free formula is needed;
- maple syrup urine disease: a special formula free of leucine, isoleucine and valine is needed;
- phenylketonuria: a special phenylalanine-free formula is needed (some breastfeeding is possible, under careful monitoring).

*Infants for whom breast milk remains the best feeding option but who may need other food in addition to breast milk for a limited period*

- very low birth weight infants (those born weighing less than 1500g);
- very preterm infants, i.e. those born less than 32 weeks gestational age;
- newborn infants who are at risk of hypoglycaemia by virtue of impaired metabolic adaptation or increased glucose demand (such as those who are preterm, small for gestational age or who have experienced significant intrapartum hypoxic/ischaemic stress, those who are ill and those whose mothers are diabetic (5) if their blood sugar fails to respond to optimal breastfeeding or breast-milk feeding.
MATERNAL CONDITIONS

Mothers who are affected by any of the conditions mentioned below should receive treatment according to standard guidelines.

Mothers who may need to avoid breastfeeding
- HIV infection\(^1\): if replacement feeding is acceptable, feasible, affordable, sustainable and safe (AFASS) (6).

Mothers who may need to avoid breastfeeding temporarily
- Severe illness that prevents a mother from caring for her infant, for example sepsis;
- Herpes simplex virus type 1 (HSV-1): direct contact between lesions on the mother's breasts and the infant's mouth should be avoided until all active lesions have resolved;
- Maternal medication:
  - sedating psychotherapeutic drugs, anti-epileptic drugs and opioids and their combinations may cause side effects such as drowsiness and respiratory depression and are better avoided if a safer alternative is available (7);
  - radioactive iodine-131 is better avoided given that safer alternatives are available - a mother can resume breastfeeding about two months after receiving this substance;
  - excessive use of topical iodine or iodophors (e.g., povidone-iodine), especially on open wounds or mucous membranes, can result in thyroid suppression or electrolyte abnormalities in the breastfed infant and should be avoided;
  - cytotoxic chemotherapy requires that a mother stops breastfeeding during therapy.

Mothers who can continue breastfeeding, although health problems may be of concern
- Breast abscess: breastfeeding should continue on the unaffected breast; feeding from the affected breast can resume once treatment has started (8).
- Hepatitis B: infants should be given hepatitis B vaccine, within the first 48 hours or as soon as possible thereafter (9).
- Hepatitis C.
- Mastitis: if breastfeeding is very painful, milk must be removed by expression to prevent progression of the condition(8).
- Tuberculosis: mother and baby should be managed according to national tuberculosis guidelines (10).
- Substance use\(^2\) (11):
  - maternal use of nicotine, alcohol, ecstasy, amphetamines, cocaine and related stimulants has been demonstrated to have harmful effects on breastfed babies;
  - alcohol, opioids, benzodiazepines and cannabis can cause sedation in both the mother and the baby.
  - Mothers should be encouraged not to use these substances and given opportunities and support to abstain.

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\(^1\) The most appropriate infant feeding option for an HIV-infected mother depends on her and her infant’s individual circumstances, including her health status, but should take consideration of the health services available and the counselling and support she is likely to receive. When replacement feeding is acceptable, feasible, affordable, sustainable and safe (AFASS), avoidance of all breastfeeding by HIV-infected women is recommended. Mixed feeding in the first 6 months of life (that is, breastfeeding while also giving other fluids, formula or foods) should always be avoided by HIV-infected mothers.

\(^2\) Mothers who choose not to cease their use of these substances or who are unable to do so should seek individual advice on the risks and benefits of breastfeeding depending on their individual circumstances. For mothers who use these substances in short episodes, consideration may be given to avoiding breastfeeding temporarily during this time.
References


Further information on maternal medication and breastfeeding is available at the following United States National Library of Medicine (NLM) website: http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?LACT

For further information, please contact:

Department of Child and Adolescent Health and Development
Email: cah@who.int
Web: www.who.int/child_adolescent_health

Department of Nutrition for Health and Development
Email: nutrition@who.int
Web: www.who.int/nutrition

Address: 20 Avenue Appia, 1211 Geneva 27, Switzerland
c. Infant Feeding in Emergency Situations: Guidelines from Wellstart International

Since the first edition of these Self-Study modules, several devastating international emergency situations have occurred: the Tsunami in northern Indonesia, hurricane Katrina in Louisiana and the surrounding region in the United States, the fires in California and earthquakes in China. For many reasons, breastfeeding is the best infant feeding method under such conditions. Breastmilk provides essential nutrients and fluids, prevents GI and respiratory infections common under emergency conditions, provides babies with a sense of security and is stress reducing for both mothers and babies. Anyone, at any time, may be involved in or called upon to respond to emergency situations. Thus all health care providers regardless of their area of professional practice, need to understand the importance of breastfeeding and assist in supporting and sustaining this essential modality. These brief Wellstart Guidelines include six most important concepts as well as a triage tool from the Emergency Nutrition Network. Further details are available from their website:
http://www.ennonline.net/ife.
Infant and Young Child Feeding in Emergency Situations

Infants and young children are particularly vulnerable to serious illness in emergency situations and feeding must be carefully done. Because of the increased risk of diarrheal diseases and other infections, supporting the continuation of breastfeeding is particularly important. In addition, the security and warmth provided by breastfeeding is crucial for both mothers and children in chaotic circumstances of an emergency. The risks associated with bottle and formula feeding are dramatically increased due to poor hygiene, crowding and limited water and fuel. The role of breastfeeding is even more important in emergency situations where it may be the only sustainable element of food security for infants and young children. Exclusive and prolonged breastfeeding is often the only form of family planning available to women in emergency situations. Last but not least, women need validation of their own competence, BF is one of their important traditional roles that can be sustained during a stressful situation.

Misconceptions about breastfeeding in emergencies

1. Women under stress cannot breastfeed
2. Malnourished women don't produce enough milk
3. Weaning cannot be reversed
4. General promotion of BF is enough
5. Human milk substitutes (infant formula and/or milk) are a necessary response to an emergency

1. **Women under stress CAN successfully breastfeed**
Milk release (letdown) is affected by stress. Milk production is NOT. Different hormones control these two processes. The treatment for poor milk release is increased suckling which increases the release of oxytocin, the *letdown* hormone. Research suggests that lactating women have a lower response to stress, so helping women to initiate or continue to BF may help them relieve stress.

2. **Malanourished women DO produce enough milk**
It is extremely important to distinguish between true cases of insufficient milk production (rare) and perceptions. Milk production is relatively unaffected in quantity and quality except in extremely malnourished women (only 1% of women). When women are malnourished it is the mother who suffers, not the
The solution to helping malnourished women and infants is to **feed the mother not the infant**. The mother will be less harmed by pathogens and she obviously needs more food. By feeding her, you are helping both the mother and child and harming neither. Remember that giving supplements to infants can decrease milk production by decreasing suckling. The treatment for true milk insufficiency is increased suckling frequency and duration.

3. **A mother who has weaned CAN redevelop her milk supply**

With enough nipple stimulation and milk removal, it is possible for women to re-lactate, that is to redevelop a milk supply. The stimulation can be provided by a willing baby or even older child, by hand expression and stimulation and/or pumping. The process may take several days or even a couple of weeks. Mothers need much encouragement, a reasonable supply of food and water and protection from stress to the extent possible. Babies, of course, need to be fed in the safest manner until the milk supply returns.

4. **Breastfeeding women need SPECIFIC ASSISTANCE; general promotion of breastfeeding is not enough.**

Lessons learned in development programs show that most health practitioners have little knowledge of breastfeeding and lactation management; these lessons apply equally to emergency programs. Women who suffer through violent situations leading to displacement and emergency situations are at increased risk of breastfeeding problems. Mothers need help, not just motivational messages. Relief agencies and field workers need training in milk production physiology and on how to counsel mothers to help them optimally breastfeed; how to assess proper positioning and effective suckling and remedy when needed. In some situations, breastfeeding specialists may be useful. Maternal perception of risk of breastmilk insufficiency is an important factor in a woman’s decision for early termination of breastfeeding. These perceptions may be intensified by the stress of emergency situations. Our first concerns should be ensuring optimal breastfeeding behaviors, which may require the selective feeding of lactating women and trauma counseling for women who may believe they don’t have enough milk. Policies and services which undermine optimal feeding such as giving food supplements to infants <6 months and using bottles for Oral Rehydration Solution, should be avoided. Successful breastfeeding will contribute to the restoration or enhancement of woman’s self-esteem, critical to her ability to care for herself and her family.

5. **Human milk substitutes (infant formula and/or milk) are NOT always needed**

Providing infants and young children caught in an emergency situation with substitutes for human milk is extremely risky. It should be undertaken only after
careful consideration and full awareness of the problems that may result. Human milk substitutes must be:

- limited to the special circumstances of the emergency;
- guaranteed for the lifetime of emergency;
- accompanied by additional health care resources, clean water, fuel, and means to treat diarrhea;
- include plans for the re-establishment of optimal feeding from the outset of the emergency.
- supervised by the local public health authorities.
- be provided in accordance with the International Code of Marketing of Breastmilk Substitutes

These guidelines should be disseminated and followed by all agencies working in emergency situations.

1. Optimal Feeding Practices in Emergencies:

- Initiation of breastfeeding within one hour of birth
- Effective infant positioning (latch-on)
- Frequent, on-demand feeding until about 6 months of age
- Exclusive, breastfeeding until 6 months of age
- Continuation of breastfeeding after beginning the addition of appropriate weaning foods at 6 months of age
- Sustained breastfeeding well into the second year of life or beyond
- Increased breastfeeding frequency and continued feeding during illness.
- Increased breastfeeding frequency after illness for catch up growth.

Feeding Infants Under Six Months in Emergencies: A Triage Approach to Decision-Making

Emergency situations are usually initially confusing and chaotic. Determining who needs what is an essential early step. For protecting and supporting breastfeeding, the first step is to identify infants who are or should be breastfed and further noting any infants who are temporarily or permanently without their mother. Ultimately three groups can be established:

1. one needing only breastfeeding support,
2. a second requiring more intensive re-lactation help
3. a third in which substitute feeding is deemed necessary and will need to be very carefully managed and monitored.
The following triage diagram may be helpful. It is from: *Infant Feeding in Emergencies: Policy, Strategy & Practice, Report of the Ad Hoc Group on Feeding in Emergencies, May 1999*. This tool is available from the Emergency Nutrition Network on their website: [www.ennonline.net/ife](http://www.ennonline.net/ife). The Emergency Nutrition Network has a large amount of useful information and tools regarding emergency situations and frequently updates the content of the web site. The interested reader is encouraged to review this material.

**Decision Making in Emergencies:**
**A Triage Approach for Feeding Infants Under Six Months of Age**

- **Mother Accompanying Child**
  - Mother BF (Breastfeeding) child before crises
    - Wet nursing acceptable and available
      - Lactation OK
        - Breastfeeding support
      - Lactation Interrupted/reduced
        - Lactation possible and acceptable
          - Breastfeeding support
      - Lactation not possible or acceptable
        - Ensure safe artificial feeding
  - Wet nursing not acceptable and available
    - Mother not BF (Breastfeeding) child
      - Wet Nursing not available
        - Breastfeeding support
      - Relactation Support
      - Ensure safe artificial feeding

- **Mother Not Accompanying Child**
  - Mother not BF (Breastfeeding) child
    - Wet Nursing not available
      - Breastfeeding support
      - Relactation Support
      - Ensure safe artificial feeding
D. Ten Major Provisions of the WHO International Code of Marketing of Breastmilk Substitutes and Subsequent World Health Assembly Resolutions

The following list summarizes the major provisions of the WHO Code of Marketing and the subsequent resolutions passed by the World Health Assembly (WHA). The original Code, passed by WHA resolution in 1981 has 11 articles. Through a process of reviews and resolutions undertaken by the WHA every two years, the Code has continued to remain current as a international guiding document. There are now 14 WHA resolutions. Over the years it has been made clear that it applies to any food that is marketed as suitable for infants (all formulas, juices, commercial semisolid weaning foods) as well as feeding bottles and nipples (teats).

1. No advertising or promotion of breastmilk substitutes and products within the scope of the code and relevant WHA resolutions to the General public.

2. *No free samples or gifts to mothers or health workers.*

3. Information and labels must advocate breastfeeding and warn against bottle feeding and contain no pictures or text that idealizes the use of breastmilk substitutes.

4. *The health care system must not be used to promote the use of breastmilk substitutes.*

5. No free or low-cost supplies of breastmilk substitutes.

6. *Health professionals allowed to receive samples only for research purposes.*

7. *Information to health workers must be scientific and factual*

8. No contact between marketing personnel and mothers.

9. *No gifts or personal samples to health workers.*

10. All information on artificial feeding, including labels, should explain the benefits of breastfeeding, the costs and hazards associated with artificial feeding and the correct use of breastmilk substitutes.

*Note that the italicized items (2, 4, 6, 7, and 9) are responsibilities of the health professionals.*

E. Academy of Breastfeeding Medicine
Protocol #8: Human milk storage information for home use for healthy full-term infants.

The Academy of Breastfeeding Medicine (ABM) was established in 1994 to bring together physicians from any discipline who have a common interest in supporting breastfeeding. ABM makes available (downloadable without charge) protocols regarding some of the most frequent clinical management concerns. For this Third Edition of the Self-Study Modules, Level I, the protocol which gives current guide lines on how to store of Human milk for healthy full term infants is included.
ABM Protocols

A central goal of The Academy of Breastfeeding Medicine is the development of clinical protocols for managing common medical problems that may impact breastfeeding success. These protocols serve only as guidelines for the care of breastfeeding mothers and infants and do not delineate an exclusive course of treatment or serve as standards of medical care. Variations in treatment may be appropriate according to the needs of an individual patient.

Protocol #8: Human milk storage information for home use for healthy full-term infants

STORAGE CONTAINERS
1. Hard-sided containers, such as hard plastic or glass, are the preferred containers for long-term human milk storage. These containers should have an airtight seal.1
2. Plastic bags specifically designed for human milk storage can be used for short-term (less than 72 hours) milk storage.1,2 Use of plastic bags is not recommended for long-term storage as they may spill, leak, or become contaminated more easily than hard-sided containers, and some important milk components may adhere to the soft plastic and be lost.

GENERAL GUIDELINES
1. Hands must be washed prior to expressing or pumping milk.
2. Use containers and pumping equipment that have been washed in hot, soapy water and rinsed. If available, cleaning in a dishwasher is acceptable; dishwashers that additionally heat the water may improve cleanliness. If a dishwasher is not available, boiling the containers after washing is recommended. Boiling is particularly important where the water supply may not be clean.
3. Store in small portions to minimize waste. Most breastfed babies take between 2 and 4 ounces (60–120 mL) of milk when beginning with an alternative feeding method. Storing in 2-ounce (60 mL) amounts and offering additional amounts if the baby is still hungry will prevent having to throw away unfinished milk.
4. Consider storing smaller size portions [1–2 ounces (30–60 mL) each] for unexpected situations. A small amount of milk can keep a baby happy until mom comes to nurse the baby.
5. Several expressions throughout a day may be combined to get the desired volume in a container. Chill the newly expressed milk for at least 1 hour in the main body of the refrigerator or in a cooler with ice or ice packs, and then add it to previously chilled milk expressed on the same day.
6. Do not add warm breast milk to frozen milk because it will partially thaw the frozen milk.
7. Keep milk from one day separate from other days.
8. Do not fill the container; leave some room at the top because breast milk expands as it freezes.
9. Label containers clearly with waterproof labels and ink, if possible.
10. Indicate the date that the milk was expressed and the child’s name (for daycare).
11. Expect that the milk will separate during storage because it is not homogenized. The cream will rise to the top of the milk and look thicker and whiter. Before feeding, gently swirling the container of milk will mix the cream back through again. Avoid vigorously shaking the milk.
12. The color of milk may vary from day to day, depending on maternal diet. It may look bluish, yellowish, or brownish. Frozen breast milk may also smell different than fresh breastmilk. There is no reason not to use the milk if the baby accepts it.

**Milk storage guidelines**

1. Milk may be kept at room temperature (up to 77°F or 25°C) for 6 to 8 hours. Temperatures greater than 77°F (25°C) may not be safe for room temperature storage. Containers should be covered and kept as cool as possible; covering the container with a cool towel may keep milk cooler.
2. Milk may be stored in an insulated cooler bag with ice packs for 24 hours.
3. Milk may be safely refrigerated (39°F or 4°C) for up to 5 days.
4. Store milk in the back of the main body of the refrigerator, where the temperature is the coolest.
5. The type of freezer in which the milk is kept determines timetables for frozen milk. Generally, store milk toward the back of the freezer, where the temperature is most constant. Milk stored for the longer durations in the ranges listed below is safe, but there is some evidence that the lipids in the milk undergo degradation resulting in lower quality.
   - Freezer compartment located inside the refrigerator (5°F or −15°C): 2 weeks
   - Refrigerator/freezer with separate doors (0°F or −18°C): 3 to 6 months
   - Chest or upright manual defrost deep freezer that is opened infrequently and maintains ideal temperature (−4°F or −20°C): 6 to 12 months
5. The above guidelines apply only to healthy, term infants; guidelines are different for hospitalized, sick, or preterm infants.

**Thawing or warming milk**

1. The oldest milk should be used first.
2. The baby may drink the milk cool, at room temperature, or warmed.
3. Thaw milk by placing it in the refrigerator the night before use or gently rewarm it by placing the container under warm running water or in a bowl of warm water.
4. Do not let the level of water in the bowl or from the tap touch the mouth of the container.
5. Milk may be kept in the refrigerator for 24 hours after it is thawed.
6. Never use a microwave oven or stovetop to heat the milk, as these may cause scald spots and will also destroy antibodies.
7. Swirl the container of milk to mix the cream back in, and distribute the heat evenly. Do not stir the milk.
8. Milk left in the feeding container after a feeding should be discarded and not used again.
9. As with all foods, do not re-freeze breast milk once it is thawed or partially thawed.

**REFERENCES**


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The Academy of Breastfeeding Medicine Protocol Committee
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Supported in part by a grant from the Maternal and Child Health Bureau, Department of Health and Human Services.
*Lead Author(s)
F. Guidelines for Hand Expression

1. Wash your hands with soap.

2. Apply warm moist cloths to your breasts for 3 or 4 minutes before beginning to express.

3. With 4 fingers together, gently massage your breasts in a circular pattern followed by light stroking of the breasts toward the nipples. This will help the let-down reflex to stimulate milk flow.

4. To express place your thumb on the top of your breast about 1 to 1½ inches (3 to 4 cm) back from the edge of the areola (the more pigmented portion near nipple) and your index finger underneath your breast also about 1 to 1½ inches (3 to 4 cm) from the edge of the areola.

5. Press your fingers and thumb back toward your rib cage and then gently compress your thumb and fingers together just behind the areola.

6. Rotate the position of your fingers and thumb around the areola to express all areas.

7. Alternate breasts every few minutes or when the flow slows. Repeat the massage and stroking of the breast and express cycle several times on each breast.

8. The appearance of the milk will change during the expression. At first the milk may appear thin and almost clear. After the let-down reflex begins the milk appears more creamy white. Some medications, foods and vitamins may slightly alter the color of the milk.

9. Note that the amount of milk obtained may vary at each expression. Don’t worry this is normal. It does not indicate that your milk production is declining.

10. You can express directly into clean glass or plastic bottles. Remember to not use plastic bottles that contain Bisphenol A.
G. Websites of interest in Lactation Management and Breastfeeding Promotion

The interest in lactation management and breastfeeding promotion has grown significantly since the first edition of these Self-Study Modules was published and many useful websites have appeared. Some of the more frequently used sites are listed on the following page. For the interested user of this Level I tool these sites will have further information about the topics included as well as additional information concerning topics that are not considered necessary to cover at Level I.
F. Websites of Interest in Lactation Management and Breastfeeding Promotion

Academy of Breastfeeding Medicine
www.bfmed.org

American Academy of Pediatrics
www.aap.org/healthtopics/breastfeeding.cfm

American Academy of Family Practice
www.aafp.org

American College of Obstetrics and Gynecology
www.acog.org

Baby-Friendly USA
www.babyfriendlyusa.org

U.S. Centers for Disease Control
www.cdc.gov/breastfeeding

Emergency Nutrition Network
www.ennonline.net/ife

International Baby Food Action Network
www.ibfan.org

International Lactation Consultants Association
www.ilca.org

International Society of Research in Human Milk and Lactation
www.isrhmil.org.umu.se

La Leche League International
www.llli.org

National Library of Medicine on-line service regarding drugs during lactation (LactMed)

UNICEF
www.unicef.org

U.S. Office of Women’s Health
www.womenshealth.gov/breastfeeding

Wellstart International
www.wellstart.org

World Health Organization (WHO)
www.who.int/child_adolescent_health and www.who.int/nutrition/en

World Alliance for Breastfeeding Action (WABA)
www.waba.org.my
Alphabetic Listing of References

A total of forty-eight references have been used in this Self-Study tool and are listed at the end of the section in which they were used. To facilitate a search for a particular text, paper or report these references have also been listed alphabetically.
17. Declercq, E et al (2009). Hospital practices and women’s likelihood of fulfilling their intention to exclusively breastfeed. AJPH 99 (5) 929-935. (2)


33. Lawrence RA and Lawrence RM (2005) *Breastfeeding, a guide for the medical profession, Sixth Edition*, St. Louis, MO: Mosby, Inc.(1,2,3)


40. Truitt ST, Fraser AB, Grimes DA, Gallo MF, Schulz KF. Cochrane Database Syst Rev. 2003; (2):CD003988. Combined hormonal versus nonhormonal versus progestin-only contraception in lactation. (3)


44. WHO (2009) *Infant and Young Child Feeding: Model Chapter for Textbooks for Medical Students and Allied Health Professionals*. WHO Geneva.


47. WHO/UNICEF (2006) Promotion and Support in a Baby-Friendly Hospital, 20 hour Course WHO Geneva (2)


*Section of the tool where the specific reference is used: (F) = Foreword, (1) = Module 1, (2) = Module 2, 3 = Module (3)*
Tests

The following section contains three tests. The first two are without answers, one to use as a pre-test and one for a post-test. The last version is the same test with briefly explained answers.
Lactation Management Self-Study Modules, Level I
Pre-Test

Please circle the appropriate response:

1. Infants exclusively breastfed for about six months will have:
   a. fewer episodes of diarrhea
   b. fewer episodes of lower respiratory infection
   c. both of the above
   d. none of the above

2. Compared to formula, human milk contains higher levels of:
   a. iron
   b. lipase
   c. vitamin A
   d. vitamin D
   e. none of the above

3. The hormone responsible for milk synthesis is:
   a. estrogen
   b. oxytocin
   c. progesterone
   d. prolactin

4. The hormone responsible for milk ejection is:
   a. estrogen
   b. oxytocin
   c. progesterone
   d. prolactin

5. Identify the component of human milk that binds iron locally to inhibit bacterial growth:
   a. lactoferrin
   b. macrophages
   c. oligosaccharides
   d. secretory IgA
   e. transferring
6. Identify the component of human milk that provides specific immunity against many organisms:
   a. lactoferrin
   b. macrophages
   c. oligosaccharides
   d. secretory IgA
   e. transferring

7. Which of the following would you suggest to a woman with inverted nipples during the third trimester?
   a. cut holes in the bra to allow the nipples to protrude; wear it day and night
   b. do nothing because the natural changes in the breast during pregnancy and the infant’s suckling postpartum may evert the nipples
   c. use breast shells with guidance from her health care provider
   d. use Hoffman’s maneuver four times a day to permanently evert her nipples

8. The most important criterion for assessing the milk transfer during a feeding at the breast is:
   a. audible swallow
   b. proper alignment
   c. proper attachment
   d. visible areola compression

   Answer: Position and attachment are important to achieve effectiveness, but the most important sign that the baby is transferring milk is hearing the swallow

1. A mother with a three-day old baby presents with sore nipples. The problem began with the first feeding and has persisted with every feeding. The most likely source of the problem is:
   a. baby’s suck is too strong
   b. feeding too long
   c. lack of nipple preparation during pregnancy
   d. poor attachment

10. Signs of adequate breast milk intake in the early (first 4-6) weeks include all EXCEPT:
   a. at least 3-4 stools in 24 hours
   b. at least 6 diapers wet with urine in 24 hours
   c. baby gains weight
   d. baby sleeps through the night
   e. sounds of swallowing
11. Severe engorgement is most often due to:
   a. high oxytocin level
   b. high prolactin level
   c. infrequent feedings
   d. postpartum depression

12. Nipple candidiasis can be associated with all of the following EXCEPT:
   a. burning pain in the breast
   b. fever and malaise
   c. oral thrush in the infant
   d. pink and shiny appearance of the nipples and areola

13. A breastfeeding mother with a 3-month old infant has a red tender wedge-shaped area on the outer quadrant of one breast. She has flu-like symptoms and a temperature of 39°C. Your management includes all of the following EXCEPT:
   a. antibiotics for 10 to 14 days
   b. extra rest
   c. interrupt breastfeeding for 48 hours
   d. moist heat to the involved region

14. Which of the following is most likely to have the greatest effect on the volume of milk a woman produces?
   a. maternal caloric intake
   b. maternal fluid intake
   c. maternal weight for height
   d. supplementation of the infant with formula
   e. both a and c

15. The addition of complementary foods to breastfed infants is recommended at about:
   a. 2 months
   b. 4 months
   c. 6 months
   d. 10 months
   e. 12 months

16. It is especially important that an infant with a strong family history of allergy should be exclusively breastfed for:
a. 2 months  
b. 4 months  
c. 6 months  
d. 8 months  
e. 12 months

17. The most common cause of poor weight gain among breastfed infants during the first four weeks after birth is:

a. infant metabolic disorders  
b. infrequent or ineffective feedings  
c. low fat content of breast milk  
d. maternal endocrine problems  
e. maternal nutritional deficiencies

18. Jaundice in a normal full term breastfeeding infant is improved by:

a. breastfeeding frequently (at least 8 or more times in 24 hours)  
b. giving glucose water after breastfeeding  
c. giving water after breastfeeding  
d. both a and c

19. Breastfeeding is contraindicated in which of the following conditions:

a. infant with galactosemia  
b. mother with hepatitis B  
c. mother with inverted nipples  
d. mother with mastitis  
e. both a and c

20. Hospital policies that promote breastfeeding include:

a. uninterrupted sleep the first night to allow mother’s milk supply to build up  
b. unlimited access of mother to baby  
c. use of a dropper for routine water supplementation  
d. use of pacifiers to prevent sore nipples

21. Studies have indicated that the Lactational Amenorrhea Method (LAM) of contraception is reliable providing that the baby:

a. is given no regular supplements  
b. continues with night feedings  
c. is less than 8 months old  
d. feeds 8 or more times in 24 hours
22. Breastfeeding support for mother infant pairs is an important component to include in planning for or responding to major emergencies where clean water, sanitation and power are disrupted because:
   
   a. Breastmilk provides immunoglobulins that actively prevent infection.  
   b. It is less expensive than providing for infant formula  
   c. In a stressful emergency situation breastfeeding provides a secure environment for infants and young children  
   d. With support even mothers who have already weaned can be assisted to relactate.

23. The International Code of Marketing of Breastmilk Substitutes approved as a resolution in the World Health Assembly (WHA) in 1981:
   
   a. provides guidelines for the ethical marketing of infant formula  
   b. is incorporated into the Baby Friendly Hospital assessment  
   c. was approved by all WHA member countries  
   d. is updated every two years by the WHA  
   e. includes bottles, nipples, and breastmilk substitutes

24. through 28. Label the structures of the breast by inserting next to the appropriate pointer the number of the structure listed below:

24. Alveoli  
25. Areola  
26. Montgomery’s glands  
27. Duct  
28. Paranchyma
Lactation Management Self-Study Modules, Level I
Post-Test

Please circle the appropriate response:

1. Identify the component of human milk that binds iron locally to inhibit bacterial growth:
   a. taurine
   b. secretory IgA
   c. macrophages
   d. lactoferrin
   e. oligosaccharides

2. Identify the component of human milk that provides specific immunity against many organisms:
   a. taurine
   b. secretory IgA
   c. macrophages
   d. lactoferrin
   e. oligosaccharides

3. The most important criterion for assessing the milk transfer during a feeding at the breast is:
   a. visible areola compression
   b. audible swallow
   c. proper alignment
   d. proper attachment

4. Compared to formula, human milk contains higher levels of:
   a. vitamin D
   b. iron
   c. lipase
   d. vitamin A
   e. none of the above

5. The hormone responsible for milk ejection is:
   a. progesterone
   b. prolactin
   c. estrogen
   d. oxytocin
6. A mother with a three-day old baby presents with sore nipples. The problem began with the first feeding and has persisted with every feeding. The most likely source of the problem is:

a. feeding too long  
b. poor attachment  
c. baby’s suck is too strong  
d. lack of nipple preparation during pregnancy

7. The hormone responsible for milk synthesis is:

a. progesterone  
b. prolactin  
c. estrogen  
d. oxytocin

8. Which of the following would you suggest to a woman with inverted nipples during the third trimester?

a. Use breast shells with guidance from her health care provider  
b. Cut holes in the bra to allow the nipples to protrude; wear it day and night  
c. Use Hoffman’s maneuver four times a day to permanently evert her nipples  
d. Do nothing because the natural changes in the breast during pregnancy and the infant’s suckling postpartum may evert the nipples

9. Which of the following is most likely to have the greatest effect on the volume of milk a woman produces?

a. maternal weight for height  
b. maternal fluid intake  
c. supplementation of the infant with formula  
d. maternal caloric intake  
e. both a and c

10. Infants exclusively breastfed for about six months will have:

a. Fewer episodes of lower respiratory infection  
b. fewer episodes of diarrhea  
c. none of the above  
d. both of the above

11. The addition of complementary foods to breastfed infants is recommended at about:

a. 2 months  
b. 4 months  
c. 6 months  
d. 10 months  
e. 12 months
12. Signs of adequate breast milk intake in the early (first 4-6) weeks include all EXCEPT:

   a. baby gains weight
   b. at least 3-4 stools in 24 hours
   c. sounds of swallowing
   d. baby sleeps through the night
   e. at least 6 diapers wet with urine in 24 hours

13. It is especially important that an infant with a strong family history of allergy should be **exclusively** breastfed for:

   a. 2 months
   b. 4 months
   c. 6 months
   d. 8 months
   e. 12 months

14. Severe engorgement is most often due to:

   a. high oxytocin level
   b. infrequent feedings
   c. high prolactin level
   d. postpartum depression

15. The most common cause of poor weight gain among breastfed infants during the first four weeks after birth is:

   a. maternal endocrine problems
   b. maternal nutritional deficiencies
   c. infant metabolic disorders
   d. infrequent or ineffective feedings
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   a. extra rest
   b. interrupt breastfeeding for 48 hours
   c. moist heat to the involved region
   d. antibiotics for 10 to 14 days

17. Studies have indicated that the Lactational Amenorrhea Method (LAM) of contraception is reliable providing that the baby:

   a. feeds 8 or more times in 24 hours
   b. is given no regular supplements
   c. is less than 8 months old
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   e. includes bottles, nipples, and breastmilk substitutes

19. Nipple candidiasis can be associated with all of the following EXCEPT:
   a. oral thrush in the infant
   b. burning pain in the breast
   c. fever and malaise
   d. pink and shiny appearance of the nipples and areola

20. Jaundice in a normal full term breastfeeding infant is improved by:
   a. giving glucose water after breastfeeding
   b. giving water after breastfeeding
   c. breastfeeding frequently (at least 8 or more times in 24 hours)
   d. both a and c

21. Breastfeeding is contraindicated in which of the following conditions:
   a. infant with galactosemia
   b. mother with mastitis
   c. mother with hepatitis B
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22. Breastfeeding support for mother infant pairs is an important component to include in planning for or responding to major emergencies where clean water, sanitation and power are disrupted because:
   a. It is less expensive than providing for infant formula
   b. With support even mothers who have already weaned can be assisted to relactate
   c. Breastmilk provides immunoglobulins that actively prevent infection.
   d. In a stressful emergency situation breastfeeding provides a secure environment for infants and young children.

23. Hospital policies that promote breastfeeding include:
   a. use of a dropper for routine water supplementation
   b. uninterrupted sleep the first night to allow mother’s milk supply to build up
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24. Montgomery’s glands
25. Paranchyma
26. Alveoli
27. Areola
28. Duct
Please circle the appropriate response:

1. Identify the component of human milk that binds iron locally to inhibit bacterial growth:

   a. taurine
   b. secretory IgA
   c. macrophages
   d. **lactoferrin**
   e. oligosaccharides

   **Answer:** Lactoferrin is an iron-binding protein of external secretions, including human milk. It inhibits the growth of iron-dependent microorganisms in the gut.

2. Identify the component of human milk that provides specific immunity against many organisms:

   a. taurine
   b. **secretory IgA**
   c. macrophages
   d. lactoferrin
   e. oligosaccharides

   **Answer:** Secretory IgA is the main immunoglobulin in human milk. IgA is produced in the Mammary gland in B cells, which originate at maternal sites of high environmental pathogen exposure and therefore protects the infant against pathogens present in the immediate environment.

3. The **most** important criterion for assessing the milk transfer during a feeding at the breast is:

   a. visible areola compression
   b. **audible swallow**
   c. proper alignment
   d. proper attachment

   **Answer:** Position and attachment are important to achieve effectiveness, but the most Important sign that the baby is transferring milk is hearing the swallow.

4. Compared to formula, human milk contains higher levels of:

   a. vitamin D
   b. iron
   c. **lipase**
   d. vitamin A
5. The hormone responsible for milk ejection is:
   a. progesterone
   b. prolactin
   c. estrogen
   d. **oxytocin**

6. A mother with a three-day old baby presents with sore nipples. The problem began with the first feeding and has persisted with every feeding. The most likely source of the problem is:
   a. feeding too long
   b. **poor attachment**
   c. baby’s suck is too strong
   d. lack of nipple preparation during pregnancy

   Answer: The most common cause of sore nipples is **poor attachment of the infant’s mouth to the mother’s nipple**. Poor attachment often begins with the first feeding and if not corrected continues to contribute to increasing pain and trauma. **Nipple preparation during pregnancy is not recommended because studies have shown no effect on nipple comfort.**

7. The hormone responsible for milk synthesis is:
   a. progesterone
   b. **prolactin**
   c. estrogen
   d. oxytocin

8. Which of the following would you suggest to a woman with inverted nipples during the third trimester?
   a. Use breast shells with guidance from her health care provider
   b. Cut holes in the bra to allow the nipples to protrude; wear it day and night
   c. Use Hoffman’s maneuver four times a day to permanently evert her nipples
   d. **Do nothing because the natural changes in the breast during pregnancy and the infant’s suckling postpartum may evert the nipples**

   Answer: Studies (MAIN Trial Collaborative Group, 1994) have demonstrated that prenatal nipple stretching exercises such as Hoffman’s maneuver and the use of breast shells to encourage the nipple to protrude are equally or less helpful than no intervention at all. The mother should receive assistance postpartum.

9. Which of the following is most likely to have the greatest effect on the volume of milk a woman produces?

   e. none of the above

   *Answer: Formula does not contain enzymes including lipase. Vitamins A and D have been added to formula in an amount similar to breast milk. Formula actually contains more iron (but the iron is less bioavailable).*
a. maternal weight for height  
b. maternal fluid intake  
c. **supplementation of the infant with formula**  
d. maternal caloric intake  
e. both a and c  

Answer: *Mother’s milk volume is fairly well protected. A mother’s caloric or fluid intake may effect her own energy level or urine output but is not directly related to her breastmilk volume. Giving formula results in the infant taking less breast milk; therefore, the mother’s breasts are less stimulated and the supply drops.*

10. Infants exclusively breastfed for about six months will have:

a. Fewer episodes of lower respiratory infection  
b. fewer episodes of diarrhea  
c. none of the above  
d. **both of the above**  

Answer: *In the U.S., the risk of otitis media is reduced by 50% in breastfed infants. The antibodies in human milk protect the infant from the organisms that cause diarrhea. At least 60% of the infant deaths in the U.S. from diarrheal disease are attributed to not being breastfed.*

11. The addition of complementary foods to breastfed infants is recommended at about:

a. 2 months  
b. 4 months  
c. **6 months**  
d. 10 months  
e. 12 months  

Answer: *Breast milk alone maintains adequate nutrition and growth up to 6 months of age in most infants. In addition feeding skills are learned in corresponding developmental sequence. By 6 months of age, the infant can transfer a bolus from the anterior tongue to the pharynx, allowing manipulation of a pureed or solid food.*

12. Signs of adequate breast milk intake in the early (first 4-6) weeks include all EXCEPT:

a. baby gains weight  
b. at least 3-4 stools in 24 hours  
c. sounds of swallowing  
d. **baby sleeps through the night**  
e. at least 6 diapers wet with urine in 24 hours  

Answer: *Breastfeeding babies need to eat a minimum of eight times (about every three hours, day and night) in the early weeks. Sleeping long stretches at night may be seen after about six weeks of age. A baby who sleeps all night in the beginning is probably not getting enough calories.*
13. It is especially important that an infant with a strong family history of allergy should be \textit{exclusively} breastfed for:

a. 2 months  
b. 4 months  
c. \textbf{6 months}  
d. 8 months  
e. 12 months

\textit{Answer: Exposure to non-human proteins prior to 6 months increases the likelihood of allergies.}

14. Severe engorgement is most often due to:

\begin{itemize}
  \item [a.] high oxytocin level
  \item [b.] \textbf{infrequent feedings}
  \item [c.] high prolactin level
  \item [d.] postpartum depression
\end{itemize}

\textit{Answer: The most common cause of engorgement is mechanical: infrequent or ineffective milk removal. The solution is milk removal by the baby, hand expression or a pump and frequent, effective breastfeeds thereafter.}

15. The most common cause of poor weight gain among breastfed infants during the first four weeks after birth is:

\begin{itemize}
  \item [a.] maternal endocrine problems
  \item [b.] maternal nutritional deficiencies
  \item [c.] infant metabolic disorders
  \item [d.] \textbf{infrequent or ineffective feedings}
  \item [e.] low fat content of breast milk
\end{itemize}

\textit{Answer: The lack of stimulation to the breasts causes a decrease in milk supply and the infant does not receive enough calories and other nutrients and human milk constituents to grow.}

16. A breastfeeding mother with a 3-month old infant has a red tender wedge-shaped area on the outer quadrant of one breast. She has flu-like symptoms and a temperature of 39\degree C. Your management includes all of the following EXCEPT:

\begin{itemize}
  \item [a.] extra rest
  \item [b.] \textbf{interrupt breastfeeding for 48 hours}
  \item [c.] moist heat to the involved region
  \item [d.] antibiotics for 10 to 14 days days
\end{itemize}

\textit{Answer: An essential part of the treatment of mastitis is maintaining milk flow through the breasts by breastfeeding, hand expression or pumping. Mastitis is a cellulitis and the milk itself is not harmful to the infant. The usual antibiotics (dicloxacillin/erythromycin) used to treat mastitis are safe for the baby.}
17. Studies have indicated that the Lactational Amenorrhea Method (LAM) of contraception is reliable providing that the baby:

   a. feeds 8 or more times in 24 hours
   b. is given no regular supplements
   c. **is less than 8 months old**
   d. continues with night feedings

**Answer:** The neurohormones of lactation suppress ovulation. However several well designed studies indicate that the reliability decreases beyond 6 months postpartum even if all other LAM guidelines are strictly followed.

18. The International Code of Marketing of Breastmilk Substitutes approved as a resolution in the World Health Assembly (WHA) in 1981:

   a. is updated every two years by the WHA
   b. provides guidelines for the ethical marketing of infant formula
   c. is incorporated into the Baby Friendly Hospital assessment
   d. **was approved by all WHA member countries**
   e. includes bottles, nipples, and breastmilk substitutes

**Answer:** The United States was the only nation that did not approve the resolution in 1981.

19. Nipple candidiasis can be associated with all of the following EXCEPT:

   a. oral thrush in the infant
   b. burning pain in the breast
   c. **fever and malaise**
   d. pink and shiny appearance of the nipples and areola

**Answer:** Nipple candidiasis is a local fungal infection and usually does not cause systemic symptoms

20. Jaundice in a normal full term breastfeeding infant is improved by:

   a. giving glucose water after breastfeeding
   b. giving water after breastfeeding
   c. **breastfeeding frequently (at least 8 or more times in 24 hours)**
   d. both a and c

**Answer:** Water and/or glucose do nothing to relieve hyperbilirubinemia. Jaundice in normal full term breastfeeding infant is lessened by the passage of meconium, which is stimulated by the ingestion of colostrum and human milk. Adequate caloric intake is also important to reducing intestinal bilirubin absorption, an additional factor in reducing jaundice.

21. Breastfeeding is contraindicated in which of the following conditions:

   a. **infant with galactosemia**
   b. mother with mastitis
   c. mother with hepatitis B
d. mother with inverted nipples

e. both a and c

Answer: Galactosemia in the infant is one of the rare medical problems that preclude breastfeeding/breastmilk. Mothers with Hepatitis B may begin breastfeeding their infants before receiving HBIG and the first dose of Hepatitis B vaccine series. Mothers with mastitis should continue to breastfeed and the milk is safe for the baby. Mothers with inverted nipples can be helped to breastfeed in many cases.

22. Breastfeeding support for mother infant pairs is an important component to include in planning for or responding to major emergencies where clean water, sanitation and power are disrupted because:

a. It is less expensive than providing for infant formula
b. With support even mothers who have already weaned can be assisted to relactate
c. Breastmilk provides immunoglobulins that actively prevent infection.
d. In a stressful emergency situation breastfeeding provides a secure environment for infants and young children

Answer: Infants who are breastfed do considerably better in emergency situations because of the combination of nutrition, fluids, disease prevention immunoglobulins and security that nursing provides. The use of even donated (free)formula should be kept at a minimum.

23. Hospital policies that promote breastfeeding include:

a. use of a dropper for routine water supplementation
b. uninterrupted sleep the first night to allow mother’s milk supply to build up
c. unlimited access of mother to baby
d. use of pacifiers to prevent sore nipples

Answer: Rooming-in provides the mother opportunity to breastfeed frequently without a hospital-imposed schedule. Frequent breast stimulation will build the milk supply. Routine water supplementation is not recommended by any means and pacifiers may interfere with the infants suckling at the breast.

24. through 28. Label the structures of the breast by inserting next to the appropriate pointer the number of the structure listed below:

24. Montgomery’s glands
25. Paranchyma
26. Alveoli
27. Areola
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