

WIC: Making a Difference
for Families



INFANT NUTRITION MODULE

Level II

Arkansas WIC Program
Department of Health

Adapted from Colorado Department of Public Health & Environment Nutrition Services WIC Program 2006

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Infant Nutrition Module Level II

Performance Objectives

After completing this module, the learner will be able to:

1. Explain why breastmilk is the best milk for infants in their first year of life and identify the benefits of breastfeeding.
2. Identify the brand names of infant formulas that are made from cow's milk and the brand names of infant formulas that are made from soybeans.
3. Identify how to correctly mix the following forms of infant formula: concentrate, powder, and ready-to-use.
4. Explain to a WIC parent or caregiver why sterilization and sanitation measures used during bottle preparation are very important.
5. Identify the types of milk that are recommended to feed to an infant during the first year of life.
6. Answer a WIC parent's or caregiver's basic questions about the feeding schedules of newborn infants--birth to 4 months old.
7. List the only three items that should be fed from a bottle.
8. State when complementary foods should be introduced in an infant's diet based on the developmental and feeding skills of healthy, full term infants.
9. Identify appropriate foods to feed to a four to eight-month-old infant.
10. Recognize appropriate and inappropriate feeding practices for infants.
11. Identify appropriate foods to feed an eight to 12 month old infant.
12. Name foods that are a choking hazard to infants.
13. Define "early childhood caries" and list its causes.
14. Explain the importance of fluoride in infant dental health.
15. Explain to a WIC parent or caregiver the process of weaning an infant from the breast or bottle to a cup.
16. Identify the foods that supply iron for an infant and explain how absorption of iron by the body can be increased.
17. Identify tips for helping infants develop healthy eating habits.
18. Identify the five main categories of infant nutrition assessment risk factors and define the risk factors in each category.
19. Give counseling tips to WIC parents or caregivers for each infant nutrition assessment risk factor.



Introduction

Growth during the first year of life is faster than at any other time. An infant's birth weight will usually double by four to six months of age and triple by the first birthday. Good nutrition during this period of rapid growth is vital to ensure that the infant develops both physically and mentally to their fullest potential.



The age recommendations made throughout this module on infant nutrition include the earliest recommended age for a given procedure—whether it's introducing complementary foods, finger foods, or weaning from a bottle to a cup. All infants' progress at their own rate and differences in developmental rates are to be expected. An infant who does not fall within the average age range for readiness to progress to the next feeding method can still be considered normal. If in doubt about a specific behavior or practice, the Nutritionist should be consulted.

Nutrition for the Newborn



During the early months, most of the time spent between parents and other caregivers and the infant is in feeding. For the infant who is growing properly, it is important that parents trust their infant to share control by feeding the infant on demand and letting him/her eat as much or as little as he/she wants. During these early months nutritional needs can be entirely met with breastmilk or iron-fortified infant formula. Breastmilk is the preferred milk for infants. You will learn more about breastfeeding in the *Level II Competency Based Breastfeeding Training Module I: WIC CPAs and Breastfeeding Counselors.*

If breastfeeding is not chosen, iron-fortified infant formula is the recommended alternative. When infant formula is used, proper preparation and handling is important.



Current recommendations for complementary food (solid food) introduction are that complementary foods should be introduced *around* six months of age. The introduction of complementary foods should always include consideration of the infant's developmental readiness and nutritional needs. Even after complementary foods have been introduced, it is strongly recommended that infants continue to breastfeed or receive an iron-fortified formula through their first year of life. Even though it is recommended that most infant formulas be discontinued at one year of age, breastfeeding can continue as long as mother and child mutually agree to breastfeed.



Breastfeeding Is Best

Breastmilk is the best milk for infants in their first year of life.

Human milk is perfectly suited to the nutritional needs of the human infant, which makes it superior to infant formula and cow's milk.

Benefits of Breastfeeding

The following is an abbreviated list of benefits afforded to the infant and mother when breastfeeding (refer to **WIC Competency Based Training Module Level II - Breastfeeding Competency Based Training for CPAs** for a more complete list):

- ✓ **The nutrient composition of breastmilk is ideal:**
 - While formula contains nutrients necessary for growth, human milk has the perfect composition for the infant and changes as the infant's needs change. Breastmilk is easily digested and nutrients are easily absorbed.
 - Constipation is rare among breastfed infants.
 - The fat (lipid) portion of human milk is almost completely digestible, providing an excellent source of calories for energy.
 - Breastmilk contains more cholesterol than cow's milk and infant formula. Cholesterol is a necessary component in the formation of myelin, the covering of the nerve and brain cells. This covering is necessary for the development of muscular coordination of the infant during the first year of life.
 - Breastmilk has factors that aid the absorption of iron and zinc.
 - Breastfed infants have fewer illnesses than formula fed infants. Breastmilk is rich in antibodies that protect the infant against infection and serious illness, including diarrhea, respiratory infections, and stomach/intestinal illnesses.
- ✓ **Breastfeeding is easier to manage than bottle feeding:**
 - There is no mixing, measuring, or sterilizing involved with breastfeeding.
 - Breastmilk is always at the correct temperature for baby.

- Breastmilk is very portable and always ready when it is needed!
- ✓ **Overfeeding the infant becomes less likely because the mother cannot tell how much the infant has ingested during breastfeeding and, therefore, cannot encourage the infant to "finish the bottle."**
- ✓ **There is less likelihood of developing allergies. Breastmilk promotes maturation of the gastrointestinal tract to prevent allergens from entering the body. Cow's milk proteins are highly allergenic and early exposure could result in allergic symptoms later in life.**
- ✓ **The mother-infant bond may be enhanced.**
- ✓ **Breastfeeding saves money. There is no need for expensive formulas and fewer trips are made to the doctor's office with a sick infant.**

Support of Breastfeeding



Breastfeeding is recognized by health care professionals as the best feeding choice for infants. The American Dietetic Association, The American Medical Association, The American Public Health Association, and The American Academy of Pediatrics have all developed statements supporting the promotion of breastfeeding. See the following website for breastfeeding support position statements:

<http://aappolicy.aappublications.org/cgi/reprint/pediatrics;115/2/496.pdf>

For breastfeeding to be successful there must be a strong emotional support system for the mother. This support system includes WIC staff, the family, as well as the health care team and other mothers who have successfully breastfed their infants. The mother needs breastfeeding information before she begins breastfeeding, and continued information and support after breastfeeding has started.

In instances where breastfeeding is unsuccessful or inappropriate (such as if the woman has tested positive for HIV, the virus that causes AIDS), or stopped early, the mother should not be made to feel guilty about her decision to switch to formula feeding. She should continue to receive encouragement and support from the health care team.

The following begins a series of Self-Checks that occur throughout this module. Complete each Self-Check in order. Check your answers after each Self-Check. The answers are at the back of the module.

√ SELF-CHECK #1

1. Which of the following are reasons why breastmilk is the best milk for infants?
 - a. It is perfectly suited to the nutritional needs of an infant.
 - b. Breastmilk has special substances that protect an infant against infections.
 - c. Breastmilk is portable and ready when needed.
2. True or False
 - a. Breastmilk is easily digested and nutrients are easily absorbed.
 - b. Constipation is common among breastfed infants.
 - c. Breastmilk is always at the correct temperature while baby is nursing.
 - d. In cases where breastfeeding is unsuccessful, the mother should not be made to feel guilty—she should continue to receive support from the health care team.

Did You Know . . .

Infant formula manufacturers now have infant formulas supplemented with two fatty acids, docosahexanoic acid (DHA) and arachidonic acid (ARA). DHA and ARA are present in breastmilk and are thought to be associated with visual and mental development in infants. The theory is that formulas enhanced with DHA and ARA may promote improved visual and mental development outcomes in formula fed babies, more similar to breastfed babies. While research suggests that some premature formula fed infants may benefit from DHA and ARA supplementation, studies involving term infants are inconclusive.

Contrary to popular belief, the iron in iron-fortified formulas does NOT cause gastrointestinal distress such as constipation, colic, and diarrhea in infants

Exempt Formula: Special formulas that are exempt from the Federal Food, Drug and Cosmetic Act regulations due to their special formulation.

See web site:

<http://www.fda.gov/Food/FoodSafety/Product-SpecificInformation/InfantFormula/GuidanceRegulatoryInformation/ucm106456.htm>

Formula Feeding

Although breastmilk is ideal for a baby, iron-fortified infant formula is the recommended alternative. It is important that for the first year of life the formula be iron-fortified to prevent iron deficiency anemia. Low-iron formula puts the baby at risk for more illness, delays in mental and motor development and impaired energy metabolism.

Infant formulas are modified to be nutritionally similar (but not identical) to breastmilk. Nutrients are added to infant formulas to promote optimal infant growth.

Types of Infant Formulas

A variety of infant formulas are available for healthy, full term infants who are not breastfed or are partially breastfed. These include:

- Cow's milk-based formulas; made from cow's milk; iron fortified; most infants tolerate without problems.
- Soy milk-based formulas; made from soybeans; iron fortified; available for all infants as well as infants who are unable to tolerate cow's milk formulas.
- Hypoallergenic formulas; designed to meet the nutritional needs of infants with allergies or intolerances to milk or soy-based infant formulas; usually more expensive.

Exempt formulas are those that are represented and labeled for use by infants who have inborn errors of metabolism or low birthweight, or who otherwise have unusual medical or dietary problems. There are many varieties of specially designed infant formulas developed for infants with special medical conditions.

WIC requires all infants who are on many of the hypoallergenic and all of the exempt formulas to be referred to the Nutritionist for High Risk nutrition counseling.

Formula Packaging

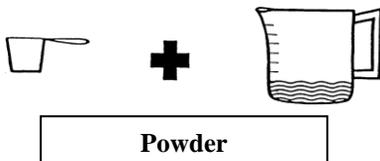
Most formulas are available in powder, concentrate or ready-to-use (RTU) forms. It is very important for the WIC Competent sional Authority (CPA) to evaluate if the formula is mixed or pared according to the label instructions or special physician tions. A complete nutrition assessment should include an assessment of how the formula is being mixed. Review this information with the parent or caregiver.

WIC CPAs should not recommend that parents and caregivers change the formula dilution unless the WIC professional has discussed it with the physician.

Formula Preparation

When preparing formulas for feeding, it is very important that parents and caregivers follow the directions on the label to correctly mix the formula and to handle it carefully to avoid contamination.

1 scoop formula + 2 ounces water



Powder formula is usually mixed with water in a ratio of one level scoop of formula to two ounces of water. (The scoop is included in the can.). The formula can label gives exact dilution directions (check label for directions for packed or unpacked scoop). When mixing powder formula, fill the bottle with water first, and then add the powder formula to the water. Powder formula comes in different size cans. **Powder formula is suggested for breastfed infants needing a supplemental bottle because small amounts can be mixed at one time and, once opened, the can of powder formula can be stored up to one month.**

Concentrate liquid formula requires dilution with water in a one-to-one ratio; that is, one 13-ounce can of concentrate formula is mixed with 13 ounces of water.

Ready-to-use formula requires no mixing or diluting with water and is available in bottles and cans of various sizes. The ready-to-use formula is generally the most expensive but may be provided when:

- the family's water supply is contaminated,
- the caregiver has difficulty in correctly diluting concentrate or powder formula,
- a physician prescribes it for a premature infant with a fragile immune system.

*Once a can of liquid concentrate or ready-to-use formula is opened, it should be stored in a covered container in a refrigerator and used within **48 hours**. Once a can of powder formula is opened, it should be covered and stored in a cool, dry place for no longer than one month. **DO NOT** refrigerate opened cans of powder formula. Once powder formula is mixed with water it should be used within **24 hours**.*

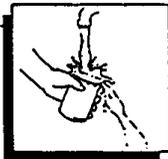
Cleaning and Sterilizing the Bottles

Infants 3 months of age and younger are more likely to contract illnesses from micro-organisms in bottles and nipples that are improperly cleaned, cleaned in contaminated water, or filled with contaminated water. That is why, for infants less than 3 months old, glass or hard plastic bottles and bottle parts (nipples, caps, rings) should first be thoroughly cleaned using soap, hot water, and bottle and nipple brushes, and then either sterilized or washed in a properly functioning dishwasher.

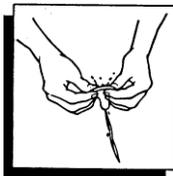
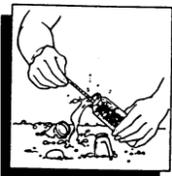
The two recommended methods of cleaning and sterilizing bottles and bottle parts (nipples, caps, rings) are:

1. **Aseptic method of sterilization.**
2. **Washing in a properly functioning dishwasher**

Aseptic Method



1. Wash hands and top of formula can.



2. Wash bottles, nipples, caps and rings.

1. Aseptic Method

The aseptic method of sterilization is recommended when cleaning bottles without use of a dishwasher. Special care is given to ensure that each item coming in contact with the formula or any item used in preparing the formula is as clean as possible before the formula is mixed.

The following describes the steps to be taken for the aseptic method of bottle sterilization:

1. The preparer's hands should be thoroughly washed. The top of the formula can should be washed before opening to eliminate contaminants. The can opener should also be washed.
2. Wash bottles, nipples (with a bottle brush), caps, rings, and tongs in hot, soapy water. Squeeze clean water through nipple holes to be sure they are open. Rinse all items well.



3. Sterilize bottles, nipples caps, rings, tongs.

- Place these objects in a large pan and cover with water. Bring to a boil. Boil for five minutes with the lid on. Let cool. Remove bottle supplies from pan with tongs and place on clean cloth or paper towel to dry.

2. Dishwasher Method

Separate bottles, rings and nipples. Prewash nipples with a nipple brush in hot soapy water. Place nipples and rings where the water can wash them unobstructed. Let air dry.

Cleaning and sterilizing bottles by either of the above methods should be continued until the infant is at least three months old. This same process should be used for bottles that will contain expressed breastmilk. After three months, unless otherwise indicated by a health care provider, bottles should be thoroughly washed using a bottlebrush with hot soapy water, or cleaned in a dishwasher.

Safety Advice:

Formula should never be made with water from the hot water faucet. The hotter the water is run through a lead pipe, the more risk of leaching lead into the water. Please remind parents and other caregivers to use COLD tap water, have them boil it the recommended amount of time, and then mix appropriately with formula for infants three months and younger.

Preparing the Water

Formula makers provide directions for mixing their products with water, but don't specify the water source. In general, tap water that comes from a municipal system is safe to use. As a precaution, it is generally recommended to boil the water used for infant formula preparation for infants under three months of age. Allow *cold* tap water to run for a short period of time (2-3 minutes) before collecting the water (lessens the amount of lead that can be leached into the water). Caregivers can boil water to make infant formula by bringing the water to a rolling boil, boiling it for 1-2 minutes and then letting it cool. Parents and caregivers should consult their health care provider regarding whether to continue to use boiled water for formula preparation for the infant older than 3 months of age.

Some parents and caregivers use bottled water or "nursery" water to mix infant formula because of fear of water safety. Counsel parents and caregivers to treat bottled water the same as tap water—as an added precaution it should be sterilized for use with infants younger than three months. (Nursery water and distilled water are not sterile and should be sterilized also.)

If the family is using water from their private well, encourage them to learn about the safety of their home's water. They may need to have

their water tested for bacteria, nitrate, and heavy metals (e.g., lead) contamination. (The Department of Health State Laboratory will analyze for bacterial contamination.) Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. Boiling water will not free the water of nitrate or heavy metals, and because of the evaporation of the steam, the nitrate or metals will actually be concentrated in the remaining water. If the quality of the water is undesirable, the family should use commercially bottled water and follow recommendations for sterilizing for infants less than three months of age. More information on possible contaminants in well water can be found on the Environmental Protection Agency's (EPA) Web site at <http://www.epa.gov/safewater/privatewells/index2.html> or the EPA Safe Drinking Water Hotline at 1-800-426-4791 between 8 a.m. and 4 p.m. Central Standard Time (CST).

Fluoride

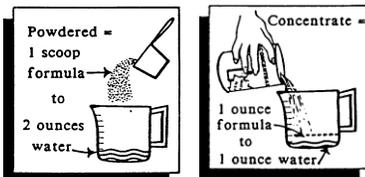
Fluoride content in water used for formula preparation is another issue that must be considered, whether tap or bottled water is used. Fluoridated water is beneficial in reducing tooth decay. However, excessive amounts of fluoride can cause staining or "mottling" of the tooth enamel. More on fluoride will be discussed later in this module.

Refer the parent or caregiver to the physician or dentist for suggestions on how to give the right amount of fluoride to their infant. This table shows acceptable fluoride concentrations for bottled water given to infants as their primary water source. Be sure to read the label of the bottled water – if fluoride is added, it must be labeled as fluoridated water.



Fluoride Concentration Guidelines
for Bottled Water Given to Infants

Age	Optimal	Minimal	Maximum
Birth to 6 months	0.7 mg/L	0.0 mg/L	1.2 mg/L
6 to 12 months	0.7 mg/L	0.3 mg/L	1.2 mg/L



4. Prepare formula.

Preparing the Formula

The preparer's hands should be thoroughly washed. The top of the formula container should be washed before opening in order to eliminate contaminants such as bug spray, dust, roach droppings, etc. The can opener should also be washed (if using electric opener clean all removable parts that come in contact with the formula can).

Cleanliness during formula preparation and proper refrigeration of bottles is very important through the first year of life because these measures help prevent gastrointestinal problems caused by bacteria.

Mix powder or concentrate formula with the boiled water once it has cooled to warm bath water temperature (100 degrees F) in a clean container according to the label on the can. Powder formula mixes best at this temperature.

Concentrate – Mix equal amounts of the concentrate formula with equal amounts of water (1:1 ratio). For example, mix 13 ounces of formula (1 can) with 13 ounces of water.

Powder – Fill bottle in 2-ounce increments of water. For every 2 ounces of water add one scoop of powder formula.

See Preparation Checklists at the end of this section for the three formula types (ready to use, concentrate, and powder).

NOTE: Carefully read the label on the formula can for the appropriate directions for dilution. Only a physician should make any variation from the recommended dilution. Improper dilution of formula can result in very serious health problems for the infant. Formula mixed with too little water might put an excessive burden on an infant's kidneys and digestive system and may lead to dehydration. Formula mixed with too much water might not supply the calories and nutrients needed for recommended growth and may provide an overload of water or *water intoxication* that can be equally dangerous to the infant.

Reasons Parents and Caregivers Incorrectly Dilute Formula

There are a variety of reasons why a parent or caregiver may not follow the instructions for proper dilution.

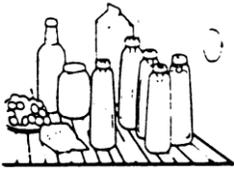
Some reasons parents and caregivers **over dilute** (add too much water) formulas are because they believe:

- it will help a baby with constipation, spitting up, diarrhea,
- it will help control the baby's weight,
- it will reduce the amount of iron to the baby, and
- it will make the formula last longer.

Some reasons parents and caregivers **over concentrate** (not enough water added) formula are due to the belief that

- it will help the baby sleep through the night,
- it will help the baby grow faster,
- it will thicken the formula to fill the baby up.

Also some parents and caregivers have difficulty measuring the formula, and therefore, over concentrate the formula.



5. Store formula.

When preparing formula to be stored, pour the formula into bottles in single feeding portions. Using tongs, place nipples (upside down), disc seals, and caps on the filled bottles. Store prepared bottles of formula made from powder formula in refrigerator for no more than 24 hours.

Counseling Tip

An easy way to tell parents and caregivers how to mix **concentrate** formula with water is to pour the contents of a 13-ounce can of concentrate formula into a **clean** container. Fill the empty formula can with cooled boiled water and pour this water into the container with the concentrate formula. Mix well. With this method the caregiver doesn't have to worry about the "exactness" of the ounce-for-ounce mixing. The final mixture is 26 ounces of prepared formula (13 ounces of concentrate formula plus the 13 ounces of water). Pour the mixture into clean bottles. This is similar to the method used to prepare frozen juice, where the empty can becomes the measuring device.

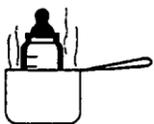
Unused Formula

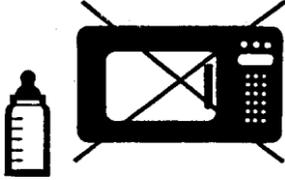
Formula left in the bottle after a feeding must be thrown away because it has become contaminated with the infant's saliva and provides an ideal breeding ground for bacteria. If formula is offered to an infant and the infant drinks it for five minutes and then stops, it should be thrown away after one hour if the infant doesn't continue to drink. Also, a dropped bottle whose nipple has come into contact with the floor or another unsanitary source should not be given to the infant.

If the parent or caregiver plans to take the infant on an "outing" (shopping, clinic appointment, etc.) it is important that proper care is taken with the infant's bottles that will be packed in the diaper bag. Prepared formula in bottles should start out very cold. The bottles should be insulated (ice packs) to keep them cold. If the parent or caregiver will not have access to refrigeration for a very long time, it is a good idea to use powder formula and wait to mix at the time of feeding.

Proper Feeding Temperature of Formula

Infants can be fed formula that is room temperature, slightly cooler, or slightly warmer. If an infant prefers a warm bottle, special care must be given not to warm the formula beyond body temperature. The best way to warm a bottle of infant formula is to place it in a pan or bowl of warm water for a few minutes or shake it under running warm tap water. A few drops of formula on the wrist is a good test of temperature: if it feels slightly warm on the wrist, it is the correct temperature for the infant.





DO NOT USE MICROWAVES TO WARM FORMULA OR BREASTMILK

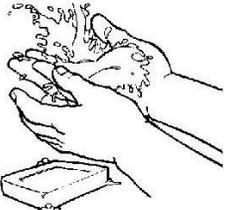
The following risks are too great and outweigh the convenience of using microwave ovens for heating infant formula or expressed breastmilk:

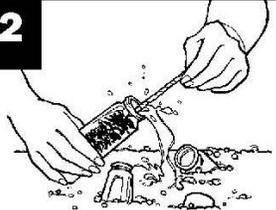
- After microwaving, glass or plastic bottles can remain cool to the touch while the formula or breastmilk inside them can be scalding hot. Microwaving also heats liquids unevenly. The formula or breastmilk may feel lukewarm to touch and will contain scalding hot spots.
- After microwaving, formula or breastmilk in bottles with disposable plastic liners can become so hot that the plastic liners may burst.
- The heat of the microwave oven can destroy antibodies in breastmilk. The correct way to warm breastmilk is to take the milk out of the refrigerator just before using. Gradually, over five to 10 minutes, warm the milk to room temperature in a container of warm water. To use frozen breastmilk—thaw the milk either in the refrigerator, where it can remain up to 24 hours, or in water just before feeding—gradually increase the temperature from cool to warm. Do not defrost the milk in a microwave or in a pan on the stove.

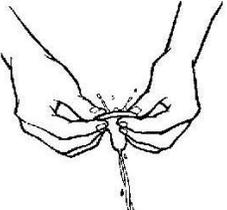
For additional information on formula types, preparation and storage, go to:

<http://www.nal.usda.gov/wicworks/Topics/FG/CompleteIFG.pdf>:
Infant Nutrition and Feeding A Guide for Use in the WIC and CSF Programs, Chapter 4, pages 89-99.

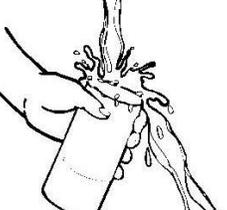
Preparation Checklist for Standard Ready-to-Feed Iron-Fortified Infant Formula (using glass or hard plastic bottles)

1  Wash your hands, arms, and under your nails, very well with soap and warm water. Rinse thoroughly. Clean and sanitize your workspace.

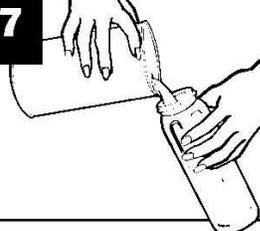
2  Wash bottles and nipples, using bottle and nipple brushes, and caps, rings, and preparation utensils in hot soapy water before using. Rinse thoroughly.

3  Squeeze clean water through nipple holes to be sure they are open.

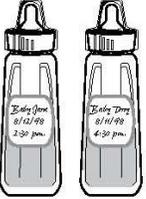
4  Put the bottles, nipples, caps, and rings in a pot and cover with water. Put the pot over heat, bring to a boil, and boil for 5 minutes. Remove with sanitized tongs, allow the items to cool, and air dry.

5  Wash the top of the can with soap and water and rinse well to remove dirt. Wash the can opener with soap and hot water.

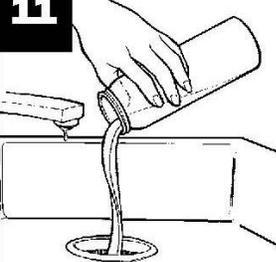
6  SHAKE CAN WELL and then open the can.

7  Pour the amount of ready-to-feed formula for one feeding into a clean bottle. Do not add water or any other liquid.

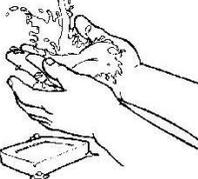
8  Attach nipple and cap and SHAKE WELL. Feed prepared formula immediately.

9  If more than one bottle is prepared, put a clean nipple right side up on each bottle and cover with a nipple cap. Label each bottle with the baby's name and the date and time that it was prepared.

10  Refrigerate until feeding time. Use within 48 hours. Do not leave formula at room temperature. To warm bottle, hold under running warm water. **Do not microwave bottles.** If formula is left in the can, cover and refrigerate open can until needed. Use within 48 hours.

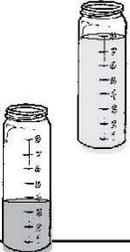
11  Throw out unused formula left in bottle after feeding or which has been unrefrigerated for 1 hour or more. Store unopened cans in a cool, dry indoor pantry shelf. Use before the expiration date.

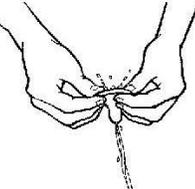
Preparation Checklist for Standard Liquid Concentrated Iron-Fortified Infant Formula (using glass or hard plastic bottles)

1  Wash your hands, arms, and under your nails, very well with soap and warm water. Rinse thoroughly. Clean and sanitize your workspace.

7  SHAKE CAN WELL and then open the can.

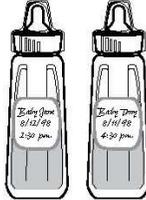
2  Wash bottles and nipples, using bottle and nipple brushes, and caps, rings, and preparation utensils in hot soapy water before using. Rinse thoroughly.

8  Pour needed amount of formula into a clean bottle using ounce markings to measure formula and add an equal amount of cooled boiled water. Thus, if 4 oz. of formula is poured into the bottle, 4 ounces of water should also be added.

3  Squeeze clean water through nipple holes to be sure they are open.

9  Attach nipple and ring to the bottle and SHAKE WELL. Feed prepared formula immediately. If formula is left in the can, cover and refrigerate can until needed. Use within 48 hours.

4  Put the bottles, nipples, caps, and rings in a pot and cover with water. Put the pot over heat, bring to a boil, and boil for 5 minutes. Remove with sanitized tongs, allow the items to cool, and air dry.

10  If more than one bottle is prepared, put a clean nipple right side up on each bottle and cover with a nipple cap. Label each bottle with the baby's name and the date and time that it was prepared.

5 For formula, bring water to a very bubbly boil. Keep boiling it for a minute or two, then let it cool. Use this water to mix the formula. Use water from a source approved by the local health department. If tap water is used for boiling, collect only cold tap water allowed to run for 2 minutes first.

 **BOIL**  **COOL**

 Refrigerate until feeding time. Use within 48 hours. Do not leave formula at room temperature. To warm bottle, hold under running warm water. **Do not microwave bottles.**

6  Wash the top of the can with soap and water and rinse well to remove dirt. Wash the can opener with soap and hot water.

12  Throw out unused formula left in bottle after feeding or which has been unrefrigerated for 1 hour or more. Store unopened cans in a cool, dry indoor pantry shelf. Use before the expiration date.

Preparation Checklist for Standard Powdered Iron-Fortified Infant Formula (using glass or hard plastic bottles)

1  Wash your hands, arms, and under your nails, very well with soap and warm water. Rinse thoroughly. Clean and sanitize your workspace.

8  Attach nipple and ring to the bottle and **SHAKE WELL**. Feed prepared formula immediately.

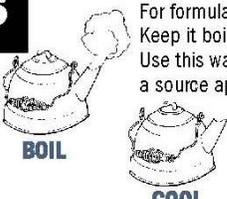
2  Wash bottles and nipples, using bottle and nipple brushes, and caps, rings, and preparation utensils in hot soapy water before using. Rinse thoroughly.

9  If more than one bottle is prepared, put a clean nipple right side up on each bottle and cover with a nipple cap. Label each bottle with the baby's name and the date and time that it was prepared.

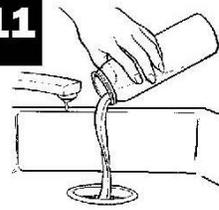
3  Squeeze clean water through nipple holes to be sure they are open.

10  Refrigerate until feeding time. Use within 24 hours. Do not leave formula at room temperature. To warm bottle, hold under running warm water. **Do not microwave bottles.**

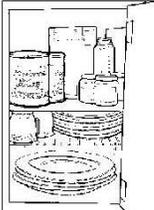
4  Put the bottles, nipples, caps, and rings in a pot and cover with water. Put the pot over heat, bring to a boil, and boil for 5 minutes. Remove with sanitized tongs, allow the items to cool, and air dry.

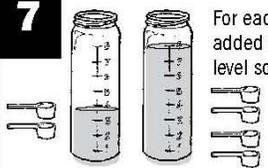
5  For formula, bring water to a very bubbly boil. Keep it boiling for a minute or two, then let it cool. Use this water to mix the formula. Use water from a source approved by the local health department. If tap water is used for boiling, collect only cold tap water allowed to run for 2 minutes first.

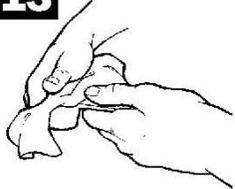
BOIL **COOL**

11  Throw out unused formula left in bottle after feeding or which has been unrefrigerated for 1 hour or more.

6  Remove plastic lid; wash lid with soap and clean water and dry it. Write date on outside of plastic lid. Wash the top of the can with soap and water, rinse well, and dry. Wash the can opener with soap and hot water. Open the can and remove scoop. Make sure that the scoop is totally dry before scooping out powdered formula. Only use the scoop that comes with the formula can.

12  Make sure that no water or other liquid gets into the can of powder. Cover opened can tightly and store in a cool dry place (not in the refrigerator). Use within 4 weeks after opening to assure freshness.

7  For each 2 ounces of cooled boiled water added to a clean bottle, carefully add 1 level scoop of powdered formula. Thus, if 8 ounces of water is poured into the bottle, 4 level scoops of formula should be added.

13  To be used again, the scoop should be washed with soap and hot water, rinsed thoroughly, and allowed to air dry. When making formula again, the scoop should be totally dry before using it to scoop powder out of the can. Store unopened cans in a cool, dry indoor pantry shelf. Use before the expiration date.

√ SELF-CHECK #2

1. Most formulas are packaged in three different forms: powder, concentrate, and ready-to-use. Briefly describe how to mix or dilute each one.

Powder:

Concentrate:

Ready-to-use:

Complete the sentences to make accurate statements in questions 2, 3, and 4.

2. Improper dilution of infant formula can result in _____.
3. Sterilization of water and bottles (until the infant is at least three months of age) and overall cleanliness during formula preparation is necessary in order to prevent _____.
- 4.
- a. Formula prepared from powder may be stored in the refrigerator for up to _____ hours after the formula has been mixed.
 - b. Formula prepared from concentrate may be stored in the refrigerator for up to _____ hours after the formula has been opened and mixed.
 - c. Ready-to-use formula may be stored in the refrigerator for up to _____ hours after the formula can has been opened.

Cow's Milk during the First Year



WIC and the American Academy of Pediatrics *strongly recommend that infants continue to be breastfed or receive an iron-fortified formula through the first year of life.* Fresh or powdered milk (whole, reduced-fat, lowfat, and skim), evaporated milk, sweetened condensed milk, and goat's milk are **not** recommended for infants during the first year of life.

Some of the reasons why cow's milk (whole, lowfat, skim, powdered) is **not** acceptable for infants before age one are:

- Cow's milk has a higher level of protein and minerals than breastmilk or iron-fortified infant formulas. This is not desirable for infants because the high levels of protein and minerals place stress on the kidneys of the young infant.
- The immature digestive system of the young infant is not able to adequately break down whole milk.
- In the early months, the feeding of fresh milk has been associated with gastrointestinal blood loss, which puts the infant at risk for the development of iron deficiency anemia. Also, cow's milk has been associated with allergy development.
- Fresh or powdered milk, evaporated milk, sweetened condensed milk, and goat's milk are poor sources of iron. Prolonged use in early infancy may result in iron deficiency anemia. These types of milk do not contain many essential nutrients such as vitamin C, some B vitamins, folate, and some minerals that are needed for growth and development of the infant.

Feeding Schedules



Newborn infants, whether breast or formula fed, need to be fed throughout the day and night. Young infants cannot drink a lot of breastmilk or infant formula at any one feeding and must have a supply throughout the day and night.

Infants differ in the age at which they are ready to sleep through the night without feedings. Some infants will sleep through the night at an early age, but will resume night feedings during periods of rapid growth or teething.



Most newborn infants lose weight the first few days of life. Usually they lose no more than 8% of their birth weight. That would mean that an 8-pound infant at birth might lose up to 10 ounces during the first few days of life. However, they should regain that weight within one week. Infants usually gain at least 5 ounces a week for the first six months of life.

Newborn Breastfed Infants

Newborn breastfed infants should be fed when they are hungry and should nurse until they are full. This is called feeding "on demand." Although there are several possible reasons for an infant crying, mothers and other caregivers of infants learn to identify crying due to hunger. When the infant's other needs are met, and crying is not a result of any obvious discomfort, the breastfed infant is most likely hungry. Feeding "on demand" will not spoil the breastfed infant.

Most breastfed infants will nurse every 1½ to three hours during the early weeks of life. Sleepy infants may need to be awakened to nurse. The amount of time between feedings increases as the baby grows older. Infants may nurse more during growth spurts, usually around two to three weeks, six weeks, and 12 weeks. Feedings can be expected to last 20 to 30 minutes. Growth spurts generally last two to three days.

Breastfed infants who receive supplemental formula have different feeding patterns. Refer to the refer to the **WIC Competency Based Training Module Level II - Breastfeeding Competency Based Training for CPAs** on A-Train for more detailed information on breastfeeding.



Newborn Formula Fed Infants

The quantity of formula an infant consumes in 24 hours will vary greatly, depending on the infant's age, size, level of activity, and if it is a supplement to breastmilk. Infants should be fed formula as they need it ("on demand") with special instructions to the parent or caregiver to watch for the first signs of fullness (decrease in sucking, lack of interest in the feeding, etc) to prevent overfeeding. Encourage parents and caregivers to let the baby decide how much to eat. Discard any formula remaining in the bottle. Do not force the infant to finish the bottle.

Infants do not always get hungry on a schedule and do not always take the same amount at a feeding. Let the baby decide how much to eat. A general rule for how much formula in a day a healthy full term infant should drink is on average 2.5 ounces per pound of body weight. For example an 8 pound healthy full term newborn would be expected to drink approximately 20 ounces of formula in a 24 hours period. However, parents and caregivers should pay attention to the infant's hunger and satiety cues.



Recognizing Hunger and Satiety

Some early hunger cues include sucking on the lips, fingers, and fist; smacking the lip and sucking on the tongue. Active hunger cues include rooting (looking for a nipple), fidgeting, and fussing. Late hunger cues include furrowing the brow, moving the head frantically from side-to-side and crying.

Signs of satiety and fullness are when the infant:

- ☺ ends the feeding by releasing the breast;
- ☺ seals the lips together;
- ☺ seems content and calm;
- ☺ more interested in other things going on around the infant;
- ☺ falls soundly asleep;
- ☺ hands, toes, legs and arms open and become limp.

Encourage parents and caregivers to be flexible and responsive to the baby's signs of hunger before he reaches the late stage of crying. Suggest parents and caregivers talk with their health care provider if they have concerns about growth.

Signs of Adequate Intake

During the first few days of life, wet and dirty diapers gradually increase. Breastfed and formula fed infants should have at least six wet diapers a day by the third day of life. The urine should be clear. Breastfed infants should have ≥ 2 soft stools by the third day whereas formula fed infants do not stool as frequent or have as soft a stool. After about six weeks of age, the older infant may stool less frequently.

√ SELF-CHECK #3

1. Which of the following types of milk are recommended to feed an infant during the first year of life?

Iron-fortified formula	Sweetened condensed milk
Fresh whole milk	Goat's milk
Reduced-fat, lowfat or skim milk	Breastmilk

2. True or False

- a. Feeding "on demand" will spoil a breastfed infant.
- b. To prevent overfeeding, a parent or caregiver should look for signs of satiety and fullness such as sealing the lips together, more interested in other things going on or hands, toes, legs, and arms open and become limp.
- c. Infants differ in the age at which they are ready to sleep through the night without feedings.
- d. Fresh and powdered milk (whole, reduced fat, lowfat, or skim) are good sources of iron for older infants.

Use of Bottles

Bottles are appropriate for feeding infants who are not developmentally ready to drink from a cup. However, bottles must be used properly.



What—and What Not—to Put into a Bottle

There are only three items that should be fed from a bottle:

- ☺ Infant formula
- ☺ Breastmilk which has been "expressed" or removed from the breast by hand techniques or by use of a breast pump
- ☺ Water, but not given routinely: Human milk and infant formula provide infants with enough water. Supplemental water generally is not indicated for healthy infants who are not receiving complementary foods. Discourage parents from routinely using water as a supplement for infants less than six months of age. Infants with diarrhea or vomiting should be referred to their health care provider who will likely recommend an oral rehydration solution rather than plain water.

There are many items that should never be fed from a bottle:

- ✗ Cereals and pureed foods: Complementary foods should not be fed until the infant is developmentally ready to take these foods from a spoon. Feeding solids from a bottle will not help the baby sleep through the night and may lead to overfeeding. Also, feeding infant cereal in a bottle or "infant feeder" can cause choking.
- ✗ Juices: Juice should be introduced when the baby is developmentally ready to drink juice from a cup (usually occurs around six to seven months of age). Feeding juice from a bottle may lead to tooth decay and over-consumption of juice. When offering juice in a cup, give only one to two ounces a day.
- ✗ Sweeteners: Adding sweeteners of any kind including honey, corn syrup, sugar, Kool-Aid, or "gelatin water" to the bottle is inappropriate. These sweeteners can result in excessive caloric intake and tooth decay.
- ✗ In addition, honey and corn syrup may contain botulinum spores that are responsible for the very serious food poisoning— **botulism**. *Botulism can cause severe illness and death in infants*. Thus, honey and corn syrup should not be given to an infant under one year of age.

Making Baby Comfortable When Formula Feeding



There are proper ways to hold the bottle while feeding an infant in your arms. The bottle should be tilted so that the neck and nipple are always filled with formula. This will help prevent the infant from swallowing air. Swallowed air can lead to a decrease in formula intake because the infant will feel full early in the feeding. It also can cause discomfort for the infant. *Infants should be burped during and after feedings to release swallowed air. This is true for both breastfed and bottle fed infants.*

Crying or fussiness is not always an indication of hunger. Help parents and caregivers to understand that breastfeeding or bottle feeding should not be used as a substitute for an infant's other needs. Holding and rocking the infant, changing the infant's diapers, or offering a pacifier when the parent is certain the infant isn't hungry is often adequate to soothe an infant.

Propped Bottles Lead to Problems

An infant who is bottle fed should always be held during feeding. Holding, touching, and establishing good eye contact increases bonding between the parent or caregiver and infant and enables the parent or caregiver to learn the infant's hunger and fullness cues. Older infants may prefer to hold the bottle themselves while in the parent's or caregiver's arms or lap or while sitting in a high chair or similar chair.

Strongly discourage the practice of propping the bottle. Parents or caregivers will often do this to give themselves the opportunity to do other things. "Bottle propping" is not a safe practice. The infant may choke on the liquid and the fluid can get into the lungs. Furthermore, health care professionals believe that infants who are fed while lying back without their heads being raised a little have a greater incidence of middle ear infections. Parents or caregivers are not engaged with their infant when they prop the bottle and therefore cannot respond to their infant's needs, for example, if the infant wants to stop feeding.

Infants need to be held as part of their development and feeding time is a good time for holding!!!



Complementary Foods

Complementary foods are foods other than breastmilk or infant formula (liquids, semisolids, and solids) introduced to an infant to provide nutrients. Recommendations on the introduction of complementary foods provided to caregivers of infants should take into account:

- The infant's developmental stage and nutritional status;
- Coexisting medical conditions;
- Social factors;
- Cultural, ethnic, and religious food preferences of the family;
- Financial considerations, and
- Other pertinent factors discovered through the nutrition assessment process

Transitioning to Complementary Foods



The ideal time to introduce complementary foods in the diets of infants is difficult to pinpoint. Complementary foods introduced too early are of little benefit to the infant and may even be harmful due to the possibility of choking, developing food allergies, or causing an infant to consume less than the appropriate amount of breastmilk or infant formula. Introducing complementary foods too late may cause an infant to develop nutritional deficiencies and/or miss that period of developmental readiness. Consequently, the infant may have difficulties learning to eat complementary foods when they are introduced later. When complementary foods are introduced appropriate to the developmental stage of the infant, nutritional requirements can be met and eating and self-feeding skills can develop properly.

The following table, *Sequence of Development and Feeding Skills in Healthy, Full term Infants*, summarizes the development of an infant's mouth, hand, and body skills and how these skills correspond with an infant's ability to consume different complementary foods. Recognizing these skills is important for assessing when certain types and textures of foods should be introduced at certain stages of an infant's development. *All infants who appear to be having feeding problems should be referred to a health care provider for assessment.*

Sequence of Development and Feeding Skills in Healthy, Full Term Infants

Infant's Approximate Age	Mouth Patterns	Hand and Body Skills	Feeding Skills or Abilities	Hunger and Satiety (Fullness) Cues
Birth through 5 months	<ul style="list-style-type: none"> - Suck/swallow reflex - Tongue thrust reflex - Rooting reflex - Gag reflex 	<ul style="list-style-type: none"> - Poor control of head, neck, trunk - Needs head support - Brings hands to mouth around 3 months 	<ul style="list-style-type: none"> - Swallows liquids but pushes most solid objects from the mouth - Coordinates suck-swallow-breathe while breast or bottle feeding - Moves tongue forward and back to suck 	<p>Hunger cues:</p> <ul style="list-style-type: none"> - Wakes and tosses - Sucks on fist - Cries or fusses - Opens mouth while feeding to indicate wanting more <p>Satiety cues:</p> <ul style="list-style-type: none"> - Seals lips together - Turns head away - Decreases or stops sucking - Spits out the nipple or falls asleep when full
4 months through 6 months	<ul style="list-style-type: none"> - Up-and-down munching movement - Transfers food from front to back of tongue to swallow - Draws in upper or lower lip as spoon is remove from mouth - Tongue thrust and rooting reflexes begin to disappear - Gag reflex diminishes - Opens mouth when sees spoon approaching 	<ul style="list-style-type: none"> - Sits with support - Good head control - Uses whole hand to grasp objects (palmer grasp) - Recognizes spoon and holds mouth open as spoon approaches 	<ul style="list-style-type: none"> - Takes in a spoonful of pureed or strained food and swallows without choking - Drinks small amounts from cup when held by another person, with spilling 	<p>Hunger cues:</p> <ul style="list-style-type: none"> - Cries or fusses - Smiles, gazes at caregiver, or coos during feeding to indicate wanting more - Moves head toward spoon or tries to swipe food towards mouth <p>Satiety cues:</p> <ul style="list-style-type: none"> - Decreases rate of sucking or stops sucking when full - Spits out the nipple - Turns head away - May be distracted or pay attention to surroundings more
5 months through 9 months	<ul style="list-style-type: none"> - Begins to control the position of food in the mouth - Up-and-down munching movement - Positions food between jaws for chewing 	<ul style="list-style-type: none"> - Begins to sit alone unsupported - Follows food with eyes - Transfers food from one hand to the other - Tries to grasp foods such as toast, crackers, and teething biscuits with all fingers and pull them into the palm. 	<ul style="list-style-type: none"> - Begins to eat mashed foods - Eats from a spoon easily - Drinks from a cup with some spilling - Begins to feed self with hands 	<p>Hunger cues:</p> <ul style="list-style-type: none"> - Reaches for spoon or food - Points to food <p>Satiety cues:</p> <ul style="list-style-type: none"> - Eating slows down - Clenches mouth shut or pushes food away
8 months through 11 months	<ul style="list-style-type: none"> - Moves food from side to side in mouth - Begins to use jaw and tongue to mash food - Begins to curve lips around rim of cup - Begins to chew in rotary pattern (diagonal movement of the jaw as food is moved to the side or center of the mouth) 	<ul style="list-style-type: none"> - Sits alone easily - Transfers objects from hand to mouth - Begins to use thumb and index finger to pick up objects (pincer grasp) - Feeds self finger foods - Plays with spoon at meal-times, but does not spoon-feed yet 	<ul style="list-style-type: none"> - Begins to eat ground or finely chopped food and small pieces of soft food - Begins to experiment with spoon but prefers to feed self with hands - Drinks from a cup with less spilling 	<p>Hunger cues:</p> <ul style="list-style-type: none"> - Reaches for food - Points to food - Gets excited when food is presented <p>Satiety cues:</p> <ul style="list-style-type: none"> - Eating slows down - Pushes food away
10 months through 12 months	<ul style="list-style-type: none"> - Rotary chewing (diagonal movement of the jaw as food is moved to the side or center of the mouth) 	<ul style="list-style-type: none"> - Feeds self easily with fingers - Begins to put spoon in mouth - Dips spoon in food rather than scooping - Demands to spoon-feed self - Begins to hold cup with two hands - Drinks from a straw - Good eye-hand-mouth coordination 	<ul style="list-style-type: none"> - Begins to eat chopped food and small pieces of soft, cooked table food - Begins spoon-feeding self with help - Bites through a variety of textures 	<p>Hunger cues:</p> <ul style="list-style-type: none"> - Expresses desire for specific food with words or sounds <p>Satiety cues:</p> <ul style="list-style-type: none"> - Shakes head to say "no more"

*Developmental stages may vary with individual infants.

Adapted from *Infant Nutrition and Feeding: A Guide for Use in the WIC and CSF Programs*; March 2009



From 4 to 6 months of age, the following developmental changes occur that allow the infant to tolerate complementary foods:

- Intestinal tract develops immunologically, thus, the risk of allergic reactions to the proteins in complementary foods is reduced
- Ability to digest and absorb proteins, fats, and carbohydrates, other than those in breastmilk and formulas is increased
- Kidneys develop the ability to excrete waste products from foods with high renal solute load, such as meat
- Developed neuromuscular mechanisms needed for recognizing and accepting a spoon, masticating, swallowing nonliquid foods, and appreciating variation in the taste and color of foods

Some developmental milestones an infant reaches when he/she is ready to consume complementary foods include:

- Sit up, alone or with support
- Hold his head steady and straight
- Open his mouth when he sees food coming
- Keep his tongue low and flat to receive the spoon
- Close his lips over a spoon and scrape food off as a spoon is removed from his mouth and
- Keep food in his mouth and swallow it rather than pushing it back out on his chin. By 4 to 6 months of age, the infant's tongue thrust reflex, which causes the tongue to push most solid objects out of the mouth, usually disappears.

Pediatric nutrition authorities agree that complementary foods should not be introduced to infants before they are developmentally ready for them; this readiness occurs in most infants between 4 and 6 months of age. The American Academy of Pediatrics agrees that there is no evidence that shows there is harm when safe nutritious complementary foods are introduced after 4 months of age when the infant is developmentally ready. Few studies show significant benefit for delaying complementary foods until 6 months of age. The timing of introduction of complementary foods for an individual infant may differ from this recommendation. There is some disagreement among authorities on the need for additional sources of nutrients besides breastmilk in the first 6 months. However, there is agreement that infants need a good dietary source of iron and zinc by about 6 months of age, which cannot be met by breastmilk or formula alone.

Note: WIC infants do not receive complementary foods (infant cereals, fruits, vegetables and meats) on their WIC check until they are six months of age.

√ SELF-CHECK #4

1. Name the three items that are appropriate to put in an infant's bottle.
 - a.
 - b.
 - c.

2. Name at least three items that should not be put in an infant's bottle.
 - a.
 - b.
 - c.

3. True or False
 - a. Feeding juice from a bottle may lead to tooth decay.
 - b. Feeding honey or corn syrup to an infant less than one year of age can cause botulism food poisoning.
 - c. "Bottle propping" is a good way to feed an infant because it frees up the caregiver to do other things.
 - d. Only bottle fed infants need to be burped during feedings.

4. Fill in the blanks to complete the sentences accurately:
 - a. When complementary foods are introduced _____ of the infant, nutritional requirements can be met and eating and self-feeding skills can develop properly.
 - b. Infants need a good dietary source of ____ and ____ by about 6 months of age.

5. Which of the following statements are indicators of an infant's readiness to start the introduction of complementary foods?
 - a. Ability to sleep through the night.
 - b. Ability of the tongue and swallowing mechanism to deal with non-liquids.
 - c. Ability of the infant to sit up, alone or with support
 - d. The infant has at least two teeth.
 - e. Opens his mouth when he sees food coming.

Iron Needs during Infancy



Iron is vital throughout life, but is especially important during infancy and childhood when growth is rapid. Iron is a vital component of hemoglobin, the part of red blood cells that carries oxygen to all parts of the body. Adequate oxygen is necessary for normal growth.

Healthy full term infants are born with a supply of iron that supplies their iron needs until approximately four to six months of age. However, between four and six months of age the supply becomes depleted and iron must be supplied by the infant's diet. Breastmilk contains a form of iron that is well absorbed and utilized by infants and therefore is considered a good source of iron. For those infants not breastfed, iron-fortified infant formula is an excellent source of iron for infants as well.

Iron-fortified infant cereals are an excellent solid food source of iron for both breastfed and formula fed infants. Since they are also easy for a young infant to eat and digest, infant cereals make an excellent choice for the first complementary food feeding. *Even after other complementary foods have been introduced, iron-fortified infant cereals remain a good food source of iron for infants through their first year.*

Complementary foods that supply iron for an infant over six months of age are:

- meats – ground or minced meat from the family table or commercially strained
- cooked dried beans and peas – pureed or mashed
- egg yolks

The iron in meats (heme iron) is readily absorbed in the body. Iron in non-meat sources (non-heme iron) is not as easily absorbed by the body. To enhance the absorption of iron from non-meat sources, parents and caregivers can offer a vitamin C-rich food (such as vitamin C-enriched juice or a fruit or vegetable high in Vitamin C); or a meat source at the same meal. For example, serving vitamin C-enriched apple juice along with iron-rich infant cereal causes the iron in the cereal to become more available to the body.

Poor Iron Sources:

- Fruits, most vegetables, and commercial baby food dinners provide very small amounts of iron in an infant's diet and are not considered good sources of iron.
- The use of tea should be discouraged because it also can inhibit iron absorption.

- Also, remember that fresh or powdered cow's and goat's milk (which should not be fed to infants under one year of age) are a poor source of iron.



Sequence of Complementary Food Introduction

Research does not support introducing foods in a particular order; however, it is recommended to introduce one “single-ingredient” new food at a time. See *Guidelines for Feeding Healthy Infants, Birth to 1 Year Old* chart on the following pages.

Iron-fortified Infant Cereals

Iron-fortified cereal is an appropriate first complementary food for infants because it is easy to digest and contributes important nutrients such as iron and zinc to the diet. Iron stores of full term infants can meet an infant's needs until age four to six months. Infant cereal can be introduced between four and six months of age. Infant cereal has additional iron to meet the rapidly growing needs of the infant. It is important to note that the manufacturers of infant cereal add a form of iron to the infant cereals that is better absorbed by the infant's body. Thus, only infant cereals should be given. Iron-fortified cereals not specifically made for infants do not generally contain a form of iron that is more easily absorbed by the infant's body. In addition, infant cereals provide a smooth texture and can be varied in thickness to help the infant adjust to the new eating experience.

Rice cereal is recommended as the first cereal choice because it is a single grain, digests easily, contains important nutrients and is least likely to cause an allergic reaction. Wait five to seven days before introducing a new cereal, even if it appears to be well tolerated.

Barley and oatmeal are good choices after rice has been started. High protein and mixed cereals should not be offered until the infant is around eight months old because they are more likely to cause an allergic reaction when introduced at an earlier age.

Dry infant cereals are less expensive than jars of prepared cereals. Jar infant cereal usually includes multiple ingredients, sugar, and calories. Dry infant cereals can be mixed with breastmilk, infant formula, or water, to prepare it to the appropriate consistency. The WIC infant food package only allows for dry single grain infant cereals (rice, oatmeal, barley).

Iron and Zinc Needs for Exclusively Breastfed Infants

Iron and zinc are essential nutrients for all healthy, full term infants, but are special nutrients of concern for exclusively breastfed infants. Research has shown that at 6 through 11 months postpartum, the zinc and iron content of breastmilk alone is not sufficient for older breastfeeding infants. The timing of introduction, content, and bio-availability of zinc and iron in complementary foods, such as protein-rich foods and fortified infant cereal, is very important for exclusively breastfed infants.

Avoiding Food Allergies

Once complementary foods are introduced in an infant's diet, only one new food at a time should be given. The new food should be fed for five to seven days prior to the introduction of another new food. If sensitivity to the food such as skin rash, diarrhea, hives, or vomiting is exhibited, the food can be readily identified and eliminated from the diet until a later date when the food can be reintroduced.

Guidelines for Feeding Healthy Infants, Birth to 1 Year Old

(Note: These are general guidelines for the healthy, full term infant per day; serving sizes may vary with individual infants.)

Age	Breastmilk or Infant Formula	Grain Products	Juices	Vegetables	Fruits	Protein-Rich Foods
Birth - 4 Months	Breast: 8 -12+ feedings Iron-Fortified Infant formula: 14 - 42 ounces (~108 kcal/kg body weight)	NONE				
4 -6 Months	Breast: 5 or more feedings Iron-Fortified Infant formula: 26 - 39 ounces (~108 kcal/kg body weight)	Iron fortified infant cereals (1 - 2 Tbsp)	NONE	Plain strained or pureed cooked vegetables (1 - 2 Tbsp)	Plain strained or pureed fresh or cooked fruits (1 - 2 Tbsp)	Plain strained or pureed protein-rich foods such as meats, egg yolk, and legumes may be introduced if an additional food source of iron is needed
		The American Academy of Pediatrics (AAP) Section on Breastfeeding recommends exclusive breastfeeding for the first 6 months of life. The AAP Committee on Nutrition recommends that, in developed countries, complementary foods may be introduced between ages 4 and 6 months. This is a population-based recommendation, and the timing of introduction of complementary foods for an individual infant may differ from this recommendation.				
6 – 8 Months	Breast: 3 - 5 feedings Iron-Fortified Infant Formula: 24 - 32 ounces (~98 kcal/kg body weight)	Iron fortified infant cereals or enriched hot cereals (4 - 6 Tbsp) Dry toast, small pieces of crackers, or dry breakfast cereals (4 - 6 Tbsp)	100 percent pasteurized fruit or vegetable juice 4 to 6 ounces per day, only from a cup	Plain strained or pureed cooked vegetables (3 - 4 Tbsp)	Plain strained or pureed fresh or cooked fruits (3 - 4 Tbsp)	Plain strained or pureed protein-rich foods such as meats, egg yolk, and legumes (1 - 2 Tbsp)
8 -12 Months	Breast: 3 - 4 feedings Iron-Fortified Infant Formula: 24 - 32 ounces (~98 kcal/kg body weight)	Iron-fortified infant cereals or enriched hot cereals (4 - 6 Tbsp) Dry toast, small pieces of crackers, or dry breakfast cereals and other grain products (4 - 6 Tbsp)	100 percent pasteurized fruit or vegetable juice 4 to 6 ounces per day, only from a cup	Plain pureed, mashed, or chopped cooked vegetables (3 - 4 Tbsp)	Plain pureed, mashed, or chopped cooked fruits (3 - 4 Tbsp)	Pureed or chopped lean meat, poultry, fish, egg yolk, cheese, yogurt, or mashed legumes (1 - 3 Tbsp)
Comments	<ul style="list-style-type: none"> • By about 12 to 14 months, try to wean entirely off the bottle and onto a cup. • An infant’s health care provider may recommend feeding a small amount of sterile water (~ 4 to 8 oz per day) in a cup when complementary foods are introduced. 	<ul style="list-style-type: none"> • Examples of other grain products include zwieback, bread, noodles, mashed rice, corn grits, and soft tortilla pieces. • Avoid wheat cereals until 8 months. • Do not add sugar or syrups to cereal. • Never add honey to cereal or any foods. • Avoid foods that may cause choking. 	<ul style="list-style-type: none"> • Avoid feeding soda, fruit punches, ades, and drinks, gelatin water, coffee, or tea. 	<ul style="list-style-type: none"> • It is not necessary to add salt, sugar, oil, butter, other fats, or seasonings. • Avoid foods that may cause choking. 	<ul style="list-style-type: none"> • Do not add sugar or syrups to fruits. • Never add honey to fruit or any foods. • Remove seeds and pits from fruits. • Avoid foods that may cause choking 	<ul style="list-style-type: none"> • Avoid fried meats, gravies, sauces, processed meats (e.g., hot dogs, luncheon meats, bacon, and sausage). • Check carefully for bones (especially in fish). • Do not feed any shellfish, peanut butter, whole eggs, or egg whites before 1 year of age. • Avoid foods that may cause choking.

Adapted from: *Infant Nutrition and Feeding: A Guide for Use in the WIC and CSF Programs March 2009*



The First Feedings with Cereal

Mix dry infant cereals with breastmilk or infant formula. Start with a teaspoon of cereal mixed with the liquid in a small dish to form a very thin cereal. Offer the cereal one or two times a day. As the infant gets used to eating cereal, larger portions can be offered, and the cereal can be made thicker. Serve infant cereal plain, without added sugar or sweeteners.

During the first feedings, it may appear that the infant is trying to push the cereal out of his mouth. This does not necessarily mean that he does not like it. It takes time for the infant to learn to use his tongue to move food to the back of the mouth to swallow. If he becomes very upset and refuses to eat the cereal at the first feeding, do not force it, but offer it again at another time. Infants are developing their sense of trust in the world and depend on the parent or caregiver to read their reactions.

Vegetables and Fruits

Vegetables and fruits provide infants with carbohydrates, including fiber; vitamins A and C; and minerals. The order of the introduction of these two is not important. A wide variety of vegetables and fruits should be introduced over time. The recommendations to introduce one single-ingredient new food at a time, wait 7 days between each new food, and watch the infant closely for adverse reactions, still apply.



If commercially prepared vegetable or fruit infant foods are used, plain varieties are generally preferred instead of fruit desserts or infant food mixtures with added ingredients such as sugar, nonfat dry milk, or corn syrup. Plain vegetables and fruits generally offer more nutrient value for the cost of the food compared to fruit desserts and infant food mixtures. Commercially prepared fruit and vegetable infant foods that progress in texture can be used as the infant's developmental abilities advance.

The American Academy of Pediatrics (AAP) recommends that spinach, beets, turnips, carrots, or collard greens prepared at home should not be fed to infants less than 6 months old because they many contain sufficient nitrate to cause methemoglobinemia or "blue baby" syndrome. This condition is characterized by blue skin and difficulty in breathing and could lead to death. The potential risk of developing methemoglobinemia is only present with home-prepared high-nitrate vegetables; commercially prepared infant and junior spinach, carrots, and beets contain only traces of nitrate and are not considered a risk to the infant.



Protein-rich Foods

Protein-rich foods are generally introduced to infants between 6 and 8 months of age. If an additional source of iron or zinc is needed and the infant is developmentally ready, protein-rich foods may be introduced between 4 and 6 months of age. Iron and zinc are nutrients of concern for exclusively breastfed infants and should be considered when caregivers determine a time to introduce protein-rich foods. Protein-rich foods include meat, poultry, fish egg yolks, cheese, yogurt and legumes. Home-or commercially prepared meats are a good source of iron and zinc, in addition to iron-fortified infant cereal. Introduction of protein-rich foods earlier than 6 months of age may cause allergic reactions. For the infant over 6 months of age, as with all new foods, protein-rich foods should be introduced one at a time, waiting 7 days between exposing each new food, while observing the infant closely for reactions to the foods.

Plain strained chicken, turkey, lamb, beef, and veal are suggested meats to serve. Also, when new meat is given, it should be single meat, instead of a combination dinner. Plain commercially prepared infant food meats offer more nutrient value, ounce for ounce, compared to commercially prepared infant food mixed dinners. Instead of using mixed dinners, the desired amounts of plain meats and plain vegetables could be mixed together. Some infants will accept meat better when it is mixed with another food.

Egg yolks are also an excellent source of protein and may be offered to the infant. The yolk of the egg may be hard cooked and then mixed with cereal or other food. *Whole eggs should not be fed to an infant less than one year of age because the egg white contains a variety of proteins that may cause an allergic reaction.*

Cottage cheese, hard cheeses, and yogurt can be gradually introduced as occasional protein foods. Since these foods contain similar proteins to cow's milk, infants should be observed closely for reactions after eating these foods.

Cooked dried beans and peas or tofu can be introduced into an infants' diet as a protein food.

After a variety of plain strained vegetables, fruits, and meats have been introduced, begin to add more textures with foods, such as coarsely chopped cooked vegetables. Use plain, unseasoned table foods and modify the texture by hand chopping or using an infant food grinder.



Fruit Juices – Limited Use

The AAP has concluded that fruit juice offers no nutritional benefit for infants less than 6 months of age and no benefit over whole fruits for infants older than 6 months of age. However, 100 percent fruit juice or reconstituted juice can be consumed as part of a well-balanced diet.

Fruit juices should only be offered when an infant can drink from a cup with assistance, which is usually around six to eight months of age. It should not be given to infants before six months of age. Infants should be given juice from bottles or from spill-proof cups (sippy cups) that allow them to consume juice easily throughout the day.

When introducing juice, the single 100% fruit juice varieties should be offered. Introduce new fruit juices one at a time and not sooner than about 7 days apart, and observe for any adverse reactions. Mixed juices can be offered after the infant has tried all the juices in the mixture. Fruit drinks, artificially colored and flavored drinks, sweetened drinks, tea, "gelatin water," and colas or other sodas, should not be offered to infants.

Some additional points about feeding fruit juices to infants include:

- The older infant needs only two to three ounces of juice daily. Do not give more than two to three ounces of juice a day because too much may give the infant a feeling of fullness and, therefore, other important foods may not be eaten. Too much juice may also cause stomach upset, diarrhea, tooth decay.
- Avoid offering fruit juice at nap or bedtime.
- Never feed infants unpasteurized juice due to the risk of the infant being exposed to *Escherichia coli* O157: H7.

Appropriate Infant Feeding Practices



Feeding practices influence infant health and lifelong eating habits. Any of the following practices can be recommended during a WIC visit throughout the infant's first year of life.

- ✓ Feed infants in a high chair or secured in a safe chair. Another good position is to seat the infant upright on the parent or caregiver's lap. This helps to make the infant feel secure about this new feeding experience. The caregiver and infant should have good eye contact so that they can readily see each other. Always check the infant to make sure the food is being swallowed easily.
- ✓ Feed infants complementary foods from a spoon. Spoon feeding is an important part of developing the ability to self-feed. It also

promotes the proper development of tongue muscles that are important for speech and allows the infant to experience the taste and texture of foods. There are several inexpensive feeding utensils especially designed for infant feeding. Long-handled spoons with small shallow bowls and infant cups with handles and weighted bottoms make feeding easier for the infant and caregiver.



- ✓ Introduce each new food one at a time with approximately five to seven days in between new items. This allows the infant to become accustomed to new foods. It will also provide an opportunity for parents and caregivers to readily identify if any one food causes an adverse reaction such as rash, hives, vomiting, diarrhea, or respiratory problems. In the case of an adverse reaction, eliminate the food from the diet and reintroduce at a later date.
- ✓ Introduce new foods when the baby is feeling good and hungry, but not overly hungry.
- ✓ Start new foods in small quantities—one to two teaspoons--and slowly increase to a tablespoon or more.
- ✓ Wait for the infant to open her mouth before trying to feed her. Feed as slowly or as fast as she wants to eat. Let her touch the food.
- ✓ Wash baby food jars before opening. Jar lids should make a popping sound when opened. The popping indicates the product was safely processed and stored. If the "bubble" on the top of the jar has already popped up, the food in that jar should not be fed to the infant. Do not feed directly from the jar – portion out small amounts into a bowl with a clean spoon to avoid contaminating the food in the jar.
- ✓ Do not force new foods that are rejected by an infant, but rather offer them at another time. Infants will generally learn to accept most new foods if they are offered repeatedly. Let infants set the pace for feeding. Wait until the infant indicates he is ready for another spoonful.
- ✓ Parents and caregivers can encourage acceptance of new foods by demonstrating a positive attitude about them. Infants will not necessarily refuse foods that other family members do not like. Infants who are exposed to more foods are more likely to enjoy a greater variety of foods as an adult.
- ✓ It is not necessary for an infant to finish a bottle or complementary foods. The infant is usually the best judge of how much to eat. Pay attention to their signals. Overfeeding or forcing an infant to eat may lead to an overweight infant or to habits that may eventually cause obesity.

√ SELF-CHECK #5

1. Which foods would be most appropriate for a six to eight-month-old infant?

Iron-fortified infant cereal	Strained fruit	Strained beef
Banana/apple dessert	Egg yolk	Apple juice
Strained vegetable	Whole egg	Chicken noodle dinner

2. Which items are good sources of iron for the infant?

Iron-fortified formula	Fortified infant cereal
Strained meats	Strained fruits
Fresh whole milk	Cooked dried beans–mashed
Breastmilk	

3. Fill in the blank to accurately complete the statement.
 Feeding a _____-enriched food at the same time that the iron-rich food is fed can increase iron absorption by the body.

4. True or False
 - a. Infants need four ounces of juice daily.
 - b. Introduce new foods to infants when they aren't overly hungry and are feeling good.
 - c. Forcing an infant to eat may lead to habits that may cause obesity later in life.

Dental Health



The primary or "baby" teeth begin to form in the jaw before birth and they continue to develop throughout the first years of life. Good nutrition during pregnancy and infancy helps to form teeth that are strong and healthy.

Several nutrients are necessary for the development of healthy teeth, but the most important ones are **protein, calcium, phosphorus, and fluoride**. Teeth will form with calcium and phosphorus, but will be stronger and more resistant to decay if fluoride is a part of them. For this reason, many communities add fluoride to the water supply if it is not present naturally. Refer parents and caregivers to their local water treatment plant to learn if the community water supply has adequate fluoride or the Office of Oral Health with the State Department of Health.

If prescribed by a physician, fluoride supplements can be given. Recommended fluoride supplementation depends on the total amount of fluoride available to the infant from all sources, including infant formula, water, and commercially and home-prepared infant foods. *The American Academy of Pediatrics (AAP), the American Academy of Pediatric Dentistry (AAPD), and the CDC recommend no fluoride supplementation for infants less than 6 months old. For infants older than 6 months, whose community drinking water contains <0.3 ppm fluoride, supplementation of 0.25 mg sodium fluoride/day is recommended.* Parents should give only the amount of fluoride prescribed. Too much fluoride over a period of time can cause staining of the teeth called **mottling**.

Caries = cavities = tooth decay



Dental Caries

Dental caries are caused by bacteria called *Streptococcus mutans* (*S. mutans*). People who do not practice good dental health habits have a large amount of these bacteria in their mouths and are more likely to spread it to others. Infants do not have the bacteria when they are born, but they can get it from others. The presence of this bacteria, combined with improper feeding of infant formula, milk, juice, or sweetened drink increases the chances of early childhood caries occurring.

Evidence indicates that the primary source of *S. mutans* in the mouth of infants is their mother's saliva. *S. mutans* is spread from mother to infant or child by sharing eating utensils; toothbrushes; putting things from an adult's mouth into the infant's mouth (such as the pacifier being cleaned in the parent's mouth first or pre-chewing foods for the infant) and increases

the risk of the child developing dental caries, especially if the mother has untreated dental caries. These practices should be strongly discouraged.

Sugar- a fermentable carbohydrate - is a natural ingredient in all milks including breastmilk, cow's milk and infant formula. Juices, Kool-Aid, and other drinks also contain natural or added sugars. The sugar in these liquids is used by the *S. mutans* bacteria in the infant's mouth and acid is formed. The acid attacks the teeth causing decay. The upper front teeth are usually the most affected in infants and these sometimes fall out or need to be pulled or capped when decay is excessive.



Early Childhood Caries

Early childhood caries – formerly called nursing bottle caries or baby bottle tooth decay- is a specific form of severe tooth decay of an infant's primary teeth. These caries are characterized by the following features:

- Begin soon after tooth eruption
- Progress rapidly
- Decay occurs on smooth surfaces, generally considered to be at low risk of decay
- Have a lasting harmful affect on dentition throughout childhood.

Early childhood caries develop when bacteria are present and an infant's teeth are bathed in liquids containing fermentable carbohydrates for prolonged periods of time during the day or night. This is why taking a bottle (with anything but water) to bed should be discouraged.

Care of the Gums and Teeth

The primary teeth usually begin to appear near the age of six months and are subject to decay from the time they first appear. Therefore, care of the gums and teeth should begin in early infancy.



Preventing Early Childhood Caries

- ✓ Good dental health, including daily cleaning of the gums and teeth, should be started early in life. Before teeth appear, parents can clean the infant's gums from the first day of life. Wipe out the mouth gently and massage the gums with a clean damp cloth or gauze after feedings or at least twice a day, including before bedtime. This removes residues from the mouth and gets infants used to having their mouth cleaned. When the teeth do appear, they should al-

so be daily.

- ✓ Teeth should be brushed or wiped with a soft, clean cloth or gauze twice a day (morning and evening). Use a small, child-sized toothbrush with soft, rounded-end bristles may and plain water. Continue using a clean gauze pad or washcloth to clean those areas in the mouth without teeth. Unless advised to do so by a dentist or other health professional, parents should not use fluoride toothpaste for children ages two and under. Parents should check with their health care provider regarding the use of any toothpaste including “baby” toothpaste.
- ✓ Do not share utensils and toothbrushes among family members.
- ✓ Discourage the practice of parents and caregivers chewing the food to be given to the infant to prevent the transfer of *Streptococcus mutans* from the adult’s mouth to the infant’s.
- ✓ Infants should never be put to bed with a bottle of infant formula, milk, juice, or sweet drink. Encourage parents and caregivers to hold their infants when feeding them and to teach them to fall asleep without a bottle.
- ✓ Do not permit walking toddlers to carry around a bottle that is filled with formula, juice, etc., throughout the day.
- ✓ Begin weaning from bottle to cup around six to seven months of age. Complete weaning from the bottle around the time of the first birthday. As weaning occurs, formula or breastmilk can be offered in the cup.
- ✓ Never dip pacifiers in honey, sugar, or corn syrup.

Common Concerns in Infancy



Certain gastrointestinal disturbances are commonly reported by parents and caregivers of infants. These include constipation, diarrhea, spitting up, and colic. When parents and caregivers complain of these problems WIC staff need to assess whether it is a chronic problem, a one-time problem, and whether the parent or caregiver understands what is "normal."

Constipation

Many parents and caregivers become concerned if their infants do not have daily bowel movements. Although many infants have a daily stool, others may only have a stool every two to three days. The older breastfed infant (over 6 weeks of age) as well as bottle-fed infants may have infrequent stools. Frequency is not a good indicator of constipation. Constipation in infants is better characterized by hard, dry stools that are difficult to pass.

Constipation in infants can be caused by a variety of factors or conditions including: physical problems, improper formula dilution, i.e., the formula is not being mixed with enough water so the infant is not getting adequate water, or inappropriate diet.

The amount of iron supplied by iron-fortified infant formula does not cause constipation. Studies have shown that there is no relationship between iron-fortified infant formula and gastrointestinal distress, including constipation.

If a parent or caregiver complains that an infant is constipated, refer the infant to a health care provider for medical evaluation. If the health care provider determines that the infant's diet is inappropriate and a factor influencing the constipation, it is appropriate to assess the infant's diet, with particular focus on:

- Adequacy of intake of breastmilk or infant formula
- Proper infant formula preparation and dilution if formula-fed
- Appropriate types and amounts of complementary foods being fed
- Premature introduction of complementary foods if the infant is less than 4 months old.

The WIC Competent Professional Authority (CPA) should encourage consultation with a health care provider before use of laxatives, enemas, or manipulation to induce a bowel movement. These can be harmful to infants. Discourage the use of honey and corn syrup added to formula or water. Honey and corn syrup may contain botulism spores which are harmful to infants and therefore should not be used. Discourage over dilution of formula. This can result in the infant not receiving enough calories and nutrients and may be at risk of water intoxication. Parents and caregivers should

always consult with their health care provider before making any changes to the infant's formula



Diarrhea

Diarrhea is defined as the passage of frequent, loose, unformed, or watery stools. Diarrhea is difficult to define, however, because each infant has his own pattern of bowel movements, and what is normal for one infant may not be normal for another.

For example, breastfed infants may normally have loose, frequent stools. This is not a matter of concern. However, if the stools become green, explosive, and foul smelling, then there is cause for concern.

Diarrhea in infants can be caused by a reaction to a food, excessive juice consumption, use of certain medications, medical conditions or infections, malabsorption of food, or consuming contaminated food or water.

Persistent diarrhea can be dangerous. Parents and caregivers of infants with true diarrhea should be referred to their health care provider for treatment to prevent dehydration and other serious complications in the infant. Use of ordinary beverages such as carbonated beverages, sports drinks, fruit juice, tea, or chicken broth is not recommended for hydrating young children.

The Centers for Disease Control and Prevention (CDC) and the AAP recommend the following during diarrhea:

- Breastfed infants should continue to breastfeed on demand.
- Formula-fed infants should continue to be fed usual amounts of infant formula immediately following rehydration (if indicated).
- Low lactose or lactose-free infant formula is usually not necessary.
- Infant formula should not be over diluted during diarrhea.
- The use of soy-based formulas is not necessary.
- Infants eating complementary foods should continue to receive their usual diet during diarrhea.
- Simple sugars (as found in soft drinks, juice, and gelatin) should be avoided; solid food intake should emphasize complex carbohydrates.
- Withholding food for >24 hours or feeding highly specific diets (for example the BRAT diet [bananas, rice, applesauce, tea]) is inappropriate.

Depending on an infant's condition, a health care provider may prescribe an appropriate oral rehydration solution to prevent and treat dehydration resulting from diarrhea.

Oral rehydration solutions should be used only under the supervision of physicians or other trained health personnel.

Spitting Up



It is normal for young infants to spit up a small amount of breastmilk or infant formula after feedings. Spitting up should be differentiated from vomiting. Spitting up involves small amounts of milk that are spilled from the mouth, as opposed to forcefully ejected out of the mouth. This may occur several times a day during or shortly after feeding. It can occur with jostling, squeezing, or even just laying the infant down. Spitting up is harmless if the baby is growing well and content.

Occasionally, a change in feeding techniques will alleviate the problem. Some feeding techniques, which may be the cause of excessive spitting up, include:

- Feeding too much food at a time (encourage parents and caregivers to watch for signs of satiety)
- Feeding with nipples that have holes that are too large—these allow liquid to flow too rapidly causing excessive intake and swallowing of air
- Feeding the baby without burping him during and after the feeding
- Playing with and jostling the infant right after eating

Although some caregivers may want to lay their infant on his or her stomach to prevent spitting up, infants should only be put to sleep lying on their back, without pillows, blankets, or toys to prop the infant. Following these guidelines will help prevent Sudden Infant Death Syndrome (SIDS).

Ways to reduce excessive spitting up include:

- Burp the infant several times during a feeding (generally during normal breaks in a feeding).
- Hold the infant in an upright position after a feeding for about 15 to 20 minutes.
- Avoid excessive movement or play right after eating.
- Avoid forcing the infant to eat or drink when full and satisfied.

A more severe form of spitting up is called *gastroesophageal reflux (GER)*. Reflux is defined as the spontaneous, effortless regurgitation of material from the stomach into the esophagus. Infants with GER who have wheezing, recurrent pneumonia or upper respiratory infections, symptoms of esophagitis, irritability during feeding, or failure to thrive are at particular risk and should be referred to a health care provider immediately.

Vomiting refers to the forceful discharge of food through the esophagus and involves a more complete emptying of the stomach's contents. It can occur as a symptom of a reaction to food eaten, a

minor or major medical condition, or use of certain medications. Vomiting can place an infant at risk of dehydration. Refer an infant to a health care provider for medical evaluation if the caregiver notes that the infant is vomiting or that his or her spitting up is unusual in terms of volume, contents, or accompanying symptoms.

Colic

Up to one fifth of all infants experience colic in the first few months of life. Colic is described as prolonged, inconsolable crying that appears to be related to stomach pain and discomfort (infants may pull their legs up in pain) often in the late afternoon or early evening. It usually develops between 2 to 6 weeks of age and may continue until the infant is 3 to 4 months old. Formula-fed infants seem to experience colic more often than breastfed infants. No clearly effective treatments to manage colic have been shown.



A number of psychosocial and dietary reasons have been suggested as the cause of colic, e.g., maternal anxiety, overfeeding, but these theories have been disproved. Recent studies have linked cow's milk and soy milk with colic. However, the bottom line is—the causes of colic are not really known.

The psychological stress and harm to the parent-child relationship is of concern when an infant has colic. Parents and caregivers need support and assurance throughout these difficult months.

Offer parents and caregivers of infants with colic the following suggestions:

- Burp the infant if needed
- Change the diaper if needed
- Soothe the infant by swaddling him in a blanket, rocking him to music
- Carry him in a carrier

If the infant cries excessively, encourage the parent or caregiver to identify someone they can contact if they feel they may lose control. Empathize with parents and caregivers to understand the frustration of not being able to soothe one's baby.

√ SELF-CHECK #6

1. Fill in the blanks:
 - a. The four most important nutrients for healthy teeth are:
_____ _____
_____ _____
 - b. The American Academy of Pediatrics (AAP), the American Academy of Pediatric Dentistry (AAPD) and the CDC recommend _____ for infants less than 6 months old.
 - c. Early childhood caries are caused by bacteria called _____.
2. Name at least one way the early childhood caries-causing bacteria is spread.
3. True or False
 - a. Infants put to bed with a bottle of formula, milk, or juice can develop tooth decay.
 - b. Good dental health practices begin early in life, even before infants have teeth.
 - c. It is acceptable to over dilute formula for two to three days for infants with constipation.
4. List four potential feeding-related causes of spitting up.
 - a.
 - b.
 - c.
 - d.
5. List at least three suggestions for a caregiver of an infant with colic.
 - a.
 - b.
 - c.



Nutrition for the Older Infant

Changing from strained or pureed foods to foods with more texture is an important part of developing the skills to learn to eat independently. Refer to the chart, *Sequence of Development and Feeding Skills in Healthy, Full term Infants*, on page 34 for review of feeding skills development.

Finger Foods

When the baby shows signs of being able to chew with up and down movement, and can move the tongue from side to side and swallow, finger foods should be offered. This is usually at seven or eight months of age.

Finger foods are small pieces of soft food that can be easily dissolved in the throat or dislodged if they become stuck. They are called finger foods because they allow infants to practice using their hands and fingers to feed themselves. Examples of good choices for finger foods include: soft, peeled fruit; cooked vegetables; mild cheese; toast pieces; tortillas, crackers; and small pieces of tender meat.

Food in small, round, or hard pieces that can become lodged in the baby's throat or that can "ball up" in the baby's throat should not be given. Examples of such foods are nuts, popcorn, raisins, raw vegetables, grapes, cherries, whole hot dogs or meat sticks, and peanut butter on soft bread.



Self-Feeding Skills

Near the age of one year, infants become interested in holding utensils and feeding themselves. They enjoy playing with spoons during meal- or play-time. This is a good way for them to begin to learn to use a spoon. Infants gradually learn to get food on the spoon and the spoon to their mouth, although food is often spilled before it gets into their mouth.

Many infants prefer to feed themselves with their hands and fingers rather than with utensils. This is their way of experimenting with food. It is important that infants be allowed to take part in this activity, even though it is messy, because it is an important part of learning to feed themselves. Some suggestions that the CPA can offer to parents and caregivers of infants who are learning to feed themselves include:

- Make mealtime happy and calm. Smile and talk to the baby.



- Be patient with the baby during this learning period.
- Pick a time or times of the day to allow the baby to “play” with his food.
- Cover the floor under the baby’s chair with paper or an old shower curtain and dress the baby in clothing that will not be harmed by spilled food.
- Include foods that are fed to the baby, as well as items that the baby can self-feed at meals.
- Give the baby small portions of food.
- Avoid spicy foods. Infants also do not need added butter, salt, or sugar.
- Let the baby use a cup with all meals.
- Stay with the baby when he eats so that it is a social experience (and for safety in case of choking).

Each infant develops at his own rate. There is no specific age at which an infant should be able to feed himself, although full term infants should be trying to finger feed themselves by seven months of age. The process of learning to eat independently continues into the second year of life.

Meal Planning

An infant who is 8 to 12 months of age should be eating many types of complementary foods with a variety of textures and colors. Finger foods should be included at meals and snack time. The daily diet should include foods from all of the food groups. Encourage parents and caregivers to offer complementary foods following a schedule that considers the baby's appetite and the family's schedule. Smaller infants and infants at the lower end of the age range require smaller portion sizes than older, larger infants. Offer breastmilk or formula in a cup.

See *Guidelines for Feeding Healthy Infants, Birth to 1 Year Old* on page 35 for variety, textures and amounts of complementary foods appropriate for infants 8 to 12 months of age. See the following page for example meal patterns.

Example Meal Patterns		
Meal	8th to 10th Month	10th to 12th Month
Early Morning	Infant cereal Mashed fruit Breastmilk or formula	Infant cereal Soft fruit Breastmilk or formula
Mid Morning	Crackers Juice Yogurt	Crackers Juice Cheese slices
Noon	Mashed cooked egg yolk Grain (toast strip) Mashed fruit Breastmilk or formula	Chopped meat or cooked egg yolk Vegetable Rice or grain Breastmilk or formula
Mid Afternoon	Breastmilk or formula	Canned fruit Crackers
Supper	Ground meat Mashed potatoes Mashed vegetable Breastmilk or formula	Chopped meat Cooked vegetable Pasta or grain Breastmilk or formula
Bedtime	Infant cereal Breastmilk or formula	Dry finger cereal Breastmilk or formula

Home-Prepared Baby Foods



Home-prepared baby foods are a nutritious, inexpensive way to feed an infant. However, care must be taken during the preparation and storage of the food to prevent contamination. The following are guidelines to discuss with parents and caregivers:

- ☺ Start with quality, fresh foods, if possible when making infant foods. Plain, frozen foods, with no added sugar, salt, or sauces are also a good choice. If canned foods are used, select those without salt or syrup and packed in their own juice (if regular canned foods are used, pour off syrup or salty water and rinse the food with clean water).
- ☺ The preparer's hands should be washed in hot, soapy water. All surfaces and equipment used in the preparation should be thoroughly washed and rinsed.
- ☺ Wash fruits and vegetables; and remove skin, pits, and seeds. Cook the vegetables and hard fruits in a small amount of water (to preserve the nutrients) until tender (boil or steam). If liquid is needed in the preparation, use water, breastmilk, or formula only.
- ☺ Remove bones, fat, and gristle from meats poultry, and fish. Meats, poultry, fish, dried beans or peas, and egg yolks (not egg whites) should be well cooked. Baking, boiling, broiling, poaching, and steaming are good cooking methods. Due to their high salt and/or fat content, hot dogs, sausage, bacon, bologna, salami, luncheon meats, other cured meats, fried animal foods, and the fat and skin trimmed from meats are not generally recommended for infants. Hot dogs, bologna, and luncheon meats also are not recommended as they may contain harmful bacteria unless they are heated thoroughly until steaming hot.
- ☺ Blend, grind, or mash the food to a texture and consistency that is appropriate for the infant's stage of development. Food texture should progress from being pureed to mashed to diced. Providing new textures encourages the infant's further development.
- ☺ If using the same foods that the family eats, the infant's portion should be separated before adding salt, sugar, syrup, gravy, sauces to the family's food. Honey or corn syrup should never be added to an infant's foods because of the risk of infant botulism.
- ☺ Spoons used to "taste test" foods should not be put back into the food.



Microwave ovens SHOULD NOT be used to warm baby foods, whether left in the jar or placed in another container. The unevenness in the consistency of the baby foods causes the more liquid or watery parts to heat up faster in the microwave than the thicker or more solid parts, also burning baby. This can allow pockets of steam to occur leading to scalds from splattered foods or exploding jars.

- ☺ If the food is not to be eaten immediately after it is prepared, it must be properly stored. Home-prepared foods can be stored in a refrigerator for up to 48 hours (except meats and egg yolks, which should be used within 24 hours).
- ☺ Foods can be stored in a freezer for one month. To store single servings for the freezer, the food can be frozen in clean ice cube trays or muffin liners and covered with aluminum foil. Once frozen, the food can be removed from the tray and stored in a freezer container or plastic freezer bags. The frozen foods can be placed in a pan or dish and thawed in the refrigerator or warmed in an oven or pan of water on the stove. Any thawed, heated food that is not eaten should be thrown away.
- ☺ Acceptable home-prepared vegetables are asparagus, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, collard greens, green beans, green peas, green peppers, kohlrabi, kale, plantain, potatoes, spinach, summer or winter squash, and sweet potatoes. Do not feed home-prepared spinach, beets, turnips, carrots, or collard greens to infants under 6 months of age as these contain high levels of nitrates that could make the infant sick. These fresh fruits can be mashed (after peeling) without cooking if ripe and soft: apricots, avocado, bananas, cantaloupe, mango, melon, nectarines, papaya, peaches, pears, and plums. Stewed pitted dried fruits can be pureed or mashed. Apples, pears, and dried fruits usually need to be cooked in order to puree or mash them easily.

Using Commercially Prepared Foods



Some parents and caregivers will prefer the convenience of purchasing infant foods from the store. Help parents and caregivers to understand that there will be a point in time when the infant will also be ready for table foods that are easy to chew and safe to swallow. Around one year of age, infants should be able to eat what their parents and caregivers eat—only the size of the pieces of food may need to be modified.

For parents and caregivers who purchase jarred infant food, encourage them to place the food into a clean dish before it is served to the infant and not directly from the jar or container. Any food that leftover from the serving dish should be discarded. The reason is if the infant is fed directly from the baby food jar or if leftover food is returned to the jar, the infant's saliva will enter the food. The saliva contains bacteria that can cause the food to spoil. If the infant was not fed directly from the jar, any uncontaminated food left over in the jar can be tightly resealed and stored in the refrigerator for up to 48 hours.



Developing Healthy Eating Habits

Give to parents and caregivers these useful tips about feeding habits and how all this information relates to their infants' attitudes toward eating:

- Lifelong eating habits are formed in childhood and early positive experiences with foods can encourage acceptance of them later in life.
- It takes time to learn to enjoy some foods. Parents should keep offering a food so it becomes familiar to the child.
- Allow children to develop their own food likes and dislikes. Parents and caregivers can serve as good examples for their children by being open to trying new foods themselves.
- The habits of eating sugar, salt, and fat begin early in life for many people. These habits can be harmful if learned while young and continued throughout life. Thus, parents and caregivers should limit less-nutrient-dense foods such as potato chips, soft drinks, and desserts.
- The family's mealtime is an important time for children to learn good eating habits. Have the baby take part in the family's mealtime. Perhaps feed the baby earlier and give him finger foods while the rest of the family eats.
- Parents and caregivers are responsible for presenting appropriate food in a supportive fashion. The baby should be allowed to make the choice about how much to eat. If a baby is pressured to eat, feeding problems can occur.

Weaning



Weaning from the breast or bottle to a cup is a gradual process requiring the infant to learn new skills. Some infants learn to drink from a cup more easily than others. Some infants, 4 to 5 months of age, may be able to drink or suck small amounts of liquid from a cup when held by another person. At about 6 months of age, most infants develop the ability to, with assistance, drink from a cup with some liquid escaping from their mouths. After 8 months of age, when infants begin to curve their lips around the rim of a cup, they are able to drink from a cup with less spilling. Reassure parents and caregivers that spills and some mess normally occur as an infant learns to use a cup, and that maintaining patience during this time is important. Parents and caregivers should try to totally wean their infants off bottles and onto a cup by about 12 to 14 months of age. Those who are still feeding from a bottle after this age may be at risk for early childhood caries.

Weaning From the Bottle

To make weaning easier when beginning the process, instruct the parent and caregiver to introduce a cup in place of a bottle at the feeding the infant is least interested in or at mealtimes when other family members are drinking from cups. Encourage the parent and caregiver to offer assistance in holding the cup for the early weeks of weaning.

At first, the infant will not consume the same quantities of formula from a cup as from a bottle at one sitting. The parent and caregiver should continue with the cup at this feeding for a week or two before another cup feeding is added.

The weaning process should continue gradually until the infant is entirely weaned from the bottle. The bedtime bottle and early morning bottle may be the most difficult to discontinue. This is a time when the infant is tired and more apt to not want his routine changed. The bottle is often a source of security. To help the infant feel secure, have on hand a favorite toy or blanket when the bottle is being used, so that when the bottle is removed, the infant has the favorite item.

Weaning From the Breast

The decision to wean the breastfed infant from the breast to the bottle or cup is an individual one and should be left up to the mother. For mothers who decide to wean their infant from the breast before their infant is one year old, the CPA can encourage mothers of older infants (over six months old) to wean to a cup, depending on the in-

fant's developmental ability, while younger infants may need to be weaned to a bottle. The CPA should talk with mothers about breast-feeding to make sure they are deciding to wean based on correct information.

Recommend that weaning be done slowly and gradually. Weaning is usually accomplished by stopping one nursing at a time. It is suggested that the first feeding to stop be the one in which the infant is least interested or when the breast do not feel full.. The mother then substitutes a bottle or cup of breastmilk or iron-fortified formula for this feeding. *Gradually, over several days or even weeks, additional feedings can be eliminated. When down to one feeding per day, the infant can be breastfed every other day. Some mothers and infants may still want to breastfeed once in a while just for comfort or to relax.* During this time give the baby extra cuddling and attention so that weaning does not mean separation from the mother. The weaning process will result in a gradual decrease in the breastmilk supply with little or no discomfort to the mother. If the mother should experience some engorgement, she should be instructed to hand express enough milk to relieve the discomfort.

Counseling Tips for Parents about Weaning



- Between six and 12 months of age, infants are developmentally ready and usually interested in learning to drink from a cup. Delaying the change to a cup during this period can result in a refusal to change at an older age.
- Cups with spill-proof lids (sippy cups) are not recommended since they may encourage the infant to carry the cup and drink more often. Frequent sips of infant formula or juice from the cup can cause tooth decay. Discourage the practice of allowing toddlers to use the cup without restriction (e.g., walking around with a cup).
- When liquids are first introduced from the cup, the infant's lips may not close around the edge of the cup and liquids will leak. At first it may be helpful for the caregiver to hold the cup. Feed very slowly, i.e., tilting the cup so that a very small amount of liquid (one mouthful) leaves the cup; then, the infant can swallow without hurry.
- Give small amounts (1 to 2 ounces) of water, breastmilk, or infant formula in the cup. As the baby gets used to drinking from a cup, one to two ounces of pasteurized 100 percent juice may be offered. *Sweetened beverages should not be given..*

- Some infants do not want to give up breast or bottle feeding or are unwilling to drink from a cup. The weaning process often requires much patience from the parents and caregivers.
- Infants who use the bottle after one year of age may drink too much milk and not eat enough complementary foods that provide iron and other important nutrients. Inadequate iron can lead to anemia.
- For infants who are bottle fed, the bottle given before a nap or bedtime is often the most difficult one to discontinue. This bottle can also be the most harmful to the teeth if it is filled with a sugar-containing beverage (breastmilk, formula, juice) and the infant takes it to bed.

Some suggestions for helping an infant give up the bedtime bottle include:

- Interest the infant in something other than the bottle at bedtime—a stuffed toy, blanket, etc.
- Provide lots of affection and attention instead of a bottle at bedtime.
- Offer a small snack or beverage from a cup near bedtime (Be sure to brush/clean teeth and gums afterwards.).
- Put a small amount of water in the bottle instead of milk.

Bottles are inappropriate after 14 months of age! The transition might go more smoothly if during the last weeks of use of the bottle, the child has had an opportunity to bond to a blanket, stuffed animal or book during bottle use so when the bottle is taken “cold turkey” the child still has a security item.

√ SELF-CHECK #7

Choose the correct phrase(s) that correctly completes the statement (may be multiple answers):

1. Finger foods should be offered:
 - a. when the infant starts to walk alone.
 - b. when the infant sleeps through the night.
 - c. when the infant can chew with up and down movements.
 - d. when the infant can move his/her tongue from side to side.

2. Which choices of finger foods are appropriate for an older infant (eight to 12 months)?
 - a. soft, peeled fruit
 - b. grapes
 - c. toast pieces
 - d. crackers
 - e. popcorn
 - f. peanut butter on soft bread

3. True or False:
 - a. Many infants prefer to feed themselves with their hands and fingers rather than with utensils.
 - b. Infants who are learning to feed themselves should be served large portions of food.
 - c. All developmentally normal infants should be able to feed themselves by nine months of age.
 - d. Infants eight to 12 months of age should be eating many types of complementary foods with a variety of textures and colors.
 - e. Lifelong eating habits are formed in childhood.

4. True or False
 - a. Weaning from the breast or bottle to a cup should take approximately one to two days.
 - b. Weaning to a cup should begin when an infant can sit up without support and is eating complementary foods.
 - c. Weaning to a cup should begin after 12 months of age.
 - d. Weaning to a cup from the breast or bottle is a gradual process.
 - e. Normal, healthy infants should not use bottles after 14 months of age.
 - f. Infants need help holding the cup for the early weeks of cup feeding.

SELF-CHECK #7 (Continued)

5. Which two choices accurately complete the following statement?

Home-prepared foods for infants.....

- a. can be exactly the same foods that are prepared for the rest of the family with the added salt, sugar, etc.
- b. can be stored in a freezer indefinitely
- c. are generally less expensive.
- d. can be reheated over and over.
- e. must be prepared and stored with care to prevent contamination of the food.

6. Fill in the blank with the correct word.

Honey or corn syrup should not be fed to infants less than one year of age because they may contain _____ spores.

7. Which foods should never be given to infants because they increase the risk of choking?

- | | | |
|--------------------|----------------|-------------|
| Raisins | Whole hot dogs | Apple juice |
| Soft, ripe bananas | Whole grapes | Popcorn |

Infant Nutrition Assessment



Although it is still a part of a nutrition assessment to identify risk factors, however, the focus of the nutrition assessment should not be on what risks or deficiencies will qualify the infant for the WIC program. The focus of the assessment should be on what information the CPA can collect and identify to assist the parent or guardian in gaining a greater appreciation of how the infant can achieve optimal growth and development in a nurturing environment and to develop a foundation for healthy eating practices. This is all part of a value enhanced nutrition assessment (VENA).

Introduction

As we discussed throughout this module, adequate nutrition during infancy is very important for long-term growth and health. All infants enrolled in WIC will receive a nutrition assessment. Some infants will need special nutrition counseling because of certain factors related to their health. These are called nutrition assessment risk factors. Nutrition risk factors affect an infant's nutritional needs and his/her food intake.

For instance, feeding an infant cow's milk instead of breastmilk or infant formula is considered to be a nutrition risk. This is because: (1) The protein level in cow's milk is too high and may stress the infant's immature system; (2) the type of protein and fat are more difficult for the infant to digest; (3) it contains higher levels of sodium and other minerals than are recommended; (4) it is a poor source of iron and vitamin C; and (5) it may cause intestinal bleeding and contribute to the development of iron-deficiency anemia.

An infant with a nutrition risk has an increased chance of poor growth and development. Therefore, it is extremely important that we understand the nutrition risks of infancy and how to identify them.

There are some infants who are identified as ***High Risk***. These infants have more serious nutrition risks than the others. An example of this is an infant who is not gaining weight adequately. ***High Risk*** infants need in-depth nutrition counseling and education. CPAs must refer all ***High Risk*** participants to the Nutritionist within 45 days of their nutrition assessment.

Non-high Risk infants are at risk for nutrition-related problems, but do not require the intensive follow-up of as ***High Risk*** infants. The CPA provides client-centered nutrition education and assists the parent or caregiver in identifying a nutrition goal to achieve positive health outcomes.

This section of the module will define and discuss those nutrition risk factors that are assessed in an infant WIC nutrition assessment.

The nutrition assessment risk factors will be divided into five main categories:

- A. Anthropometric
- B. Biochemical
- C. Clinical
- D. Dietary
- E. Environmental and Family Factors

Each nutrition assessment risk factor will be identified as either ***High Risk*** (requiring referral to the Nutritionist for further assessment and counseling) or ***Non-high Risk*** (referral to the Nutritionist is not required but the CPA may do so if the CPA feels WIC family can benefit from further guidance).

Growth and Development in Infants

Growth is an increase in the physical size of the body whereas **development** is the process of maturing. Several factors affect these milestones of infancy.

1. **Genetics** - Inherited family characteristics that influence body build and height as well as inherited hormonal deficiencies such as, hypothyroidism, can affect normal growth and development.

2. **Environment** - Social and economic variables (such as, parent's or caregiver's ability to show affection, living in poverty, parents' educational level) that influence a person's ability to grow and develop.

3. **Behaviors** -Mother's behaviors can affect an infant's biological abilities for growth. For example, habits such as smoking or drug use during pregnancy can reduce birth weight and affect growth. Parents or caregiver's food selection and feeding behaviors can affect growth and development.

Anthropometric Nutrition Assessment Risk Factors

There are several anthropometric/growth-related factors that may be affected by nutrition and therefore will qualify an infant for the WIC Program. An infant's weight status, length, gestational age at birth, rate of weight gain during the first year, as well as birth weight all are indicators of how an infant will likely grow or is growing. The quality and quantity of the infant's diet will further influence the infant's growth and development.

The anthropometric nutrition assessment risk factors that will be discussed include:

- Underweight; at risk of becoming underweight
- Short stature; at risk of short stature
- At risk of becoming overweight
- Inadequate growth
- Low birth weight; very low birth weight
- Prematurity
- Small for gestational age
- Large for gestational age

It is important to recognize that identifying WIC infants as having these risk factors provides staff with a baseline for providing client-centered education.

An infant born with a low birth weight will need to receive optimum nutrition in order to grow to his/her potential. WIC CPAs have an opportunity to greatly improve the outcome of an infant with growth challenges by providing nutrition education and, when necessary, making referrals to Nutritionists, health care providers, and other programs to help families with children who have special needs.

If the CPA identifies an infant with a rapid increase in weight, staff should gather information on feeding and eating skills and the family environment to assess whether the family may benefit from infant feeding guidelines review or other nutrition information and education and counseling.

This section describes the anthropometric/growth-related nutrition assessment risk factors and provides an overview of some of the ways the CPA can work with the parents and caregivers. In all situations, an important role of the WIC staff is to collect information to best understand what the parent or caregiver's concerns are about the infant. In WIC, CPAs should become skilled at finding out about the infant's feeding environment (when and where the infant is fed, who feeds the infant, does the infant feed himself, etc.). The CPA must assess the parent or caregiver's level of concern about feeding-related issues and learn how they are responding to them.

For example, a parent or caregiver is concerned that her baby is small and is not drinking enough formula, so she has been trying to make the baby finish all bottles. The parent or caregiver may not realize that her feeding reaction could make the situation worse. In WIC we want to emphasize healthy feeding relationships rather than focus only on weight. In this situation, the CPA could acknowledge the mother's concern about the baby's size and then go on to collect information about the feeding environment to determine what to discuss. Force-feeding may not be the answer.

WIC CPAs are a great source of nutrition and developmental information. By providing anticipatory guidance on the next developmental milestone or expectation with feeding, you can prevent inappropriate feeding behaviors from ever occurring. At every visit, praise parents and caregivers for what they are doing correctly. Help them increase their confidence in parenting and, maybe, they'll be more open to other suggestions.

Another important role of the CPA is referring families to their health care providers and other appropriate community resources.



Monitoring Growth

WIC uses growth charts to evaluate normal growth in length and weight. The standard growth curves on the charts are the variations seen in the normal growth of healthy infants and children. The charts were constructed by weighing and measuring large numbers of infants and children and noting the variations in height and weight over time. When you use the growth charts in this way--to compare an individual infant's growth with that of other infants -- you are primarily checking for changes in the growth rate. Don't get caught up in treating growth curves like grades in school. An infant growing at the 95th percentile isn't doing any better than the one growing at the 5th percentile. The most important aspect of the growth curve is to be able to compare each individual infant to herself--to evaluate her growth as it progresses from one month to the next. You will want to assess whether an odd result is an inaccurate measurement or a potential health problem. Refer to Screening Module- Level 1 for more information on accurate measurements and plotting.

Let's now review the specific nutrition assessment risk factors related to anthropometrics/growth.

Underweight or At Risk of Becoming Underweight

Underweight reflects the body's thinness. It doesn't tell us the cause or nature of underweight. Poverty, infectious disease, and inadequate energy intake are factors that can lead to underweight. The infant who

weighs less than other infants of the same length and age may be an indication of a medical problem, a feeding problem, or perhaps it may be a normal weight for the infant.

Weight-for-length describes body proportionality and is sensitive to acute undernutrition, but can also reflect long-term status. Physical growth delay is used as a proxy for the deleterious effects undernutrition can have on immune function, organ development, hormonal function and brain development. Participation in WIC has been associated with improved growth in both weight and height in children.

To assess inadequate growth, measure the differences of weights and lengths between two points in time. We plot those measurements on the charts to determine the rate of growth. In most cases, once an infant is established in a percentile rating of growth, she will remain in that percentile track. When an infant does not grow at their expected rate, we become concerned that either she/he is not receiving adequate nutrition, or that she/he may have a medical problem. There are many reasons why an infant may have difficulty with gaining weight. Some of these include:

- inadequate intake of food being offered (such as with a family in poverty, a depressed parent or caregiver, quiet baby who doesn't let his needs be known, or parent or caregiver who lacks knowledge and information on the needs of an infant)
- inadequate retention of food, such as is common with vomiting, reflux, and diarrhea
- inadequate absorption of food as noted with cystic fibrosis
- increased calorie needs
- decreased growth efficiency with certain diseases or illness (such as with the Human immunodeficiency virus -HIV)

Possible factors associated with not adequately nourishing an infant include a:

- lack of social support for the parent or caregiver;
- disorganized family;
- depressed parent or caregiver;
- parent's or caregiver's lack of education, health, and nutrition knowledge.

CPA Role

Education Tips and Follow Up:

- Establish rapport with the parent or caregiver to determine possible factors for the infant’s low weight. Utilize the three step client-centered process. Ask probing questions to determine appropriate frequency of feeds and length of feeds, etc. If formula feeding, ask how formula is being prepared.
- Find out about the eating environment.
- Find out how they feel about their infant’s weight.
- Ask what their health care provider has said.
- Discuss the general eating behaviors/problems that can lead to inadequate calorie intake.

Infants assessed with this risk factor are considered **High Risk** and must be referred to the Nutritionist for further assessment and nutrition counseling.

Short Stature or At Risk of Short Stature

Stature is the amount of linear growth that has been achieved. Short length may be an indication of some form of chronic undernutrition due to a disease process or inadequate intake of nutrients. Over a long period of time an illness or nutritional deficiency may contribute to linear growth retardation or cessation. Stunted infants are likely to become stunted children, and stunted children are likely to become stunted adolescents, and so on.

It may also be perfectly normal for this infant to be small. Some children have a family history of short stature and grow at a normal rate; however, short parental stature shouldn’t be used as an explanation for a child’s poor growth. Some children’s parents may have grown up poor and undernourished in a developing country. WIC staff must assess normal, healthy feeding and eating to ensure nutrition is not affecting the infant’s growth.

CPA Role

Education Tips and Follow-Up

- ✓ Establish rapport with the parent or caregiver to determine possible factors for the infant’s short stature. Utilize the three step client-centered process. Ask probing questions to determine appropriate frequency of feeds and length of feeds, etc. If formula feeding, ask how formula is being prepared.
- ✓ Find out about the eating environment.
- ✓ Find out how they feel about their infant’s length.
- ✓ Ask what their health care provider has said.
- ✓ Discuss the general eating behaviors/problems that can lead to possible inadequate calorie intake.

Infants assessed with this risk factor are considered **Non-high Risk** and do not require a referral to the Nutritionist. However, the CPA may refer to the Nutritionist for further assessment and nutrition counseling.

At Risk of Becoming Overweight

In WIC we want to emphasize a healthy feeding relationship rather than focus only on weight.

Overweight is not defined in children less than two years of age, because overweight in infancy is not a predictor of overweight as an adult, and thus is not considered a nutrition risk factor in WIC. However, the risk of an infant growing up to become an overweight adult is related to the size of his/her parents. That is, if one or both of the infant's parents are overweight, the likelihood the infant will grow up to be an overweight adult increases.

If an infant has a rapid increase in weight, the following information may be applicable. Infants who become overweight should never be put on a diet to lose weight. Weight loss during infancy would deprive the infant of nutrients needed for growth and development. *These infants should be given time to "grow into" their weight.* Also, the best milk for an overweight infant is the same as for a normal weight infant – either breastmilk or iron-fortified infant formula.

CPA Role

Education Tips and Follow-Up

- Establish rapport with the caregiver. Utilize the three step client-centered process. Ask probing questions to determine appropriate frequency of feeds and length of feeds, etc. If formula feeding, ask how formula is being prepared. The at risk of overweight infant's diet should be assessed to determine whether it is developmentally appropriate for the infant, whether correct formula dilutions are being made, and if any inappropriate foods are being fed.
- Find out how the parent or caregiver knows when the infant is hungry and full.
- Discuss the infant's behaviors and patterns of eating. Determine if the feeding relationship could be improved.
- Find out how the infant is treated when he cries.
- Discuss with the parent or caregiver the child's behavior and patterns of eating which may be causing the problem.
- Identify potential feeding issues and make suggestions for parents and caregivers. Include:
 - If feeding solids in the bottle, recommend only feeding solids from a spoon when developmentally ready. If not ready, stop the feeding of solids entirely.
 - If finger foods include cookies and other high fat treats, suggest nutritious finger foods such as soft fruit and cooked

vegetables.

- If giving sweetened water or soft drinks, advise that breastmilk or formula is the best choice for thirst. Limit juice or, better yet, eliminate entirely.
- Discourage forcing the infant to finish a bottle or food.
- Discuss how to watch for the infant's signs of fullness and respect them.
- If food is used to quiet the baby every time he cries, encourage the parent or caregiver to distinguish between cries of hunger and those of discomfort. Offer food only when the infant is hungry.
- If the infant is kept mostly in an infant carrier, encourage the parent or caregiver to allow the infant to be active by playing with him; let him move unrestricted.
- If the infant is forced to eat everything that is offered, recommend that parents and caregivers respect the baby's food likes, dislikes, and needs. Most infants like plain food. Butter and sugar may make the flavor palatable to parents, but adds unnecessary calories for baby. Parents and caregivers can learn to read labels on baby food jars and avoid the extra calories provided by sugar, tapioca, and starch.
- Suggest parents and caregivers be in charge and take responsibility for the child's health. Older children, grandparents, and babysitters often feed the infant and may not be as particular as the caregiver about what the infant is being fed.

Infants assessed with this risk factor are considered **Non-high Risk** and do not require a referral to the Nutritionist. However, the CPA may refer to the Nutritionist for further assessment and nutrition counseling.

Inadequate Growth

As mentioned previously there are many reasons why an infant may have difficulty with gaining weight. Some of these include:

- Inadequate intake of food being offered (such as with a family in poverty, a depressed parent or caregiver, quiet baby who doesn't let his needs be known, or parent or caregiver who lacks knowledge and information on the needs of an infant)
- Inadequate retention of food, such as is common with vomiting, reflux, and diarrhea
- Inadequate absorption of food as noted with cystic fibrosis
- Increased calorie needs
- Decreased growth efficiency with certain diseases or illnesses (such as HIV)

To assess inadequate gain, determine the differences in weights between two points in time. We plot those measurements on the growth charts to determine the rate of gain. In most cases, once an infant is established in a percentile rating of gain, she/he will remain in that percentile track. When an infant does not gain at their expected rate, we become concerned that either she/he is not receiving adequate nutrition, or that she/he may have a medical problem. Possible factors associated with not adequately nourishing an infant include a:

- lack of social support for the parent or caregiver;
- disorganized family;
- depressed parent or caregiver;
- parent or caregiver's lack of education, health, and nutrition knowledge.

CPA Role

Education Tips and Follow Up:

- Establish rapport with the parent or caregiver to find out how they feel about their infant's growth and what their health care provider has mentioned. Utilize the three step client-centered process. Ask probing questions to determine appropriate frequency of feeds and length of feeds. If formula fed, question how the formula is mixed.
- Ask how the parent or caregiver knows when the infant is hungry and full. Ask about the types of solids being offered.
- Inquire about the eating environment.
- Discuss age-appropriate foods and the general eating behaviors/problems that can lead to inadequate calorie intake.

Infants assessed with this risk factor are considered **High Risk** and must be referred to the Nutritionist for further assessment and nutrition counseling.

Low Birth Weight and Very Low Birth Weight

Low birth weight is defined as an infant weighing ≤ 5 lb. 8 oz. at birth (≤ 2500 grams). Very low birth weight is defined as an infant weighing ≤ 3 lb. 5 oz. at birth (≤ 1500 g). Infants born with a low birth weight have more health challenges than infants born with normal birth weight. Low birth weight infants can either be born small for their gestational age (SGA) or born prematurely

Low birth weight (LBW) is one of the most important biologic predictors of infant death and deficiencies in physical and mental development during childhood among those babies who survive and continues to be a strong predictor of growth in early childhood. In-

Infants and children born with LBW, particularly LBW caused by fetal growth restriction, need an optimal nutrient intake to survive, meet the needs of an extended period of relatively rapid postnatal growth, and complete their growth and development.

This low birth weight may be a result of intra uterine undernutrition. Inadequate nutrition to the uterus can be caused by any condition that interferes with the transfer of nutrients and oxygen from the mother to the baby before birth. This can happen if during pregnancy the mother smoked, had a poor diet, or if the infant had certain medical problems. Appropriate nutrition is necessary for these infants to grow and develop. Some low birth weight infants may not get enough attention from their parents or caregivers if they are too weak to cry loudly or cannot move about normally. Other infants may not get enough to eat if they are too weak to suck.

CPA Role

Education Tips and Follow Up:

- Encourage parents and caregivers to receive and follow their physician's advice on breast and formula feeding and vitamin and mineral supplements. Support parent or caregiver's plans for breast or formula feeding.
- Establish rapport with the parents or caregivers. Utilize the three step client-centered process. Ask probing questions to determine appropriate frequency of feeds and length of feeds. If formula feeding, ask how formula is being prepared.
- Parents of young infants are probably receiving more advice than most other parents; be sensitive to the fact that they may be overwhelmed by too much "good advice."
- Find out how the parent or caregiver can tell when the infant is hungry and full.
- When the parent or caregiver is getting ready to progress the infant to solids, review the signs of an infant's developmental readiness.

Infants assessed with this risk factor are considered **High Risk** and must be referred to the Nutritionist for further assessment and nutrition counseling.

Prematurity

An infant born at or before 37 weeks gestation is described as being premature. It is difficult for the premature infant who comes into the world "unfinished" to get enough nutrition to complete the rapid growth and development that would normally occur in the last weeks before birth. The premature infant's weight at birth may be appropriate for his gestational age. His nutritional needs are greater

than mature term infants because he is continuing to “catch up” in growth and development and to lay down nutrient and energy stores that are normally complete by birth. His immature feeding skills, such as sucking and swallowing, and immature digestive system, interfere with meeting these nutritional needs.

CPA Role

Education Tips and Follow Up:

- Encourage parents and caregivers to receive and follow their physician's advice on breast and formula feeding and vitamin and mineral supplements. Support parent's or caregiver's plans for breast or formula feeding.
- Establish rapport with the caregiver. Utilize the three step client-centered process. Ask probing questions to determine appropriate frequency of feeds and length of feeds. If formula feeding, ask how formula is being prepared.
- Parents of young infants are probably receiving more advice than most other parents; be sensitive to the fact that they may be overwhelmed by too much "good advice."
- Find out how the parent or caregiver can tell when the infant is hungry and full.
- When the parent or caregiver is getting ready to progress the infant to solids, their physician should review the signs of an infant's developmental readiness.

Infants assessed with this risk factor are considered **High Risk** and must be referred to the Nutritionist for further assessment and nutrition counseling.

Small for Gestational Age

Impairment of fetal growth can have adverse effects on the nutrition and health of children during infancy and childhood, including higher mortality and morbidity, slower physical growth, and possibly slower mental development. Infants who are small for gestational age (SGA) are also more likely to have congenital abnormalities and are at markedly increased risk for fetal and neonatal death, hypoglycemia, hypocalcemia, polycythemia, and neurocognitive complications of pre- and intrapartum hypoxia. Over the long term, growth-retarded infants may have permanent mild deficits in growth and neurocognitive development.

Nutrition and health interventions for infants with SGA can help minimize the adverse health and nutrition consequences associated with SGA as well as maximize the potential for subsequent catch-up growth and development among these infants.

CPA Role

Education Tips and Follow Up:

- Breastfeeding feeding should be encouraged as the feeding of choice because of all the known benefits of breastfeeding.
- Establish rapport with the caregiver to determine possible factors for the infant's size. Utilize the three-step client-centered process. Ask probing questions to determine appropriate frequency of feeds and length of feeds. If formula feeding, ask how formula is being prepared.
- Find out about the eating environment.
- Find out how they feel about their infant's growth.
- Ask what their health care provider has said.
- Ask how the parent or caregiver knows when the infant is hungry and full. Ask about the types of solids being offered.
- Discuss age-appropriate foods and the general eating behaviors/problems that can lead to inadequate calorie intake.

Infants assessed with this risk factor are considered **High Risk** and must be referred to the Nutritionist for further assessment and nutrition counseling.

Large for Gestational Age

Infant mortality rates are higher among full term infants who weigh > 4,000 g (> 9 lbs) than for infants weighing between 3,000 and 4,000 g (6.6 and 8.8 lbs). Oversized infants are usually born at term; however, preterm infants with weights high for gestational age also have significantly higher mortality rates than infants with comparable weights born at term. Large for Gestational Age (LGA) may be a result of maternal diabetes (which may or may not have been diagnosed before or during pregnancy) and may result in obesity in childhood that may extend into adult life.

Very large infants regardless of gestational age, have a higher incidence of birth injuries and congenital anomalies and developmental and intellectual retardation.

CPA Role

Education Tips and Follow Up:

- Establish rapport with the caregiver to determine possible factors for the infant's size. Utilize the three-step client-centered process. Ask probing questions to determine appropriate frequency of feeds and length of feeds. If formula feeding, ask how formula is being prepared.
- Find out about the eating environment.
- Find out how they feel about their infant's growth.
- Ask what their health care provider has said.
- Ask how the parent or caregiver knows when the infant is hungry

and full. Ask about the types of solids being offered.

- Discuss the general eating behaviors/problems that can lead to inadequate calorie intake.

Infants assessed with this risk factor are considered **Non-high Risk** and do not require a referral to the Nutritionist. However, the CPA may refer to the Nutritionist for further assessment and nutrition counseling.

√ SELF-CHECK #8

1. Name the five main categories of infant nutrition assessment risk factors:
 - a.
 - b.
 - c.
 - d.
 - e.
2. Nutrition risk factors are identified as _____ and _____ Risk.
3. _____ Risk infants must be referred to the Nutritionist for in-depth nutrition counseling.
4. _____ is an increase in the physical size of the body whereas _____ is the process of maturing.
5. True or False
 - ___a. The infant who weighs less than other infants of the same length and age may be an indication of a medical problem, a feeding problem, or may be a normal weight for that infant.
 - ___b. Short stature is not considered a nutrition risk if both parents are short.
 - ___c. Nutritional deficiencies over a long period of time may lead to growth retardation.
 - ___d. The risk of an infant growing up to become an overweight adult is related to the size of his/her parents.
 - ___e. "Overweight" infants are generally put on a weight-loss diet to avoid obesity in later life.
 - ___f. Overfeeding of formula or complementary foods for an extended period of time can cause infants to become overweight.
6. Name two possible factors associated with inadequately nourishing an infant:
 - a.
 - b.
- 7.a. An infant with a birth weight of _____ is considered low birth weight.
 - b. An infant with a birth weight of _____ is considered very low birth weight.
8. An infant is considered premature if they were born at or before ___ weeks gestation.
9. An infant with a birth weight of _____ is considered to be large for gestational age.

Biochemical Nutrition Assessment Risk Factors



There are biochemical indicators that define nutrition risk.

These include blood hemoglobin as an assessment of iron deficiency anemia and blood lead levels as an assessment of elevated lead levels. Our discussion/explanation will be limited to low hemoglobin for assessment of iron deficiency anemia. However, if the CPA feels that the infant has the potential for lead exposure, referral to the family's physician should be made.

Anemia

The most common form of nutrition-related anemia is iron deficiency, which can be caused by a diet inadequate in iron. Inadequate intake of iron in infancy has been found to be related to poverty, inadequate dietary intake, and malnutrition. Infants who do not receive an appropriate iron source after six months of age are at risk for developing anemia. Iron deficiency can result in poor growth, decreased resistance to infection, fatigue, irritability, behavioral problems, and deficits in cognitive ability. Appropriate iron sources include iron-fortified formula, iron-fortified cereals, meats, or oral iron supplements. Therefore, breastfed infants who are not receiving any iron rich solids after six months of age are at risk for anemia. Low birth weight infants are also at increased risk of developing anemia because of low neonatal iron stores. Infants on low iron formulas are also at risk for anemia. The Arkansas WIC Program does not permit the issuance of low iron formulas to infants unless the infant is diagnosed by a physician as having any of the following (but not limited to) conditions: hemolytic anemia, hemochromatosis, iron overload secondary to chronic blood transfusions, or inherited blood disorders, such as Thalassemia. All requests for low iron formula should be referred to the Nutrition Coordinator or designated Nutritionist.

A hemoglobin level is required to be obtained on infants between the ages of six to 12 months who are being nutritionally assessed for certification. Infants who are assessed for certification before six months are required to have a hemoglobin level obtained between nine and 12 months of age. Review the policy for infant hemoglobin checks in the WIC Policies and Procedures Manual. For WIC purposes, an infant between the ages of six to 12 months of age is at risk of anemia and considered to have low levels if they have a hemoglobin level of less than 11.0 or a hematocrit level less than 33.0.

CPA Role

Education Tips and Follow Up:

- Encourage parents and caregivers to receive and follow their physician's advice on breast and formula feeding, and vitamin and mineral supplements. Support parent's plans for breast or formula feeding.
- Recommend use of iron-fortified formula to all parents and caregivers who choose to offer formula to their infants.
- Educate parents and caregivers on the importance of offering iron-rich foods to an infant over six months of age. If the caregiver has not begun these foods, probe to understand her reasons.
- Educate parents and caregivers on sources of iron-rich foods (such as iron-fortified infant cereals, cooked dried beans [mashed], minced meats) for infants.

Infants assessed with this risk factor are considered **Non-high Risk** and do not require a referral to the Nutritionist. However, the CPA may refer to the Nutritionist for further assessment and nutrition counseling.



Clinical Nutrition Assessment Risk Factors

The clinical nutrition assessment risk factors include:

1. Failure to thrive
2. Nutrition-related medical conditions
3. Drug-nutrient interactions
4. Recent major surgery, trauma, burns
5. Infant up to 6 months old of WIC mother or of a woman who would have been eligible during pregnancy
6. Infant born of woman with mental retardation or alcohol or drug abuse during most recent pregnancy

Failure to Thrive (FTT)

Failure to thrive (FTT) is a serious growth problem with an often-complex etiology. Some of the indicators that a physician might use to diagnose FTT include:

- Weight consistently below the 3rd percentile for age;
- Weight less than 80% of ideal weight for height/age;
- Progressive fall-off in weight to below the 3rd percentile;
- A decrease in expected rate of growth along the child's previously defined growth curve irrespective of its relationship to the 3rd percentile.

Failure to Thrive may be a mild form of Protein Energy Malnutrition (PEM) that is manifested by a reduction in rate of somatic growth. Regardless of the etiology of FTT, there is inadequate nutrition to support weight gain.

CPA Role

Education Tips and Follow-Up

- Establish rapport with the parent or caregiver to find out how they feel about their infant's growth and what their health care provider has mentioned. Utilize the three step client-centered process. Ask probing questions to determine appropriate frequency of feeds and length of feeds. If formula fed, question how the formula is mixed.
- Ask how the parent or caregiver knows when the infant is hungry and full. Ask about the types of solids being offered.
- Inquire about the eating environment.
- Discuss age-appropriate foods and the general eating behaviors/problems that can lead to inadequate calorie intake.

Infants assessed with this risk factor are considered **High Risk** and must be referred to the Nutritionist for further assessment and nutrition counseling.

Nutrition-Related Medical Conditions, Drug-Nutrient Interactions, Recent Major Surgery, Trauma, Burns

Nutrition Related Medical Conditions

- **Cancer**
- **Celiac Disease**
- **Central Nervous System Disorders**
- **Developmental Delays, Sensory or Motor Delays Interfering with the Ability to Eat**
- **Diabetes Mellitus**
- **Fetal Alcohol Syndrome**
- **Food Allergies**
- **Gastrointestinal Disorders**
- **- Genetic and Congenital Disorders**
- **Hypertension**
- **Hypoglycemia**
- **Inborn Errors of Metabolism**
- **Infectious Disease**
- **Lactose Intolerance**
- **Nutrient Deficiency Diseases**
- **-- Pyloric Stenosis**
- **Renal Disease**
- **Thyroid Disorders**
- **Other Medical Conditions**

There are only certain medical conditions that can be used as nutrition risk factors. A medical problem is a nutrition risk factor if it causes, contributes to, or results from an inability to obtain adequate nutrition for growth and development or the maintenance of health of the infant. The condition must have been diagnosed by a physician (as self-reported by the caregiver); or be reported or documented by a physician, or someone working under physician's orders.

Some of these conditions interfere with eating a large variety of foods such as a wheat allergy (which may prevent eating not only many foods from the grain group, but many other foods containing wheat). Other conditions change the need for nutrients or energy so that they are significantly above or below the normal requirement for the participant's age. Examples of these conditions include severe burns, cancer, heart disease, and some kinds of cerebral palsy. Some medical conditions require special diets, varied timing for when to start solids, nutrition supplements, eating equipment, or medications. For example, special diets are usually prescribed for diabetes and certain metabolic disorders. Participants with cystic fibrosis and celiac disease often use nutrition supplements and medications. Participants with severe cerebral palsy or cleft palate may use specially adapted eating utensils.

CPA Role

Education Tips and Follow Up:

- Establish rapport with the parent or caregiver to develop trust between them and you. Utilize the three step client-centered process to illicit their concerns/needs.
- Determine if their health care provider requires a special diet for the infant and how you can support the diet if applicable.
- Offer information on the progression of the diet in infancy and educate on general feeding relationship behaviors if appropriate.

Infants assessed with any of these risk factors are considered **High Risk** and must be referred to the Nutritionist for further assessment and nutrition counseling.



Infant up to 6 Months old of WIC Mother or of a Woman Who Would Have Been Eligible During Pregnancy

These risk factor can be defined as: An infant less than six months of age whose mother was a WIC Program participant during pregnancy or whose mother's medical records document that the woman was at nutritional risk during pregnancy because of detrimental or abnormal nutritional conditions detectable by biochemical or anthropometric measurements or other documented nutritionally related medical conditions.

WIC participation during pregnancy is associated with improved pregnancy outcomes. An infant whose nutritional status has been adequately maintained through WIC services during gestation and early infancy may decline in nutritional status if without these services and return to a state of elevated risk for nutrition related health problems. Infants whose mothers were at medical/nutritional risk during pregnancy, but did not receive those services, may also be thought of as a group at elevated risk for morbidity and mortality in the infant period.

WIC participation in infancy is associated with lower infant mortality, decreased anemia for infants and improvements in growth (head circumference, height and weight). Infants on WIC are more likely to consume iron-fortified formula and cereal and less likely to consume cow's milk before one year, thus lowering the risk of developing iron deficiency anemia

CPA Role

Education Tips and Follow Up:

- Establish rapport with the parent or caregiver to develop trust between them and you. Utilize the three-step client-centered process to illicit their concerns/needs.
- Ask probing questions to determine appropriate frequency of feeds and length of feeds, etc. Utilize the Infant Nutrition Education Plan for counseling.

Infants assessed with this risk factor are considered **Non-high Risk** and do not require a referral to the Nutritionist. However, the CPA may refer to the Nutritionist for further assessment and nutrition counseling.



Infant Born of a Woman with Mental Retardation or Alcohol or Drug Abuse during Most Recent Pregnancy

Cognitive limitation in a parent or primary caretaker has been recognized as a risk factor for failure to thrive (FTT) as well as for abuse and neglect. The caretaker may not exhibit the necessary parenting skills to promote beneficial feeding interactions with the infant. Maternal mental illnesses such as severe depression and maternal chemical dependency also represent social risk factors for FTT. Chemical dependency is also strongly associated with abuse and neglect. In many cases parents or caretakers reported for child abuse are active substance abusers. These maternal conditions may contribute to a lack of synchrony between the infant and mother during feeding and therefore interfere with the infant's growth process. Nutrient intake depends on the synchronization of maternal and infant behaviors involved in feeding interactions.

CPA Role

Education Tips and Follow Up:

- Establish rapport with the parent or caregiver to develop trust between them and you..
- Ask probing questions to determine appropriate frequency of feeds and length of feeds, etc. Utilize the three-step client-centered process to illicit concerns and needs. Utilize the Infant Nutrition Education Plan for counseling.

Infants assessed with this risk factor are considered **Non-high Risk** and do not require a referral to the Nutritionist. However, the CPA may refer to the Nutritionist for further assessment and nutrition counseling.

√ SELF-CHECK #9

1. The most common form of nutrition-related anemia is _____.

True or False

2. A hemoglobin level is required to be obtained on all infants under 6 months of age who are being nutritionally assessed for WIC certification.
3. A nine-month-old infant with a hemoglobin of 10.9 g/dl must be referred to the Nutritionist for High Risk counseling.
4. A nutrition-related medical problem is a risk factor if it causes, contributes to or results from an inability to obtain adequate nutrition for growth and development or the maintenance of health of the infant.
5. Maternal chemical dependency represents social risk factors for Failure to Thrive (FTT) in infants.

6. Name one indicator a physician might use to diagnose Failure to Thrive (FTT).

7. WIC participation in infancy is associated with what three things:
- a.
 - b.
 - c.

Dietary Nutrition Assessment Risk Factors



Food choices can have short- and long-term effects on health status. These effects may be seen during the WIC assessment as other nutritional status indicators, such as altered body weight, growth pattern, or hemoglobin level. When such conditions are identified, it is logical to look for clues related to foods consumed. For example, an inappropriate infant feeding practice like putting cereal in the bottle could explain an infant's rapid weight gain.

The dietary nutrition assessment risk factors in this category include:

1. Inappropriate nutrition practices for infants
 - a. Routinely using a substitute for breastmilk or FDA-approved iron-fortified formula as the primary nutrient source.
 - b. Routinely using nursing bottles or cups improperly.
 - c. Routinely offering complementary foods or other substances that are inappropriate in type or timing.
 - d. Routinely using feeding practices that disregard the developmental needs or stage of the infant.
 - e. Feeding foods to an infant that could be contaminated with harmful microorganisms or toxins.
 - f. Routinely feeding inappropriately diluted formula
 - g. Routinely limiting the frequency of nursing of the exclusively breastfed infant when breastmilk is the sole source of nutrients.
 - h. Routinely feeding a diet very low in calories or essential nutrients.
 - i. Routinely using inappropriate sanitation in preparation, handling, and storage of expressed breastmilk or formula.
 - j. Feeding dietary supplements with potentially harmful consequences
 - k. Routinely not providing dietary supplements recognized as essential by national public health policy when an infant's diet alone cannot meet nutrient requirements.
2. Dietary risk associated with complementary feeding practices.
3. Breastfeeding complications.
4. Breastfeeding infant of woman at nutritional risk.

Inappropriate Nutrition Practices for Infants

This risk factor involves the routine use of feeding practices that may result in impaired nutrient status, disease, or health problems. These practices, with examples, are outlined in the following table:

Inappropriate Nutrition Practices for Infants	Examples of Inappropriate Nutrition Practices (including but not limited to)
<p>Routinely using a substitute(s) for breast-milk or for FDA approved iron-fortified formula as the primary nutrient source during the first year of life.</p>	<p>Examples of substitutes:</p> <ul style="list-style-type: none"> ▪ Low iron formula without iron supplementation; ▪ Cow’s milk, goat’s milk, or sheep’s milk (whole, reduced fat, low-fat, skim), canned evaporated or sweetened condensed milk; and ▪ Imitation or substitute milks (such as rice- or soy-based beverages, non-dairy creamer), or other “homemade concoctions.”
<p>Routinely using nursing bottles or cups improperly.</p>	<ul style="list-style-type: none"> ▪ Using a bottle to feed fruit juice. ▪ Feeding any sugar-containing fluids, such as soda/soft drinks, gelatin water, corn syrup solutions, sweetened tea. ▪ Allowing the infant to fall asleep or be put to bed with a bottle at naps or bedtime. ▪ Allowing the infant to use the bottle without restriction (e.g., walking around with a bottle) or as a pacifier. ▪ Propping the bottle when feeding. ▪ Allowing an infant to carry around and drink throughout the day from a covered or training cup. ▪ Adding any food (cereal or other solid foods) to the infant’s bottle.
<p>Routinely offering complementary foods* or other substances that are inappropriate in type or timing.</p> <p><i>*Complementary foods are any foods or beverages other than breastmilk or infant formula.</i></p>	<p>Examples of inappropriate complementary foods:</p> <ul style="list-style-type: none"> ▪ Adding sweet agents such as sugar, honey, or syrups to any beverage (including water) or prepared food, or used on a pacifier; and ▪ Any food other than breastmilk or iron-fortified infant formula before 4 months of age.
<p>Routinely using feeding practices that disregard the developmental needs or stage of the infant.</p>	<ul style="list-style-type: none"> ▪ Inability to recognize, insensitivity to, or disregarding the infant’s cues for hunger and satiety (e.g., forcing an infant to eat a certain type and/or amount of food or beverage or ignoring an infant’s hunger cues). ▪ Feeding foods of inappropriate consistency, size, or shape that put infants at risk of choking. ▪ Not supporting an infant’s need for growing independence with self-feeding (e.g., solely spoon-feeding an infant who is able and ready to finger-feed and/or try self-feeding with appropriate utensils). ▪ Feeding an infant foods with inappropriate textures based on his/her developmental stage (e.g., feeding primarily pureed or liquid foods when the infant is ready and capable of eating mashed, chopped or appropriate finger foods).

Inappropriate Nutrition Practices for Infants	Examples of Inappropriate Nutrition Practices (including but not limited to)
Feeding foods to an infant that could be contaminated with harmful microorganisms or toxins. (continued)	Examples of potentially harmful foods: <ul style="list-style-type: none"> ▪ Unpasteurized fruit or vegetable juice; ▪ Unpasteurized dairy products or soft cheeses such as feta, Brie, Camembert, blue-veined, and Mexican-style cheese; ▪ Honey (added to liquids or solid foods, used in cooking, as part of processed foods, on a pacifier, etc.); ▪ Raw or undercooked meat, fish, poultry, or eggs; ▪ Raw vegetable sprouts (alfalfa, clover, bean, and radish); ▪ Undercooked or raw tofu; and ▪ Deli meats, hot dogs, and processed meats (avoid unless heated until steaming hot).
Routinely feeding inappropriately diluted formula.	<ul style="list-style-type: none"> ▪ Failure to follow manufacturer’s dilution instructions (to include stretching formula for household economic reasons). ▪ Failure to follow specific instructions accompanying a prescription.
Routinely limiting the frequency of nursing of the exclusively breastfed infant when breastmilk is the sole source of nutrients.	Examples of inappropriate frequency of nursing: <ul style="list-style-type: none"> ▪ Scheduled feedings instead of demand feedings; ▪ Less than 8 feedings in 24 hours if less than 2 months of age; and ▪ Less than 6 feedings in 24 hours if between 2 and 6 months of age.
Routinely feeding a diet very low in calories and/or essential nutrients.	Examples: <ul style="list-style-type: none"> ▪ Vegan diet; ▪ Macrobiotic diet; and ▪ Other diets very low in calories and/or essential nutrients.
Routinely using inappropriate sanitation in preparation, handling, and storage of expressed breastmilk or formula.	Examples of inappropriate sanitation: <ul style="list-style-type: none"> ▪ Limited or no access to a: <ul style="list-style-type: none"> – Safe water supply (documented by appropriate officials), – Heat source for sterilization, and/or – Refrigerator or freezer for storage. ▪ Failures to properly prepare, handle, and store bottles or storage containers of expressed breastmilk or formula.
Feeding dietary supplements with potentially harmful consequences.	Examples of dietary supplements, which when fed in excess of recommended dosage, may be toxic or have harmful consequences: <ul style="list-style-type: none"> ▪ Single or multi-vitamins; ▪ Mineral supplements; and ▪ Herbal or botanical supplements/remedies/teas.
Routinely not providing dietary supplements recognized as essential by national public health policy when an infant’s diet alone cannot meet nutrient requirements.	<ul style="list-style-type: none"> ▪ Infants who are 6 months of age or older who are ingesting less than 0.25 mg of fluoride daily when the water supply contains less than 0.3 ppm fluoride. ▪ Breastfed infants who are ingesting less than 500 mL (16.9 ounces) per day of vitamin D-fortified formula and are not taking a supplement of 200 IU of vitamin D.

Inappropriate Nutrition Practices for Infants	Examples of Inappropriate Nutrition Practices (including but not limited to)
Routinely not providing dietary supplements recognized as essential by national public health policy when an infant’s diet alone cannot meet nutrient requirements. (continued)	<ul style="list-style-type: none"> ▪ Non-breastfed infants who are ingesting less than 500 mL (16.9 ounces) per day of vitamin-D fortified formula and are not taking a supplement of 200 IU of vitamin D.

CPA Role

Education Tips and Follow-Up

- Once a parent or caregiver indicates that they are feeding their infant in a way that puts their infant at nutrition or health risk, staff must ask probing questions to gather more information.
- Use the three step client-centered counseling process in soliciting information.
For example, staff will want to determine why the caregiver is practicing a certain feeding behavior.
 - *“I see that you haven’t begun feeding Johnny solids yet. Would you tell me more about why you are choosing to wait?”*
 - *“You’ve mentioned that you put cereal in Johnny’s bottle. What have you heard about offering cereal in the bottle?”*

Staff can ask questions to find out what the caregiver is planning for the infant’s successive months of feeding.

- *“I see that you are feeding Tanisha all types of baby foods now. What are you thinking of doing next to progress her eating skills?”*

Staff may also need to inquire about the eating environment and feeding relationship.

- *“I see that you are propping the bottle for your baby. How do you typically feed him?”*

This way, if the parent or caregiver states they usually hold the baby, you can praise them for what they are doing right and then provide education on the reasons why propping the bottle is not a good practice.

The CPA should provide information about the specific risks for each practice. WIC staff are in a unique role to be able to provide anticipatory guidance (or telling parents what to expect next) on feeding and developmental stages. Staff can provide guidance and information on topics such as the caregiver’s role in feeding, intro-

ducing new foods, nutrient adequacy, how to prepare formula properly, etc. Educate the parent or caregiver on appropriate feeding practices incorporating best practices discussed in this module. Listen to the parent or caregiver to learn what they would like to work on. Negotiate a plan that works toward healthier feeding habits. Find out what might or might not be helpful with carrying out the plan. Work together with the parent or caregiver to find a solution. Once the plan has been developed to a comfort level for the parent or caregiver, confirm the parent or caregiver understands and agrees with the plan. Provide the parent or caregiver with a related pamphlet to help reinforce the message.

Infants assessed with this risk factor are considered **Non-high Risk** and do not require a referral to the Nutritionist. However, the CPA may refer to the Nutritionist for further assessment and nutrition counseling.



Dietary Risk Associated with Complementary Feeding Practices

An infant or child who has begun to or is expected to begin to 1) consume complementary foods and beverages, 2) eat independently, 3) be weaned from breastmilk or infant formula, or 4) transition from a diet based on infant/toddler foods to one based on the *Dietary Guidelines for Americans*, is at risk of inappropriate complementary feeding. See section, Complementary Foods, page 28 of this module for more on transitioning to complementary foods.

The WIC Program plays a key role not only in the **prevention** of nutrition-related health problems, but also in the **promotion** of lifelong healthy eating behaviors. The process of introducing complementary foods provides a unique opportunity for WIC staff to assist caregivers in making appropriate feeding decisions for young children that may have lifelong implications.

CPA Role

Education Tips and Follow-Up

- Establish rapport with the parent or caregiver to find out how they feel about their infant's growth and what their health care provider has mentioned.
- Utilize the three step client- centered process. Ask probing questions to determine appropriate introduction to complementary foods.
- Ask how the parent or caregiver knows when the infant is hungry and full. Ask about the types of complementary foods being offered.
- Inquire about the eating environment.

- Discuss age-appropriate foods and general eating behaviors/problems that can occur.

Infants assessed with this risk factor are considered **Non-high Risk** and do not require a referral to the Nutritionist. However, the CPA may refer to the Nutritionist for further assessment and nutrition counseling.

Breastfeeding Complications:

- Jaundice
- Weak or ineffective suck
- Difficulty latching onto mother's breast
- Inadequate stooling (for age, as determined by a physician or other health care professional) and /or less than 6 wet diapers per day

Breastfeeding Complications

Breastfeeding is an association between two people which, like any other intimate relationship, may take some negotiating and managing if it is to work out well for both parties. The fact that problems occur is no sign that breastfeeding is going poorly, but rather a common part of the process that can be taken in stride as mother and baby work out their system. This nutrition risk factor identifies those infants who may have problems or potential problems that can put them at nutrition risk.

The breastfeeding complications are listed in the text box in the left margin. Refer to the *WIC Competency Based Training Module Level II - Breastfeeding Competency Based Training for CPAs* for more information on managing breastfeeding problems.

CPA Role

Education Tips and Follow-up

- Establish rapport with the breastfeeding mom. Utilize the three step client-centered process. Ask probing questions to determine appropriate frequency of feeds and length of feeds, etc.
- Use Tip Sheet #603 for assessment of complications and management counseling strategies.
- Refer to your LHU Breastfeeding Resource and/or the Regional Breastfeeding Coordinator for assistance in assisting the breastfeeding mom and infant in resolving the problem(s).

Infants assessed with this risk factor are considered **High Risk** and must be referred to the Nutritionist for further assessment and nutrition counseling.

Breastfeeding Infant of Woman at Nutritional Risk.

A breastfed infant is dependent on the mother's milk as the primary source of nutrition. Lactation requires the mother to consume an additional 500 calories per day (approximately) as well as increased protein, calcium, and other vitamins and minerals. Inadequate maternal nutrition may result in decreased nutrient content of the breast-

milk. Special attention should therefore be given to the health and nutritional status of breastfed infants whose mothers are at nutritional risk.

CPA Role

Education Tips and Follow Up:

- Establish rapport with the parent or caregiver to develop trust between them and you..
- Ask probing questions to determine appropriate frequency of feeds and length of feeds, etc. Utilize the three-step client-centered process to illicit concerns and needs. Utilize the Infant Nutrition Education Plan for counseling.

Infants assessed with this risk factor are considered **Non-high Risk** and do not require a referral to the Nutritionist. However, the CPA may refer to the Nutritionist for further assessment and nutrition counseling.

√ SELF-CHECK #10

Match the Nutrition Practice with the corresponding Risk Factor.

Nutrition Practice

Risk Factor

_____1. Feeding whole grapes to infant

a. Routinely using a substitute(s) for breastmilk or for FDA approved iron-fortified formula as the primary nutrient source during the first year of life.

_____2. Adding Karo syrup to formula

b. Routinely using nursing bottles or cups improperly.

_____3. Propping the bottle in the infant's mouth

c. Routinely offering complementary foods* or other substances that are inappropriate in type or timing.

_____4. Feeding a vegan diet

d. Feeding foods to an infant that could be contaminated with harmful microorganisms or toxins.

_____5. Feeding solids from a bottle

e. Routinely feeding a diet very low in calories and/or essential nutrients.

_____6. Feeding cow's milk

f. Routinely using feeding practices that disregard the developmental needs or stage of the infant.

7. True False Problems in breastfeeding are a sign that breastfeeding is going poorly.

8. Which statements are considered breastfeeding complications?

a. _____ fussy baby

d. _____ constipation

b. _____ jaundice

e. _____ inadequate stooling for age

c. _____ weak or ineffective suck



Environmental and Family Factors Nutrition Assessment Risk Factors

Lastly, there are conditions that predispose infants to inadequate nutrition patterns by virtue of their home environment and family factors. These nutrition risk factors include:

1. Homelessness
2. Migrancy
3. Recipient of Abuse
4. Woman or infant/child of primary caregiver with limited ability to make feeding decisions and/or prepare food.
5. Exposure to environmental tobacco smoke.

Homelessness

Homelessness can be defined as a woman, infant or child who lacks a fixed and regular nighttime residence; or whose primary nighttime residence is:

- a supervised publicly or privately operated shelter (including a welfare hotel, a congregate shelter, or a shelter for victims of domestic violence) designed to provide temporary living accommodations;
- an institution that provides a temporary residence for individuals intended to be institutionalized;
- a temporary accommodation of not more than 365 days in the residence of another individual; or
- a public or private place not designed for, or ordinarily used as, a regular sleeping accommodation for human beings.

Homeless individuals comprise a very vulnerable population with many special needs. WIC Program regulations specify homelessness as a predisposing nutrition risk condition. Today's homeless population contains a sizeable number of women and children – over $\frac{1}{3}$ of the total population in the U.S. studies show 43% of today's homeless are families, and an increasing number of the “new homeless” include economically-displaced individuals who have lost their jobs, exhausted their resources, and recently entered into the ranks of the homeless and consider their condition to be temporary.

CPA Role

Education Tips and Follow Up

- Providing effective and appropriate nutrition education to individuals who have a transient lifestyle requires that staff have an understanding of the participant's transient lifestyle. It is important to identify the caregiver's ability to provide regular healthy meals to the infant. Because a participant may only be enrolled for a short period of time, ongoing, long-term education goals may not be appropriate. Priority topics to be covered include:

(1) how to use the WIC check, (2) what are WIC-allowable foods, and (3) referral to other services.

- Work with the caregiver to select a food package that will fit her ability to store and prepare food. Ready-to-use formula may be necessary for the homeless infant or the infant of a woman with limited ability to prepare food who is not breastfed.

Infants assessed with this risk factor are considered **Non-high Risk** and do not require a referral to the Nutritionist. However, the CPA may refer to the Nutritionist for further assessment and nutrition counseling.



Migrancy

An infant who is a member of a family which contains at least one individual whose principal employment is in agriculture on a seasonal basis, who has been so employed within the last 24 months, and who establishes, for the purposes of such employment, a temporary abode is categorized as a migrant.

Data on the health and/or nutritional status of migrants indicate significantly higher rates or incidence of infant mortality, malnutrition, and parasitic disease (among migrant children) than among the general population. Therefore, migrancy has long been stipulated as a condition that predisposes persons to inadequate nutritional patterns or nutritionally related medical conditions.

CPA Role

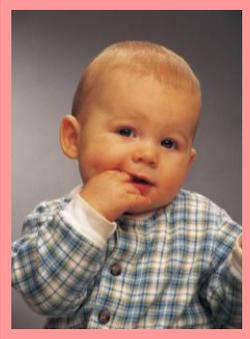
Education Tips and Follow-Up

Many migrants have participated in WIC Programs in other states where food delivery, allowable foods, and the design of the food instrument are very different. Therefore, priority topics for education should include:

- how to use the WIC food instruments
 - allowable WIC foods
 - how to use the WIC foods
 - referral to other services
- Providing effective and appropriate nutrition education to individuals who have a transient lifestyle requires that staff have an understanding of the participant's transient lifestyle. It is important to identify the caregiver's ability to provide regular healthy meals to the infant. Because a participant may only be enrolled for a short period of time, ongoing, long-term education goals may not be appropriate.
 - Work with the parent or caregiver to select a food package that will fit their ability to store and prepare food.

Infants assessed with this risk factor are considered **Non-high Risk**

and do not require a referral to the Nutritionist. However, the CPA may refer to the Nutritionist for further assessment and nutrition counseling.



Recipient of Abuse

This risk factor is defined as follows: child abuse/neglect within past 6 months as self-reported, or as documented by a social worker, health care provider or on other appropriate documents, or as reported through consultation with a social worker, health care provider, or other appropriate personnel. Child abuse/neglect is further defined as any recent act or failure to act resulting in imminent risk of serious harm, death, serious physical or emotional harm, sexual abuse, or exploitation of an infant or child by a parent or caretaker.

Arkansas Department of Health policy requires any person who has reasonable cause to suspect a child is being maltreated to report such suspicions. Suspicion of maltreatment is sufficient cause to make a report. Cases of suspected maltreatment must be reported to the Child Abuse Hotline at 1-800-482-5964 for investigation.

Serious neglect and physical emotional or sexual abuse have short- and long-term physical, emotional and functional consequences. Nutrition neglect is the most common cause of poor growth in infancy and may account for as much as half of all cases of nonorganic failure to thrive. The provision of the nutritionally dense foods and education about appropriate feeding practices by WIC is especially important for those infants with nonorganic failure to thrive.

CPA Role

Education Tips and Follow-Up

- Follow ADH policy regarding suspected child maltreatment.
- Establish rapport with the parent or caregiver to find out how they feel about their infant's growth and what their health care provider has mentioned. Utilize the three step client-centered process. Ask probing questions to determine appropriate frequency of feeds and length of feeds. If formula fed, question how the formula is mixed.
- Ask how the parent or caregiver knows when the infant is hungry and full. Ask about the types of solids being offered.
- Inquire about the eating environment.
- Discuss age-appropriate foods and the general eating behaviors/problems that can lead to inadequate calorie intake.
- Make necessary referrals to for medical and/or social services.

Infants assessed with this risk factor are considered **Non-high Risk**

and do not require a referral to the Nutritionist. However, the CPA may refer to the Nutritionist for further assessment and nutrition counseling.



Woman or Infant/Child of Primary Caregiver with Limited Ability to Make Feeding Decisions and/or Prepare Food.

This risk factor is defined as a Woman (**pregnant, breastfeeding, or non-breastfeeding**), or infant/child whose primary caregiver is assessed to have a limited ability to make appropriate feeding decisions and/or prepare food. Examples may include individuals who are:

- ≤ 17 years of age;
- mentally disabled/delayed and/or have a mental illness such as clinical depression (diagnosed by a physician or licensed psychologist);
- physically disabled to a degree which restricts or limits food preparation abilities; or
- currently using or having a history of abusing alcohol or other drugs .

The mother or caregiver ≤ 17 years of age generally has limited exposure and application of skills necessary to care for and feed a total dependent. Cognitive limitation in a parent or primary caregiver has been recognized as a risk factor for failure to thrive, as well as for abuse and neglect. The mentally handicapped caregiver may not exhibit the necessary parenting skills to promote beneficial feeding interactions with the infant. Maternal mental illnesses such as severe depression and maternal chemical dependency are also strongly associated with abuse and neglect. In 22 states, 90% of caregivers reported for child abuse are active substance abusers. Certain physical handicaps such as blindness, para- or quadriplegia, or physical anomalies restrict/limit the caregiver's ability to prepare and offer a variety of foods. Education, referrals and service coordination with WIC will aid the mother/caregiver in developing skills, knowledge and/or assistance to properly care for a total dependent.

CPA Role

Education Tips and Follow-Up

- Establish rapport with the parent or caregiver to find out how they feel about their infant's growth and what their health care provider has mentioned. Utilize the three step client-centered process. Ask probing questions to determine appropriate frequency of feeds and length of feeds. If formula fed, question how the formula is mixed.

- Ask how the parent or caregiver knows when the infant is hungry and full. Ask about the types of solids being offered.
- Inquire about the eating environment.
- Discuss age-appropriate foods and the general eating behaviors/problems that can lead to inadequate calorie intake.
- Make necessary referrals for medical and/or social services that can improve parenting skills.

Exposure to Environmental Tobacco Smoke

Environmental tobacco smoke (ETS) exposure is defined (for WIC eligibility purposes) as exposure to smoke from tobacco products inside the home. The question to ask to determine exposure to ETS is “Does anyone living in your household smoke inside the home?”

Infants born to women exposed to ETS during pregnancy have a small decrease in birth weight and a slightly increased risk of intra-uterine growth retardation compared to infants of unexposed women. Studies suggest that the health effects of ETS exposure at a young age could last into adulthood. These include cancer, specifically lung cancer, and cardiovascular diseases. There is strong evidence that ETS exposure to the fetus and/or infant results in permanent lung damage. Also, lower Vitamin C levels have been observed in nonsmokers who are regularly exposed to tobacco smoke.

The WIC food package for infants supplements their intake of vitamin C through vitamin C fortified juice (after October 1, 2009, juice will no longer be issued but infant fruits and vegetables will be). In addition, many WIC State Agencies participate in the WIC Farmers’ Market Nutrition Program, which provides coupons for participants to purchase fresh fruits and vegetables. WIC Program benefits also include counseling to increase fruit and vegetable consumption, and to promote a healthy lifestyle, such as protecting participants and their children from ETS exposure.

CPA Role

Education Tips and Follow-Up

This is what we know about secondhand (ETS) smoke:

- There is no safe amount of secondhand smoke. Breathing even a little secondhand smoke can be dangerous.
- Breathing secondhand smoke is a known cause of sudden infant death (SIDS).
- Secondhand smoke causes heart disease and lung cancer
- Separate “no smoking” sections DO NOT protect you from secondhand smoke. Neither does filtering the air or opening a window.

- Establish rapport with the parent or caregiver to find out how they feel about their infant's growth and what their health care provider has mentioned. Utilize the three step client-centered process. Ask probing questions to determine who in the household smokes and where they smoke.
- Make necessary referrals for medical and/or social services and/or counseling and tobacco cessation programs as appropriate.

Infants assessed with this risk factor are considered **Non-high Risk** and do not require a referral to the Nutritionist. However, the CPA may refer to the Nutritionist for further assessment and nutrition counseling.

√ SELF-CHECK #11

1. Mark the following statements that accurately reflect the definition of an infant who is considered homeless with an “H” and an “M” for migrant:
 - a. an infant who lacks a fixed and regular night time residence
 - b. an infant whose primary night time residence is a temporary accommodation in the residence of another individual not exceeding 365 days
 - c. an infant who is a member of a family which contains at least one individual whose principal employment is in agriculture on a seasonal basis, who has been so employed within the last 24 months
 - d. an infant with a temporary abode due to a family member whose principal employment is in agriculture for the last 24 months
 - e. an infant whose primary night time residence is an institution that provides a temporary residence for individuals intended to be institutionalized
 - f. an infant whose primary night time residence is a shelter for victims of domestic violence and designated to provide temporary living accommodations

2. True or False Arkansas Department of Health policy requires any person who has reasonable cause to suspect a child is being maltreated to report such suspicions.

3. True or False Cognitive limitation in a parent or primary caregiver has been recognized as a risk factor for failure to thrive, as well as for abuse and neglect.

4. True or False Environmental tobacco smoke exposure is defined as exposure to smoke from tobacco products inside the home.



CONGRATULATIONS!

You have just finished your study of the Infant Nutrition Module.

This module is filled with a lot of information and you have worked hard to get to this point. We hope you will use this information in a positive way to help WIC families as well as your own. Remember—infants are a precious resource!



You are now ready to take the Quiz. A score of 90% or above is required for passing.



√ SELF-CHECK ANSWERS

Self-Check #1 – Answers in BOLD

1. Which of the following are reasons why breastmilk is the best milk for infants?
 - a. **It is perfectly suited to the nutritional needs of an infant.**
 - b. **Breastmilk has special substances that protect an infant against infections.**
 - c. **Breastmilk is portable and ready when needed.**
2. True or False
 - True a. Breastmilk is easily digested and nutrients are easily absorbed.
 - False b. Constipation is common among breastfed infants.
 - True c. Breastmilk is always at the correct temperature while baby is nursing.
 - True d. In cases where breastfeeding is unsuccessful, the mother should not be made to feel guilty- she should continue to receive support from the health care team.

Self-Check #2 – Answers in BOLD

1. Most formulas are packaged in three different forms: powder, concentrate and ready-to-use. Briefly describe how to mix or dilute each one.

Powder: Mixed with water in a ratio of one level scoop of formula to two ounces of water. The directions on the formula can will give the exact dilution requirements.

Concentrate: Requires dilution with water in a one-to-one ratio. Mix equal amounts of formula and water; usually 13 oz can of concentrate to 13 oz water.

Ready-to-use: Requires no preparation; no mixing, no diluting.

2. Improper dilution of infant formula can result in **very serious health problems for the infant. Formula mixed with too little water puts an excessive burden on an infant's kidneys and digestive system and may lead to dehydration. Formula mixed with too much water might not supply the calories and nutrients needed for recommended growth and may provide an overload of water or water intoxication that can be equally dangerous to the infant.**
3. Sterilization of water and bottles (until the infant is at least three months of age) and overall cleanliness during formula preparation is necessary in order to prevent **illnesses from micro-organisms.**

4. Fill in the blank:
 - a. Formula prepared from powder may be stored in the refrigerator for up to **24** hours after the formula has been mixed.
 - b. Formula prepared from concentrate may be stored in the refrigerator for up to **48** hours after the formula has been opened and mixed.
 - c. Ready-to-use formula may be stored in the refrigerator for up to **48** hours after the formula can has been opened.

Self-Check #3 – Answers in BOLD

1. Which of the following types of milk are recommended to feed an infant during the first year of life?

Iron-fortified formula

Fresh whole milk

Reduced fat, lowfat or skim milk

Sweetened condensed milk

Goat's milk

Breastmilk

2. True or False

False a. Feeding "on demand" will spoil a breastfed infant.

True b. To prevent overfeeding, a parent or caregiver should look for signs of satiety and fullness such as sealing the lips together, more interested in other things going on or hands, toes, legs, and arms open and become limp.

True c. Infants differ in the age at which they are ready to sleep through the night without feedings.

False d. Fresh and powdered milk (whole, reduced fat, lowfat, or skim) are good sources of iron for older infants.

Self-Check #4 – Answers in BOLD

1. Name the three items that are appropriate to put in an infant's bottle.

a. Breastmilk

b. Infant formula

c. Water

2. Name at least three items that should not be put in an infant's bottle.

a. Cereal

b. Juice

- c. **Sweetened liquids**
 - d. **Honey**
 - e. **Corn syrup**
3. True or False
- True** a. Feeding juice from a bottle may lead to tooth decay.
 - True** b. Feeding honey or corn syrup to an infant less than one year of age can cause botulism poisoning.
 - False** c. "Bottle propping" is a good way to feed an infant because it frees up the caregiver to do other things.
 - False** d. Only bottle fed infants need to be burped during feedings.
4. Fill in the blanks to complete the sentences accurately.
- a. When complementary foods are introduced **appropriate to the developmental stage** of the infant, nutritional requirements can be met and eating and self-feeding skills can develop properly.
 - b. Infants need a good dietary source of **iron** and **zinc** by about 6 months of age.
5. Which of the following statements are indicators of an infant's readiness to start the introduction of complementary foods?
- a. Ability to sleep through the night.
 - b. Ability of the tongue and swallowing mechanism to deal with non-liquids.**
 - c. Ability of the infant to sit up, alone or with support.**
 - d. The infant has at least two teeth.
 - e. Opens his mouth when he sees food coming.**

Self-Check #5 - Answers in BOLD

1. Which foods would be most appropriate for a six-month-old infant?
- | | | |
|-------------------------------------|-----------------------|-----------------------|
| Iron-fortified infant cereal | Strained fruit | Strained beef |
| Banana/apple dessert | Egg yolk | Apple juice |
| Strained vegetable | Whole egg | Chicken noodle dinner |
2. Which items are good sources of iron for the infant?
- | | |
|-------------------------------|----------------------------------|
| Iron-fortified formula | Fortified infant cereal |
| Strained meats | Strained fruits |
| Fresh whole milk | Cooked dried beans–mashed |
| Breastmilk | |
3. Fill in the blank to accurately complete the statement.
- Feeding a **vitamin C**-enriched food at the same time an iron-rich food is fed can increase iron absorption by the body.

4. True or False

- False a. Infants need four ounces of juice daily.
- True b. Introduce new foods to infants when they aren't overly hungry and are feeling good.
- True c. Forcing an infant to eat may lead to habits that may cause obesity later in life.

Self-Check #6- Answers in BOLD

1.

- a. The four most important nutrients for healthy teeth are:

Protein
Calcium

Phosphorus
Fluoride

- b. The American Academy of Pediatrics (AAP), the American Academy of Pediatric Dentistry (AAPD), and the CDC recommend **no fluoride supplementation** for infants less than 6 months old.
- c. Early childhood caries are caused by bacteria called **Streptococcus mutans**.

2. Name at least one way the early childhood caries-causing bacteria is spread.

Either of the following:

- a. **Sharing eating utensils**
- b. **Putting objects in an adult's mouth then into the infant's mouth (pre-chewed foods, pacifier)**

3. True or False

- a. True Infants put to bed with a bottle of formula, milk, or juice can develop tooth decay.
- b. True Good dental health practices begin early in life, even before infants have teeth.
- c. False It is acceptable to over dilute formula for two to three days for infants with constipation.

4. List four potential feeding-related causes of spitting up.

- a. **Feeding too much food at a time**
- b. **Feeding with bottle nipples with holes that are too large**
- c. **Feeding without burping the infant during feeding and after feeding**
- d. **Playing with and jostling the infant right after eating**

5. List at least three suggestions for a caregiver of an infant with colic.

Any three of the following:

- a. **Burp if needed**
- b. **Change diaper if needed**
- c. **Soothe by swaddling in a blanket**
- d. **Rocking**
- e. **Carry in an infant carrier**

Self-Check #7 – Answers in BOLD

1. Finger foods should be offered:

- a. when the infant starts to walk alone.
- b. when the infant sleeps through the night.
- c. when the infant can chew with up and down movements.**
- d. when the infant can move his/her tongue from side to side.**

2. Which of these choices of finger foods are appropriate for an older infant (eight to 12 months)?

- a. soft, peeled fruit**
- b. grapes
- c. toast pieces**
- d. crackers**
- e. popcorn
- f. peanut butter on soft bread

3. True or False:

- True** a. Many infants prefer to feed themselves with their hands and fingers rather than with utensils.
- False** b. Infants who are learning to feed themselves should be served large portions of food.
- False** c. All developmentally normal infants should be able to feed themselves by nine months of age.
- True** d. Infants eight to 12 months of age should be eating many types of complementary foods with a variety of textures and colors.
- True** e. Lifelong eating habits are formed in childhood.

4. True or False

- False** a. Weaning from the breast or bottle to a cup should take approximately one to two days.
- True** b. Weaning to a cup should begin when an infant can sit up without support and is eating complementary foods.
- False** c. Weaning to a cup should begin after 12 months of age.
- True** d. Weaning to a cup from the breast or bottle is a gradual process.
- True** e. Normal, healthy infants should not use bottles after 14 months of age.
- True** f. Infants need help holding the cup for the early weeks of cup feeding.

5. Which two choices accurately complete the following statement?

Home-prepared foods for infants

- a. can be exactly the same foods that are prepared for the rest of the family with the added salt, sugar, etc.
- b. can be stored in a freezer indefinitely
- c. are generally less expensive.**
- d. can be reheated over and over.
- e. must be prepared and stored with care to prevent contamination of the food.**

6. Fill in the blank with the correct word.

Honey or corn syrup should not be fed to infants less than one year of age because they may contain **botulinum** spores.

7. Which foods should never be given to infants because they increase the risk of choking?

Raisins

Whole hot dogs

Apple juice

Soft, ripe bananas

Whole grapes

Popcorn

Self – Check #8 – Answers in BOLD

1. Name the five main categories of infant nutrition assessment risk factors:

- a. **Anthropometric**
- b. **Biochemical**
- c. **Clinical**
- d. **Dietary**
- e. **Environmental and Family Factors**

2. Nutrition risk factors are identified as **High Risk** and **Non-high Risk**.

3. **High Risk** infants must be referred to the Nutritionist for in-depth nutrition counseling.

4. **Growth** is an increase in the physical size of the body whereas **development** is the process of maturing.

5. True or False

True a. The infant who weighs less than other infants of the same length and age may be an indication of a medical problem, a feeding problem, or may be a normal weight for that infant.

False b. Short stature is not considered a nutrition risk if both parents are short.

True c. Nutritional deficiencies over a long period of time may lead to growth retardation.

True d. The risk of an infant growing up to become an overweight adult is related to the size of his/her parents.

False e. “Overweight” infants are generally put on a weight-loss diet to avoid obesity in later life.

True b. Overfeeding of formula or solids for an extended period of time can cause infants to become overweight.

6. Name two possible factors associated with inadequately nourishing an infant:

Any two of the following:

Lack of social support for the parent or caregiver; disorganized family; depressed parent or caregiver; parent or caregiver's lack of education, health and nutrition knowledge

7.

a. An infant with a birth weight of **less than or equal to 5 lb. 8 oz.** is considered low birth weight.

b. An infant with a birth weight of **less than or equal to 3 lb. 5 oz.** is considered very low birth weight.

8. An infant is considered premature if they were born at or before **37** weeks gestation.

9. An infant with a birth weight of **greater than or equal to 9 lb.** is considered to be large for gestational age.

Self-Check #9 – Answers in BOLD

1. The most common form of nutrition-related anemia is **iron deficiency anemia**.

True False

2. **False** A hemoglobin level is required to be obtained on all infants under 6 months of age who are being nutritionally assessed for WIC certification.

3. **False** A nine-month-old infant with hemoglobin of 10.9 g/dl must be referred to the Nutritionist for High Risk counseling.

4. **True** A nutrition –related medical problem is a risk factor if it causes, contributes to or results from an inability to obtain adequate nutrition for growth and development or the maintenance of health of the infant.

5. **True** Maternal chemical dependency represents social risk factors for Failure to Thrive (FTT) in infants.

6. Name one indicator a physician might use to diagnose Failure to Thrive (FTT):

Choose any one of the following:

- **Weight consistently below the 3rd percentile for age;**
- **Weight less than 80% of ideal weight for height/age;**
- **Progressive fall-off in weight to below the 3rd percentile;**
- **A decrease in expected rate of growth along the child's previously defined growth curve irrespective of its relationship to the 3rd percentile**

7. WIC participation in infancy is associated with what three things:

a. **lower infant mortality**

b. **decreased anemia for infants**

c. **improvements in growth (head circumference, height and weight)**

Self-Check #10 – Answers in BOLD

Match the Nutrition Practice with the corresponding Risk Factors

Nutrition Practice

- f** 1. Feeding whole grapes to infant
- b,c,d** 2. Adding Karo syrup to formula
- b** 3. Propping the bottle in the infant's mouth
- e** 4. Feeding a vegan diet
- b** 5. Feeding solids from a bottle
- a** 6. Feeding cow's milk

Risk Factor

- a. Routinely using a substitute(s) for breast-milk or for FDA approved iron-fortified formula as the primary nutrient source during the first year of life.
- b. Routinely using nursing bottles or cups improperly.
- c. Routinely offering complementary foods* or other substances that are inappropriate in type or timing.
- d. Feeding foods to an infant that could be contaminated with harmful microorganisms or toxins.
- e. Routinely feeding a diet very low in calories and/or essential nutrients.
- f. Routinely using feeding practices that disregard the developmental needs or stage of the infant.

7. **False** Problems in breastfeeding are a sign that breastfeeding is going poorly.

8. Which statements are considered breastfeeding complications?

- a. _____ fussy baby
- b. jaundice**
- c. weak or ineffective suck**
- d. _____ constipation
- e. inadequate stooling for age**

Self-Check #11- Answers in BOLD

1. Mark the following statements that accurately reflect the definition of an infant who is considered homeless with an "H" and an "M" for migrant:
- H** a. an infant who lacks a fixed and regular night time residence
- H** b. an infant whose primary night time residence is a temporary accommodation in the residence of another individual not exceeding 365 days
- M** c. an infant who is a member of a family which contains at least one individual whose principal employment is in agriculture on a seasonal basis, who has been so employed within the last 24 months
- M** d. an infant with a temporary abode due to a family member whose principal employment is in agriculture for the last 24 months

- H** e. an infant whose primary night time residence is an institution that provides a temporary residence for individuals intended to be institutionalized
 - H** f. an infant whose primary night time residence is a shelter for victims of domestic violence and designated to provide temporary living accommodations
2. **True** Arkansas Department of Health policy requires any person who has reasonable cause to suspect a child is being maltreated to report such suspicions.
 3. **True** Cognitive limitation in a parent or primary caregiver has been recognized as a risk factor for failure to thrive, as well as for abuse and neglect.
 4. **True** Environmental tobacco smoke exposure is defined as exposure to smoke from tobacco products inside the home.