

Oregon WIC Training
Infant Formula Module



Staff Training

Oregon WIC Training Infant Formula Module

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This module has been repurposed with permission from the Texas WIC Program.

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Job Aids

- Infant Formula Decision Process
- Infant Medical formulas for Qualifying Medical Conditions
- Baby Behaviors: What is Normal and When to Refer

Participant Handouts

Common Infant Problems: Crying
Common Infant Problems: Colic
Common Infant Problems: Constipation
Common Infant Problems: Diarrhea
Common Infant Problems: Spitting Up
Common Infant Problems: Food Allergies
Common Infant Problems: Changing Your Baby to a New
Formula

Glossary

Glossary
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Training Evaluation



Getting Started

Contents

- S-1 Introduction
- S-2 Steps for Completing the Module
- S-3 Items Needed

S-1 Introduction

What you will learn

The purpose of the *Infant Formula Module* is to provide WIC staff with knowledge of infant formulas so that they will be able to successfully assist WIC participants.

After completing this module staff will be able to:

- ◆ Identify infant formulas, their differences and uses;
- ◆ Determine which formulas are appropriate for different situations;
- ◆ Instruct parents and caregivers on best practices for mixing and storage of formulas; and,
- ◆ Describe common gastrointestinal problems such as constipation, diarrhea, colic, gastroesophageal reflux, food allergies and food intolerance.

Note:

Due to the fact that formula manufacturers frequently change the names and formulations of their products, the names of formulas are included in the appendices only.

S-2 Steps for Completing the Module

- ◆ The module is yours to keep.
- ◆ Feel free to take notes, highlight or write in it.
- ◆ Use the module as a reference when you are done with it.
- ◆ Complete the module by doing one lesson or chapter at a time, depending on your work schedule.
- ◆ Ask your Training Supervisor if you need help or have more questions.
- ◆ Work together with your Training Supervisor to plan your training time.

Training Supervisor's name and phone number:



The *Infant Formula Module* contains:

- ◆ *Job Aids* – To assist you in completing the *Activities* listed in the lessons.
- ◆ *Participant Handouts* – For you to reference when counseling participants about gastrointestinal issues.
- ◆ *Glossary* – Terms that appear in **bold type** in the text are defined in the Glossary in the back of the module.
- ◆ *References* – There is a single reference list in the back of the module.

Steps:	Date Completed:
<p>1. Work with your Training Supervisor to develop a training plan and to plan your training time. Use these time estimates to help plan the time it will take to complete the module.</p> <p>Chapter 1: 1.5 hours Chapter 2: 1.5 hours</p>	
<p>2. Complete the required lessons and activities for each chapter. Write down any questions you have about the lessons and discuss them with your Training Supervisor.</p>	
<p>3. Complete the <i>Posttest</i>.</p>	
<p>4. Discuss the <i>Posttest</i> with your Training Supervisor.</p>	
<p>5. Complete the Training Module Evaluation and give it to your Training Supervisor.</p>	
<p>6. Your Training Supervisor will complete the <i>Competency Achievement Checklist</i> and print your Module Completion Certificate.</p>	

S-3 Items Needed

Items Needed to Complete the Module

- ◆ Pen or pencil and highlighter
- ◆ Job Aids & Participant Handouts – **located at the back of this module**

To complete this lesson:	You will need:
1-3 Types of Formulas	<ul style="list-style-type: none"> ◆ <i>Policy 730</i> ◆ <i>Job Aid: Infant Formula Decision Process</i> ◆ <i>Job Aid: Infant Medical Formulas for Qualifying Medical Conditions</i>
2-1 Gastrointestinal Issues	<ul style="list-style-type: none"> ◆ <i>Participant Handout: Common infant problems: crying</i> ◆ <i>Participant Handout: Common infant problems: colic</i> ◆ <i>Participant Handout: Common infant problems: constipation</i> ◆ <i>Participant Handout 57-700: Does my baby have constipation?</i> ◆ <i>Participant Handout: Common infant problems: diarrhea</i> ◆ <i>Participant Handout: Common infant problems: spitting up</i> ◆ <i>Job Aid: Baby Behaviors: What is Normal and When to Refer?</i>

To complete this lesson:	You will need:
2-2 Food Allergies and Intolerance	<ul style="list-style-type: none"> ◆ <i>Participant Handout: Common infant problems: Food Allergies</i> ◆ <i>Job Aid: Baby Behaviors: What is Normal and When to Refer?</i>
2-3 Changing Formulas	<ul style="list-style-type: none"> ◆ <i>Participant Handout: Changing Your Baby to a New Formula</i>

List of items needed that are NOT included in the module

- ◆ *Policy 730*
- ◆ *Participant Handout 57-700: Does my baby have constipation?*



Chapter 1

Contents

- 1-1 Breastmilk As the Standard
- 1-2 Infant Formula Mixing and Storage
- 1-3 Types of Formulas
- 1-4 Other Milks

Lesson Level: 1

1-1 Breastmilk as the Standard

Objectives

After completing this lesson, you will be able to:

- ◆ Identify 2 other training resources for breastfeeding information.

Overview

Human milk is recognized as the biological norm for infant feeding. WIC joins all major health authorities in recommending that all infants, with rare exceptions, receive no other food or drinks besides breastmilk for approximately the first six months of life and continue to receive breastmilk at least through the first year. Although breastfeeding is preferred, there may be exceptions or conditions when breastfeeding is not an option or is not recommended. Infant formulas provide appropriate amounts of nutrition for adequate growth and development.

Benefits of Breastmilk

There are many benefits to breastfeeding, and properties of breastmilk that will never be duplicated in infant formula. Although it is desirable for all babies to be breastfed, there are a few special conditions when breastfeeding is not recommended.

You reviewed these benefits and special conditions when you completed the *Breastfeeding Level 1 Online Course* and the *Breastfeeding Level 2 Module*. Refer to these two resources to complete the following review activity.



Activity

1. List 4 reasons why WIC recommends breastfeeding.

2. List 3 situations when breastfeeding is not recommended and formula would be used.

Use of Infant Formula

There are some situations when a breastfed baby may need extra nutrients or calories. This may be infant formula added to breastmilk or infant formula used in addition to breastfeeding. The purpose of the extra fortification or supplementation is often to support a specific health or growth need and is intended to be temporary. Mothers are encouraged to return to fully breastfeeding when the issue is resolved.



Although the WIC Program enthusiastically promotes breastfeeding with pregnant women and new moms, WIC staff fully support mothers in their infant feeding decisions. Infant formula may be used a little or a lot, and the remainder of this module provides information on the types available, preparation, safety, and the causes of common problems associated with feeding an infant.

Lesson Level: 1

1-2 **Infant Formula Mixing and Storage**

Objectives

After completing this lesson, you will be able to:

- ◆ Identify three forms of infant formulas.
- ◆ Instruct a caregiver on how to properly prepare infant formula.
- ◆ Describe the basic steps of bottle-feeding an infant.

Forms of Infant Formula

Infant formula is available in three forms: powdered, liquid concentrate, and ready-to-use/ready-to-feed. The different forms of a given formula are nearly identical in nutrient composition, but small differences may exist for technical reasons due to processing. Careful preparation and handling of infant formulas are important to ensure their safety.

Ready-to-use and liquid concentrate formulas are sterile, meaning they do not contain disease causing bacteria. Although powdered formulas are heat-treated during processing, they are not subjected to high temperatures for a sufficient amount of time to make the end product sterile.



**Powdered
formula**



**Liquid
concentrate
formula**



**Ready-to-use
formula**

Powdered formula

Powdered formula is prepared by mixing the powder with water following the directions on the can. Usually, the directions call for mixing one scoop of powder with 2 ounces of water. Be sure to use the scoop that comes with that can of formula to measure the powder and do not substitute standard measuring spoons or scoops from other formulas. Powders from different manufacturers provide slightly different amounts of nutrients per unit of volume, and scoop sizes will vary accordingly, so it is important to closely follow the manufacturer's mixing instructions on the label.

Note:

The directions on each can refer to the scoop that is included in the can.

Powdered formula is often the best choice for breastfed babies who need occasional formula because it is easy to make small amounts, and the powder can be stored for up to one month after opening. Once the powder is mixed with water, use the prepared formula within 24 hours, or according to the directions on the label.

Liquid concentrate

Liquid concentrate formula needs to be mixed with water in a 1-to-1 ratio. This means mixing one can of liquid concentrate formula with one can of water. Shake the can of liquid concentrate before the liquid is mixed with an equal amount of water. After a

can of liquid concentrate formula is opened, prepare, refrigerate, and use it within 48 hours.

Ready-to-use formula

Ready-to-use formula requires no mixing or diluting with water. It is available in bottles and/or cans of various sizes. This type of formula is usually the most expensive choice, but it may be the best choice when the water supply is questionable or when the caregiver has difficulty correctly mixing liquid concentrate or powdered formula. Shake the container of formula before pouring it into the baby bottle to mix in any mineral sediment that may have settled during storage. After a can of ready-to-use formula is opened, refrigerate and use within 48 hours.

Note:

The length of time for use of prepared liquid concentrate and ready-to-use formula vs. prepared powdered formula differs. Liquid concentrate and ready-to-use formula can be used for 48 hours after mixing, while powdered formula must be used within 24 hours of mixing. The reason for this difference has to do with the way the formula is processed. Powdered infant formulas are heat-treated during processing but they are not subjected to high temperatures for sufficient time to make the final product sterile.



Activity

1. Ask your training supervisor about situations when you might offer ready-to-use formula to a family.

Sanitation

One of the most important aspects of mixing and using formula is proper sanitation. Intestinal problems in babies are often due to poor water quality or unsafe handling of bottles or equipment rather than sensitivities to the formula itself. It is important to make sure the water comes from a safe water source and is safe for a baby.

Be sure everything is as clean as possible, including bottles, water, hands, can openers, and anything else that comes in contact with the formula. It is also important to follow guidelines for proper storage of formula both at home and away from home.

Sanitizing bottles

The safest practice during the first 3 months of life is to boil bottles and bottle parts. This is especially true when the water quality is questionable. Some health care providers (HCP) might tell parents to simply wash bottles in hot, soapy water or in the dishwasher, as this may be adequate for healthy newborns in many situations. Still, WIC advises participants to boil bottles for the first 3 months since this is the best method for killing bacteria.



To boil bottles:

- Wash all bottle parts with hot, soapy water and a bottlebrush. Be sure water passes through the nipple.
- Rinse all bottle parts in hot water. Then place all bottle parts in a large pan, cover with water, and boil for five minutes.
- Remove items from pan, place upside-down on a clean cloth or paper towel and air dry.

Sanitizing water for mixing formula

For at least the first 3 months of life, WIC recommends sanitizing water by boiling it for one minute and then allowing it to cool. Sanitize all types of water including bottled drinking water and distilled water.

For healthy infants 3 months and older, it is not necessary to sanitize the water unless a health care provider recommends it. If the water quality is poor or questionable, as in the case of well water, continue to boil the water or use bottled water.

To properly boil water:

Run cold tap water for one to two minutes before collecting the water in a clean pot or kettle.

Running the water helps reduce the amount of lead in the water in case the pipes contain lead. Never use hot water from the faucet to make baby formula or for cooking.

Bring the water to a rolling boil and boil for one minute. One minute is enough time to sanitize the water, and boiling the water for a longer time can concentrate lead in the water. Next, turn off the heat and cool the water with the lid on.

**Activity**

1. Why is it important to sanitize bottles and boil water for infants under 3 months of age?
2. In what circumstances might a parent or caregiver want to continue to take extra sanitation measures past 3 months?

Mixing Formula

It is very important to prepare infant formula properly and follow the manufacturer's instructions about how much water to add to the formula. Changing the water to formula ratio is never recommended unless a health care provider prescribes a different dilution. The following tables show guidelines for mixing formula correctly and safely.

Mixing Liquid Concentrate Formula Step-by-Step

1.		<p>Check the formula's expiration date on the label or lid to be sure it has not expired. Do not use cans that have dents, leaks, bulges, or rust spots. Also, check the formula's label for the proper dilution instructions. It is very important to add the right amount of water. Only a health care provider should prescribe a dilution that is different from the directions on the can.</p>
2.		<p>Wash hands thoroughly with soap and warm water. Using hot, soapy water, wash a pitcher, its lid, and any other utensils you will use (can opener, measuring cups, etc.). Rinse all with boiling water.</p>
3.		<p>Before opening, shake the can and rinse off the top.</p> <p>Open with a clean can opener. Mix the can of liquid concentrate formula with a can of boiled and cooled water in the clean container.</p>
4.		<p>Stir to mix thoroughly and pour into sanitized bottles</p>
5.		<p>After formula has been prepared, refrigerate and use within 48 hours. Throw away unused formula after 48 hours.</p>

Mixing Powdered Formula Step-by-Step

1.		Check the formula's expiration date on the label or lid to be sure it has not expired. Also, check the formula's label for the proper dilution instructions. It is very important to add the right amount of water. Only a health care provider should prescribe a dilution that is different from the directions on the can.
2.		Wash hands thoroughly with soap and warm water.
3.		Follow the directions on the can for measuring the water and powder. Usually, the directions are to add one unpacked level scoop of powder to 2 ounces of water. Start by measuring the sanitized water into a clean container.
4.		Next, add the correct amount of powdered formula to the water in the container. Stir or shake the mixture thoroughly. You can mix enough for a full day's supply or make smaller amounts using sanitized bottles as the mixing containers.

Mixing Powdered Formula Step-by-Step

5. 	After adding the powder, stir or shake the mixture thoroughly. Open cans of powdered formula can be stored in the can for up to 1 month, but once the powder is mixed with water and refrigerated, the prepared formula should be used within 24 hours.
6. 	Throw away unused formula after 24 hours.



Activity

1. How would you explain the steps for mixing the following:
 - A. Liquid concentrate formula:
 - B. Powdered formula:

Dilution

Another key factor in formula preparation is proper dilution. It is very important to mix the liquid concentrate or powdered formula with the right amount of water. Adding either too much or not enough water can lead to serious health problems for the infant.

Concentrating Formula to Higher Calorie Levels

Only a health care provider should prescribe a dilution or recipe that is different from the manufacturer's directions.

When prepared according to the basic instructions powdered, liquid concentrate, or ready-to-use formula will yield an infant formula that is approximately 20 calories (kcal) per ounce.

The HCP may prescribe a higher caloric concentration per ounce for infants with medical problems such as failure to thrive, cardiac or respiratory problems. Higher concentrations of formula at 22, 24 and up to 30 calories (kcal) per ounce can be achieved by decreasing the amount of water to formula ratio. It is not the role of WIC staff to recommend that a parent concentrate formula unless prescribed by the HCP.



Water Intoxication

Water intoxication occurs when an infant is fed fluids without proper amounts of sodium and other solutes. It typically occurs in formula-fed infants who are given formula that has been over-diluted with water, but it has also been known to occur with feeding excess soda, juice, or tea. This preventable condition can be life-threatening to an infant. Symptoms of the condition include irritability, sleepiness, a drop in body temperature, fluid retention, and seizures which are caused by a rapid decrease in serum (blood) sodium levels. Also, infants fed excessive water will not receive adequate calories to meet their needs for growth and development. Supplemental water is generally not recommended for healthy infants who are not yet receiving solid foods, except possibly in hot weather for formula-fed infant.

Water intoxication can result when a family is running low on formula and tries to “stretch” the formula by adding extra water. Water intoxication is serious, so always add the right amount of water to formula. WIC staff can help parents understand the dangers of giving excess water.



Activity

1. Why is it important to prepare infant formula correctly?

Feeding a Bottle of Expressed Breastmilk or Formula

Guidelines for Bottle-feeding

Parents may need to learn how to bottle-feed in a way that respects their baby's natural feeding rhythm. Parents will feel more successful if they understand normal infant growth and development, such as baby behaviors or the size of their infant's stomach at different ages. For more information on infant cues, refer to the *Baby Behaviors Online Course*.

Warming Expressed Breastmilk or Formula

Babies can drink breastmilk or formula that is either room temperature, slightly cooler, or slightly warmer. If a baby prefers a warm bottle, caregivers can warm the liquid to body temperature. The best method is to set the bottle in a pan or bowl of warm water for a few minutes, or hold it under warm tap water, and then shake the bottle after warming. A few drops of formula on the inside wrist is a good test of temperature. If it feels neither warm nor cold on the wrist, it is the right temperature for a baby.



Never use a microwave to heat expressed breastmilk or infant formula because the liquid can get hot enough to cause serious burns. Even though the outside of the bottle or several drops on the wrist may feel cool, the liquid can heat unevenly inside the bottle. Formula in bottles with disposable plastic liners can become so hot that the plastic liners can burst.

Additionally, heating breastmilk in a microwave can destroy many of the beneficial components of breastmilk.

Infant stomach size

Newborn infants' stomachs are tiny and cannot take in large volumes. Until about 4 months of age, infant stomachs can hold only small amounts of breastmilk or formula. This is one of the main reasons infants need to be fed so frequently in the first few months of life. Understanding stomach sizes of infants can help caregivers understand signs of overfeeding and/or feeding problems. Paying attention to infant cues of early fullness, e.g., pulling away from the nipple, slowing or stopping of sucking, falling asleep, etc., will help support healthy eating habits.

		
<p>Day 1</p> <p>A full-term newborn's tummy is about the size of a small cherry and holds about $\frac{1}{4}$ ounce (1 teaspoon).</p>	<p>Day 5-7</p> <p>At 1 week of age a newborn's tummy has grown to the size of a walnut and holds $\frac{3}{4}$ to 1 ounce (1-2 tablespoons).</p>	<p>Day 10-21</p> <p>After a few weeks a baby's tummy is around the size of an egg and can hold 2-3 ounces.</p> <p>By a year of age, a baby's tummy is about the size of the baby's own fist.</p>

Hold the baby in an upright position

Always hold a young baby during a feeding, rather than propping the bottle up with a pillow or blanket. Propping the bottle deprives the baby of human contact, increases the risk that the baby will inhale fluids into the lungs (**aspirate**), and can lead to tooth decay and ear infections. Holding the baby helps the parent sense behavioral cues of hunger and enriches the parent and infant bond. Hold the baby in the cradle of the arm, in an upright position so the infant's head is higher than the rest of the body. This gives the baby some control of the flow and quantity of the feeding. It also helps to prevent aspiration and can help prevent ear infections by keeping milk from backing up in the inner ear.



When babies are not held upright, the bottle is in an upside-down position. In this position, as the baby swallows, more milk is drawn into their mouth by the negative pressure created, and they have no choice but to swallow again. This makes it look like the baby is hungrily gulping down the bottle when they are actually trying to protect their airway. This can be stressful for the baby, and may lead to:

- ◆ An unpleasant feeding experience;
- ◆ Respiratory issues;
- ◆ Colic-like symptoms/reflux;
- ◆ Overfeeding;
- ◆ Feeding refusal;
- ◆ Frustration when back to breastfeeding; or
- ◆ Damage to mother's confidence.

Tilt of the bottle

How much the bottle is tilted is important when feeding an infant.

Tilt the bottle at an angle that keeps the bottle's neck and nipple filled with milk, while the baby is drinking. This helps the baby to avoid swallowing too much air, which can make the infant feel full before adequate milk has been consumed.

When the baby needs to pause, tilt the bottle such that milk does not go into baby's mouth, but don't take the bottle out of baby's mouth completely. Watch for and respond to the baby's cues. Signs of feeding stress include the following:

- ◆ Splayed fingers or toes;
- ◆ Milk spilling from the corners of the mouth;
- ◆ A worried expression on the baby's face;
- ◆ The baby is trying to turn head away or push bottle away;
- ◆ Baby stops gazing at parent; or,
- ◆ Gulping, panting or gasping sounds.

There is no need to count the baby's sucks, pausing after a certain number. Baby-led bottle-feeding puts the baby in control of the feeding, which is more like breastfeeding.

Burp the baby

A baby will naturally swallow some air during a feeding, which can lead to discomfort and irritability. This happens in both breastfed and bottle-fed infants, but it is more common when drinking from a bottle, especially if the baby is not upright. Burping the baby often during a feeding helps to release the air and keeps the baby more comfortable. Parents can try burping a bottle-fed baby during natural breaks in the infant's sucking cycle or after every 2 to 3 ounces, even if the baby does not seem uncomfortable.



Do not worry about hiccups

Hiccups are also very common in infants, and they usually bother the parents more than the baby. If hiccups happen during a feeding, wait a few minutes before finishing the feeding. Sometimes it helps to burp the baby and to change the baby's position. Also, it might help to offer feedings before a baby is extremely hungry. Many babies do not seem to be bothered by hiccups.

Do not put a baby to sleep with a bottle

Putting a baby to sleep in a crib or playpen with a bottle can lead to choking, ear infections, tooth decay, and problems with speech later on. If the parents are putting an older infant to sleep with a bottle, encourage them to put a small amount of plain water in the bottle as they work on changing this habit.

Other bottle-feeding tips for parents and caregivers

- ◆ Alternate sides when holding the baby for feeding. This encourages development of both sides of the baby's brain/body.
- ◆ Never coax a baby to finish a bottle. This may contribute to overfeeding.
- ◆ Learn what to expect in terms of feeding frequency and amounts for your baby's age.
- ◆ Pay attention and respond to the baby's cues.
- ◆ Use bottles only for breastmilk and formula. If needed, small amounts of water for older infants can be bottle-fed. Caregivers should never put juice, fruit drinks, sweetened liquids, cereal or pureed foods in a bottle.

Summary of key bottle-feeding points

- ◆ Feed baby in an upright position.
- ◆ Don't force the bottle into the baby's mouth.
- ◆ Pay close attention to the baby during the feeding. Look for signs of stress, to know when to pause the feeding.

- ◆ Tilt the bottle down during the pause, so baby is no longer getting milk, but leave the bottle in the mouth, or in contact with the lips.
- ◆ Never prop a bottle!
- ◆ Never put juice, fruit drinks, sweetened liquids, cereal or pureed foods in a bottle.



Activity

1. What would you feel is important to explain to caregivers about warming a bottle?

2. Demonstrate for your Training Supervisor how you would explain to a caregiver the key bottle-feeding points.

Storing Formula

Keep breastmilk and formula chilled when traveling

If a parent plans to take a baby on an outing (shopping, clinic appointment, etc.), the liquid in the bottles should start out very cold, and then be put in an insulated bag with an ice pack, or wrapped in a thick cloth to keep cold. For longer travel times, it is a good idea to keep bottles in a small ice chest. For formula-fed babies, other options include taking sanitized water in clean bottles along with a can of powdered formula or buying ready-to-use formula.



Throw out breastmilk or formula after a feeding

When an infant drinks from a bottle, the baby's saliva enters the bottle and mixes with the breastmilk or formula. This is not a problem during the feeding, but if the bottle is set aside, bacteria will grow and multiply, especially at room temperature. Over time the bacteria in the liquid can reach a level that can make an infant sick. After a feeding, caregivers should throw out any unused breastmilk or formula and then wash the bottle with soap and hot water.

Other Considerations**Bisphenol A (BPA)**

Some plastics are made with chemicals called phthalates or bisphenol A (BPA). These chemicals can leach from everyday plastic products like bottles, toys, containers and personal care products. Scientists and doctors are learning about these chemicals and the effects that they may have, especially on young children. Due to these health concerns, baby bottles and sippy cups manufactured since July 2012 and infant formula manufactured since July 2013 are required to be BPA free. This means that all baby bottles and sippy cups currently on the market are BPA free and all infant formula currently manufactured is in BPA free containers.

There are still other products that may contain BPA, but for infants and toddlers, BPA from bottles, sippy cups and formula should no longer be an issue. More information is located at:

<http://www.gpo.gov/fdsys/pkg/FR-2012-07-17/html/2012-17366.htm>

What to do if the caregiver runs out of formula

Since the WIC program benefits are intended to be supplemental and not intended to meet all the nutritional needs of infants, caregivers will need to obtain additional infant formula beyond what is provided by WIC. If the amount of infant formula provided by the WIC Program is insufficient to meet an infant's needs, then:

- ◆ **Offer** powdered infant formula instead of liquid concentrate or ready-to-use infant formula, since powdered infant formula has a higher yield.
- ◆ **Refer** the parent/caregiver to financial or food assistance in their community for which they may be eligible.



Activity

1. Ask your Training Supervisor about resources available in your community for helping a participant who runs out of formula.

Lesson Level: 1

1-3 Types of Formulas

Objectives

After completing this lesson, you will be able to:

- ◆ Identify the differences between milk-based and soy-based infant formulas.
- ◆ Identify three special types of formula and the reasons why they might be used.

Materials Needed

- ◆ Job Aid: *Infant Formula Decision Process*
- ◆ Job Aid: *Infant Medical Formulas for Qualifying Medical Conditions*

WIC Policy

- ◆ WIC Policy 730 – Bid Formula: Use and Description

Overview

WIC can provide many different types of formula depending on the infant's needs. WIC maintains a contract with a formula company that requires us to provide a specific brand of standard infant formula. These are called bid formulas. For more information on bid formulas, see Policy 730.

Infants who cannot tolerate the bid formula can receive a different brand of formula with medical documentation from their health

care provider. For more information on medical documentation, see Policy 765.

Most infants do well with a standard milk-based formula. This lesson will give you the basics about the different kinds of formula parents will ask about, even though Oregon WIC does not provide every type.

Nutrient Composition

All formulas provide the same basic nutrients because in 1980 the Infant Formula Act established minimum levels for 29 nutrients and maximum levels for nine others. Formulas can vary somewhat in the amount and type of a particular nutrient, but all must meet the basic requirements.

Manufacturers of standard infant formulas include:

Abbott Nutrition.....Similac brand
GerberGood Start brand
Mead Johnson Enfamil brand
PBM Nutritionals All Store brands

Note:

If a family runs out of formula, store brand formulas are a high-quality alternative and less expensive than name-brand formulas. Understanding the major nutrients in infant formulas can help a WIC staff person understand the underlying cause of an adverse reaction to a formula.

The major nutrients in infant formulas are:

- ◆ Carbohydrate
- ◆ Protein
- ◆ Fat

Formulas differ in the type of carbohydrate, protein, and fat they contain. Formulas can also vary in composition depending on whether they are powdered, concentrate, or ready-to-use.



For example, liquid concentrate and ready-to-use formulas have **emulsifiers**, such as lecithin, carrageenan, monoglycerides, or diglycerides, which prevent separation.

Standard Milk-Based Formulas

Standard milk-based formulas are the best choice for healthy, term infants who are not breastfed or are partially breastfed.

Carbohydrate

Lactose is the major carbohydrate (sugar) found in both breastmilk and standard milk-based infant formulas. Lactose is only found in the milks of mammals, such as cows, goats, and humans. Milk-based formula is derived from cow's milk which has lower lactose content than human milk. During the manufacturing process, additional lactose is added to milk-based formulas to bring the amount closer to that of human milk.

Lactose aids in the absorption of minerals, such as calcium, magnesium, and zinc and helps promote the growth of good bacteria.

Protein

The protein in standard milk-based infant formulas is derived from cow's milk protein, which has been modified to be more like breastmilk protein. Milk contains two major kinds of protein: **casein** and **whey**. Cow's milk is about 80 percent casein and 20 percent whey, while breastmilk is about 20 to 40 percent casein and 60 to 80 percent whey. Casein proteins form larger curds in the infant's stomach and are harder to digest. Some formulas have been manufactured to be higher in whey protein. Although this produces a formula that is more similar to breastmilk, the whey proteins in breastmilk are very different from the whey proteins in cow's milk.

Lactalbumin is the major whey protein found in breastmilk, whereas lactoglobulin is the major whey protein of cow's milk.

Lactoglobulin has a greater potential for causing protein allergy than lactalbumin. Some parents may think goat's milk is a good alternative if their infant is allergic to cow's milk protein, but goat's milk also contains lactoglobulin, which makes it a poor substitute for an infant formula.

Fats

Cow's milk contains butterfat, which is difficult for the infant to digest. When cow's milk-based infant formulas are produced, manufacturers remove the butterfat and replace it with vegetable oils, which are easier to digest. Vegetable oils are added in a specific amount to create a formula that is more similar to human milk. Standard milk-based infant formulas may include various combinations of fats including palm, soy, coconut, sunflower, safflower, or essential fatty acids (Omega 3 and 6).

Milk-Based Infant Formulas with Special Characteristics

Many infants go through periods of fussiness as a normal part of development. In some cases the fussiness may be accompanied by brief periods of constipation, gas or spitting up. While these are normal baby behaviors, and most infants outgrow these periods fairly quickly, formula manufacturers have designed and marketed formulas to address these issues.

Modifications to milk-based infant formulas include:

- ◆ Lactose-free or reduced-lactose formulas
- ◆ Formulas with added rice starch



Lactose-Free and Reduced-Lactose Infant Formulas

Reduced lactose formulas are milk-based infant formulas that partially or fully replace the lactose in the formula with corn maltodextrin, corn syrup and/or sucrose. According to the American Academy of Pediatrics (AAP), there is no clinical advantage to reduced lactose and lactose-free formulas as compared with standard lactose-containing formulas.

Note:

Milk-based formulas are never completely lactose-free due to the addition of prebiotics. They are approximately 99.8% percent lactose-free.

Infant Formulas with Added Rice Starch

Infant formulas with added rice starch are designed for infants who spit up due to **gastroesophageal reflux disease (GERD)**.

For more information on GERD, see Chapter 2, Lesson 1 Gastrointestinal Issues. A portion of the carbohydrate (lactose) in these formulas is replaced with a special rice starch. These formulas are slightly thicker than regular formula when prepared, and become even thicker when combined with stomach acid. Infants with reflux may spit up less on thickened formula. This added rice starch is different than adding rice cereal to regular formula. Infant formulas with added rice starch should not be given to preterm infants due to their immature digestive systems.

Note:

WIC does not recommend that parents or caregivers use cereal to thicken formula as it alters the nutrient composition.

Soy-Based Formulas

Soy-based infant formulas (soy formulas) contain protein derived from soy rather than cow's milk. Soy-based formulas are free of cow's milk protein and lactose. These formulas contain soy-protein with certain amino acids added to improve the quality of the protein and make it more like breastmilk. The fat content of soy formulas is from vegetable oils. The carbohydrate source of soy formula may be corn maltodextrin, corn syrup solids, or sucrose.



Soy formulas have been used since 1929 for infants with intolerance to milk-based formulas. New evidence is changing the

reasons why soy formulas might be recommended. The American Academy of Pediatrics' (AAP) has issued recommendations for the use of soy formulas in infant feeding which include:

1. In full term infants, soy-based formulas are indicated for use in place of milk-based formula in the following two situations: (a) for infants with **galactosemia** and hereditary lactase deficiency (rare) and (b) in situations in which a vegetarian diet is preferred.
2. For infants with documented cow milk protein allergy, extensively hydrolyzed protein formula should be considered, because 10% percent to 14% percent of these infants will also have a soy protein allergy.
3. Most previously-well infants with acute **gastroenteritis** can continue to use breastmilk or milk-based formulas after they are rehydrated. Soy-based formulas may be indicated if the infant has short term lactose intolerance as a result of the gastroenteritis.
4. There is no advantage to soy-based formula over milk-based formula as a supplement for a breastfed infant, unless the infant has one of the indications noted in item 1.
5. Soy-based formulas are not designed for or recommended for preterm infants.
6. The routine use of soy-based formula has no proven value in the prevention or management of infant colic or fussiness.
7. Infants with documented cow milk protein-induced **enteropathy** or **enterocolitis** frequently are as sensitive to soy protein and should not be given soy-based formula. They should be provided formula derived from hydrolyzed protein or synthetic amino acids.

8. The routine use of soy-based formula has no proven value in the prevention of **atopic dermatitis** in healthy or high-risk infants.



Activity

Check in with your Training Supervisor.

1. What is the current bid milk-based and soy-based formula for Oregon WIC?
2. Why does WIC use bid formulas?
3. Share 2 of the recommendations for use of soy-based formula.

Note:

Non-bid formulas are considered medical formulas and require medical documentation to be issued. Refer to the *Food Package Module* for information on medical documentation and issuing medical formulas.

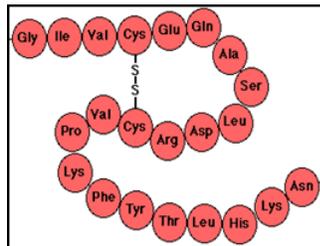
Proteins in Infant Formulas

While most infants do just fine on standard formulas, some have problems with the proteins in formula. Milk-based and soy-based formulas are made with intact proteins, meaning the protein is a long chain of **amino acids**. These intact proteins are harder for some infants to digest and are more likely to trigger allergic reactions. Some formulas have proteins that have been modified to make them easier to digest and less likely to produce an allergic reaction. **Hydrolysis** is the process by which proteins are modified to produce smaller protein particles called peptides and free amino acids. These are hydrolyzed or protein hydrolysate formulas

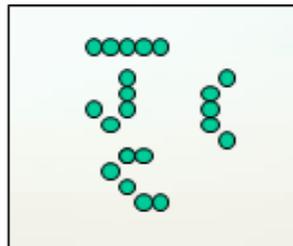
Protein hydrolysate formulas break the protein chain into shorter pieces called **peptides**. Amino acid-based elemental formulas are made from individual synthetic non-allergenic amino acids. The smaller the protein particle, the easier it will be to digest and therefore less likely to cause an allergic reaction. For this reason, you may hear of them described as hypoallergenic formulas.

Most allergenic

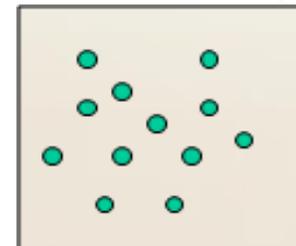
Least allergenic



All standard infant formulas (milk-based and soy-based) are made of intact protein chains that can trigger allergic reactions.



Protein hydrolysate formulas break the protein chain into pieces, peptides. Helps with tolerance, may still trigger an allergic reaction.



Amino acid-based elemental formulas are made from individual non-allergenic amino acids.

Protein Hydrolysate Formulas

Protein hydrolysate formulas can be either extensively or partially hydrolyzed and include either whey or casein protein. They are designed for infants who are unable to digest or may have an allergy to the cow's milk protein in standard infant formulas. Partially hydrolyzed formulas are available in varying proportions of casein and whey proteins. Partially hydrolyzed formulas are not recommended once an infant has developed a milk allergy because the proteins are not completely broken down and have been

known to cause allergic reactions. Oregon WIC does not provide these formulas.

The protein hydrolysate formulas that Oregon WIC provides are all extensively hydrolyzed casein formulas.

Composition of Casein Hydrolysate Formulas

Protein

Casein hydrolysate formulas are supplemented with three amino acids to provide a complete balance of protein. Although allergic reactions to casein hydrolysate formulas are rare, there are some infants who will need the proteins broken down to single amino acids.



Fat

Some casein hydrolysate formulas contain medium-chain triglycerides (MCT) as the major fat source. “Medium-chain” refers to the length of the fat molecule. MCT oils are easier to digest and absorb than fats with greater chain lengths such as corn, soy, or safflower oils. Infants and children who have a difficult time digesting and absorbing longer chain fats in foods may benefit from formulas with MCT oil.

Carbohydrate

All casein hydrolysate formulas are lactose free. Carbohydrate sources include corn maltodextrin, sucrose, corn syrup solids and modified corn starch.

Indications for Use of Casein Hydrolysate Formulas:

1. Allergies to cow’s milk proteins and soy protein
2. Infants with documented intestinal damage due to milk allergy are often equally sensitive to soy protein and should not be given soy formula routinely. They should be provided with casein hydrolysate formula.
3. Gastroesophageal reflux disease (GERD)
4. Malabsorption

5. Casein hydrolysate formulas that contain MCT oil are appropriate for conditions such as **short bowel syndrome, pancreatic insufficiency, cholestasis, and cystic fibrosis.**
6. Possible prevention of milk allergy for infants with a strong family history of allergies.

Note:

There is no evidence to support the use of casein hydrolysate formula in the treatment of colic, sleeplessness or irritability. Disadvantages to using casein hydrolysate formulas include poor acceptance by some infants due to the taste and higher cost to the family.

Amino Acid-Based Elemental Formulas

For many infants with protein allergies, hydrolysate formulas work to relieve their allergy symptoms. However, some infants with protein allergies may have an allergic response to the shorter peptide components in hydrolysate formulas. These infants with severe allergies will do best on amino acid-based elemental formulas. The proteins in these formulas are broken down to elemental single amino acids so that they can be easily absorbed and digested.

Composition of Amino Acid-Based Elemental Formulas

The protein source is comprised of 100% single amino acids, the fat source contains approximately 33% medium chain triglycerides (MCT) to aid in absorption and are lactose free.

Indications for Use of Amino Acid-Based Elemental Formulas:

1. Allergies to cow's milk proteins and soy protein
2. Multiple food protein intolerance
3. Skin, respiratory and/or gastrointestinal symptoms caused by food protein allergy

4. Gastroesophageal reflux disease (GERD) caused by food protein allergy
5. **Short Bowel Syndrome**
6. Malabsorption
7. Other GI disorders, such as **Eosinophilic Esophagitis**

Post-Discharge Formulas for Preterm Infants

Infants who are born prematurely at 37 weeks or less gestation are at risk for nutritional deficiencies due to decreased body stores of nutrients at birth and increased demands for growth. Most of the infant's energy, protein, mineral and other nutrients reserves are stored during the last trimester. Prior to hospital discharge, premature/low birth weight infants may receive an in-hospital premature formula that is very high in certain nutrients, calories and protein. These formulas are designed to help the infant attain growth and bone mineralization close to what they would have, had they not been born early.



In Oregon, it is uncommon for an infant to be discharged on an in-hospital premature formula. Typically, the infant is changed to a post-discharge or transitional formula designed for premature infants. Post-discharge formulas have a calorie, protein and nutrient content about halfway between in-hospital premature formula and standard infant formula designed for full term infants.

Premature infants may have trouble digesting and absorbing nutrients. To help with this, post-discharge formulas have modified carbohydrates and fats that are more easily absorbed. Because of these modifications, it is important to note that while it may be appropriate in certain situations to concentrate standard infant

formula to a higher calorie level, it is not the same as a post-discharge formula for a preterm infant.

There are no definitive guidelines describing when to discontinue an infant from post-discharge formula. Birth weight, rate of weight gain, developmental status and medical conditions are considered when deciding the appropriate time to discontinue use. Your agency WIC nutritionist has access to additional resources such as the [Nutrition Practice Care Guidelines for Preterm Infants in the Community](#) and can answer your questions about formulas for premature infants.

Toddler/Follow-up Formulas

Parents and caregivers may ask about the use of toddler or follow-up formulas. These formulas are marketed by formula companies for infants who are at least 9 months of age and are eating solid foods. Toddler formulas are higher in calcium and protein than standard milk-based or soy-based formulas. These formulas are more expensive than standard formulas and are not nutritionally necessary for most infants and toddlers. It is developmentally normal for the infant to decrease the amount of formula they drink when they begin to eat solid foods.

Oregon WIC does not currently allow Toddler/follow-up formulas.



Activity

Use the Job aid: *Infant Formula Decision Process* and the Job aid: *Infant Medical Formulas for Qualifying Medical Conditions* to list one reason for the use and the names of the formulas Oregon WIC provides for each of the following types of formula:

1. Formula with added rice starch

2. Soy-based formula

3. Protein hydrolysate formula
4. Post-discharge formula for preterm infants
5. Amino Acid-Based elemental formulas

Talk with your local WIC Nutritionist about formulas that are on the market but Oregon WIC does not currently provide.

6. What type of formulas does this include?

Other Nutrients and Additives

As new things are learned about the composition and qualities of human milk, formula manufacturers strive to make these additions and changes to their products. Parents and caregivers may ask questions about some of these additives. The following are some additions that have been made to infant formulas.



DHA/ARA

DHA (Omega-3) and **ARA** (Omega-6) are fatty acids that occur naturally in breastmilk. These fatty acids have been found to be concentrated in the brain and eye. Studies have shown these fatty acids are important for achieving optimal mental and visual development. Preterm infants have decreased stores of DHA and ARA and are inefficient in producing their own DHA and ARA.

Probiotics and Prebiotics

A baby's intestines are colonized with bacteria soon after birth. Two main factors that determine the types of bacteria are the baby's diet and whether the baby is born by cesarean section or

vaginally. Studies have shown that the intestines of babies born vaginally and fed breastmilk contain greater quantities and varieties of beneficial bacteria than the intestines of babies born by cesarean section and/or who are formula-fed. A complex mix of prebiotics and probiotics are transferred to the infant through breastmilk. They act to promote the growth of beneficial bacteria early in life. Some formula manufacturers have begun adding prebiotics and probiotics to their formulas in order to try to mimic the effects of these naturally occurring prebiotics and probiotics. There are no current recommendations about the use of probiotics or prebiotics for infants.

Probiotics are live microorganisms, commonly known as “good” bacteria that help to keep the “bad” bacteria to a minimum in the gastrointestinal tract. They also boost immunity to fight disease by stimulating anti-inflammatory agents. Common types of probiotics you may read on formula labels include *Lactobacillus* and *Bifidobacterium*.

Prebiotics are carbohydrates which are resistant to digestion by stomach acid and enzymes. They pass intact to the lower gastrointestinal tract, and fuel the growth of naturally occurring beneficial bacteria. Beneficial bacteria serve many health-protective functions. They ferment carbohydrates in the colon to produce acids which make the gut environment more acidic, which inhibits the growth of potentially harmful bacteria. This is thought to be one of the reasons why breastfed infants experience fewer occurrences of diarrhea and other types of infections than do formula-fed infants. In addition, these helpful bacteria line the intestinal wall, acting as a barrier to help prevent disease-causing bacteria and potential allergens from entering the body. Other beneficial effects include better mineral absorption and the use of vitamins, such as vitamin K and folic acid. Common types of prebiotics you may see on formula labels include galacto-oligosaccharides (GOS) and fructo-oligosaccharide (FOS).



Fluoride

Fluoride is a mineral which is essential for tooth and bone formation. However, in excess quantities, it can cause a condition known as **fluorosis**. Some water systems have fluoride, others do not. Fluoride is present in only small amounts in infant formulas to prevent excess consumption of this mineral. Infants younger than 6 months do not need fluoride supplements regardless of whether they are breastfed or formula fed. After 6 months of age, fluoride supplementation is recommended for infants whose water does not contain adequate fluoride.

Vitamin D

Vitamin D is a fat soluble vitamin that is essential to maintain bone health and normal calcium metabolism. The recommended minimum daily intake of vitamin D is 400 IU/ day for infants beginning in the first few days of life. All formulas sold in the United States have at least 400 IU vitamin D per liter (33.8 ounces) of formula. Most formula-fed infants drink nearly one liter of formula per day after the first month of life and will achieve a vitamin D intake of 400 IU/day. Health care providers may suggest a supplement of vitamin D if the infant is drinking less than a liter of formula. Vitamin D supplements are also recommended for infants who receive a mixture of breastmilk and formula, since breastmilk contains insufficient quantities of vitamin D.



Activity

1. Ask your training supervisor about the fluoride level of the water systems serving your area.
2. Which of the added nutrients listed above are found in the standard bid milk-based formula WIC provides?

Lesson Level: 1

1-4 Other Milks

Objectives

After completing this lesson you will be able to:

- ◆ Identify two reasons why cow's milk should not be given to infants.

Overview

The WIC program does not provide cow's milk, goat's milk, soy based beverages or any other grain or nut based beverages for infants. This lesson will help you understand the reasons why WIC doesn't provide them and help you answer questions you may get from parents or caregivers.

Cow's Milk

Cow's milk, including whole, 2%, 1% and non-fat, is not recommended for infants during the first year of life due to a number of nutritional and medical problems that can result. Listed below are reasons why the AAP does not recommend babies be fed cow's milk during the first year of life.

- ◆ Cow's milk contains very little iron, vitamin E, vitamin C and other



nutrients as compared to breastmilk or infant formula. This may result in iron deficiency anemia and other nutritional deficiencies. Iron deficiency anemia may lead to long-term changes in learning and behavior that might not be reversible with iron supplements.

- ◆ Cow's milk can cause blood loss from the intestinal tract. Large curds can form in the stomachs of babies who drink cow's milk. As these curds pass through the intestines, they can cause scraping and bleeding, leading to blood loss in the stool. Over time, this can lead to iron-deficiency anemia.
- ◆ Since cow's milk is three to five times higher in protein, sodium, potassium and chloride as compared to breastmilk and infant formula, the kidneys of infants who consume cow's milk have difficulty processing these nutrients. This places a strain on immature kidneys and can lead to serious **dehydration**.
- ◆ Cow's milk contains proteins that are more likely to cause allergic reactions in infants.

Goat's Milk

Goat's milk is not a good substitute for breastmilk or infant formula.

- ◆ Goat's milk is deficient in a number of nutrients including iron, folate, vitamins C and D, thiamin, niacin, vitamin B6 and pantothenic acid. Some brands of goat's milk are fortified with vitamin D and folate, but others are not.
- ◆ Like cow's milk, goat's milk contains excess amounts of sodium, protein, potassium and chloride, which are not suitable for the infant's immature kidney to process.



- ◆ The fat in goat's milk is easier to digest than the fat in cow's milk, but the lack of some nutrients and excess of other nutrients makes it inappropriate for feeding to infants.
- ◆ Goat's milk is not a good substitute for infants who have an allergy to cow's milk-based infant formula. The protein in goat's milk is similar enough to cow's milk protein that infants who are allergic to cow's milk formula will likely be allergic to goat's milk as well.

Soy, Grain or Nut-Based Beverages (e.g., Soy Milk, Rice Milk, Almond Milk)

While beverages such as soy milk, rice milk, almond milk and other grain or nut-based milks are referred to as milk, they are not milk or formula and should not be fed to infants.

- ◆ These beverages are usually fortified with calcium, vitamins A and D, B12 and riboflavin, however, they are very low in calories, fat and protein compared to the infant's needs.
- ◆ Although the soy based beverages that are approved by WIC have more nutrients than others, they still don't have the combination of nutrients and calories that are needed by infants.
- ◆ Use of these beverages can be dangerous to an infant's health. Malnutrition has been reported in infants when these beverages are consumed as their only or major source of nutrition.





Activity

1. What are two reasons why infants should not be given cow's milk?
2. Why isn't goat's milk a good option for infants allergic to milk-based formula?
3. How might soy milk be different than soy-based formula?



Chapter 2

Contents

- 2-1 Gastrointestinal Issues
- 2-2 Food Allergies and Intolerance
- 2-3 Changing Formulas

Lesson Level: 1

2-1 Gastrointestinal Issues

Objectives

After completing this lesson, you will be able to:

- ◆ Describe three common causes of constipation in infants.
- ◆ Identify three common causes of diarrhea in healthy infants.
- ◆ Describe the difference between uncomplicated Gastroesophageal reflux (GER) and Gastroesophageal reflux disease (GERD)
- ◆ Describe two symptoms of colic in infants.

Materials Needed

- ◆ Participant Handout: *Common infant problems: crying*
- ◆ Participant Handout: *Common infant problems: colic*
- ◆ Participant Handout: *Common infant problems: constipation*
- ◆ Participant Handout 57-700: *Does my baby have constipation?*
- ◆ Participant Handout: *Common infant problems: diarrhea*
- ◆ Participant Handout: *Common infant problems: spitting up*
- ◆ Job Aid: Baby Behaviors: *What is Normal and When to Refer?*

Overview

When counseling families about feeding their infants, it is common to hear concerns about gastrointestinal issues including fussiness, gas, and changes in stooling patterns. WIC staff can help families understand normal baby behaviors and determine when further assessment may be necessary. This lesson will provide you with information on constipation, diarrhea, colic, gastroesophageal reflux and vomiting.

Constipation

Constipation is generally defined as a condition where bowel movements are hard, dry, and difficult to pass.

Although some believe that constipation is related to the frequency of the passage of stools, this may not be as important as the consistency of the stools. Part of the



difficulty in determining whether an infant is constipated is that each caregiver may have a different perception of how often an infant should have a bowel movement and whether an infant's stool is "too hard."

Constipation is not very common among breastfed infants. Formula-fed infants tend to have firmer stools, but this does not indicate constipation. Some caregivers believe iron causes their infant to be constipated, but studies have demonstrated no relationship between iron-fortified infant formula and constipation.

Constipation can be caused by a variety of factors such as:

Dietary influences

- ◆ Inadequate intake of breastmilk or infant formula
- ◆ Incorrect dilution of infant formula

- ◆ Early introduction of complementary foods (solids)
- ◆ Excessive cow's milk intake
- ◆ Excessive fluid loss due to vomiting or fever
- ◆ Lack of movement or activity

Underlying Medical Conditions

- ◆ Stool withholding due to rectal irritation from thermometers, vigorous wiping, diaper rash, etc.
- ◆ Abnormal function of the digestive tract
- ◆ Use of certain medications
- ◆ A variety of medical conditions and hormonal abnormalities
- ◆ Abnormal muscle tone

If a caregiver complains that an infant is constipated, assess the infant's diet with a focus on the dietary influences listed above and the following:

- ◆ The adequacy of breastmilk or infant formula intake
- ◆ Proper infant formula preparation and dilution if formula-fed
- ◆ Whether appropriate types and amounts of complementary foods are consumed
- ◆ Premature introduction of complementary foods if the infant is less than 4 months old

Note:

More information about constipation and guidance on when to refer the infant to an HCP for medical evaluation is found on the Job Aid: *Baby Behaviors: What is Normal and When to Refer?*



Activity

Using the Job Aid: *Baby Behaviors: What is Normal and When to Refer?* and the Participant Handout *Common Infant Problems: Constipation*, complete the case study below:

Janie is 18 years old and a mother for the first time. She is certifying her 1 month old infant today at the WIC Clinic. Janie states that one of her concerns is that her baby is constipated. She is currently on the standard milk-based bid formula. Janie is not breastfeeding at this time. Janie asks if changing formulas will help her baby's constipation.

1. What additional information would you need to know?

Janie states her infant has a bowel movement every 2 to 3 days. He seems to struggle but the stools are fairly soft.

2. What recommendations could you offer to Janie in this situation?
3. What recommendations would you offer if Janie had reported that her infant was having very hard dry stools every 4 to 5 days?

Diarrhea

Diarrhea is defined as the frequent passage of loose, watery stools. Diarrhea should not be confused with normal stools of breastfed infants. Diarrhea in infants can be caused by:



- ◆ Consuming contaminated food or water (possibly from improper infant formula preparation or storage techniques)
- ◆ A reaction to food
- ◆ Excessive juice consumption
- ◆ Use of certain medications
- ◆ Medical conditions or infections
- ◆ Malabsorption of food

Diarrhea, if left untreated in an infant, can rapidly lead to dehydration which can be life-threatening and is the most common cause of hospitalizations in otherwise healthy infants. Chronic diarrhea may lead to nutrient deficiencies because food that passes through the gastrointestinal tract too quickly cannot be digested and then the nutrients cannot be absorbed.

Note:

Use the Job Aid: *Baby Behaviors: What is Normal and When to Refer?* for more information about diarrhea and guidance on when to refer the infant to an HCP for medical evaluation.

Use of ordinary beverages to treat diarrhea may actually worsen the condition and lead to further dehydration. In most cases of acute diarrhea, when dehydration is not present, continued feeding of the infant's usual diet is the most appropriate treatment. Caregivers should talk with the infant's HCP about the recommended treatment of diarrhea and should not self-treat.

The following are recommendations during acute diarrhea without dehydration:

- ◆ For breastfed infants, continue to breastfeed on demand.
- ◆ For formula-fed infants, continue offering usual amounts of infant formula.
- ◆ Reduced-lactose or lactose-free infant formula is usually not necessary.

- ◆ Do not dilute infant formula with additional water as this alters the caloric and nutrient content.
- ◆ For infants eating complementary foods, and children continue to receive their usual diet during diarrhea, emphasizing complex carbohydrates (such as rice, wheat, and potatoes) and meats (especially chicken).
- ◆ Reinforce the message that infants should not be fed ordinary beverages such as carbonated beverages, sport drinks, fruit juice, tea, or chicken broth.
- ◆ Avoid withholding food for more than 24 hours. Do not use the “BRATT” diet (bananas, rice, applesauce, tea and toast). It is no longer recommended due to the restriction of calories and nutrients.

Depending on the infant’s condition, an HCP may prescribe an appropriate **oral rehydration solution (ORS)** to prevent and treat dehydration resulting from diarrhea. ORS should be used only under the supervision of a health care provider. The AAP Practice Guidelines recommend that infants with diarrhea who are dehydrated should receive ORS therapy until their dehydration is resolved, and then they should be fed their age-appropriate diets, including breastmilk or full-strength milk-based formulas. Parents should be aware that the ORS replaces fluid and electrolyte losses but does not stop diarrhea and the diarrhea is likely to continue for three to seven days.



Activity

Using the Job Aid: *Baby Behaviors: What is Normal and When to Refer?* and the Participant Handout *Common Infant Problems: Diarrhea*, complete the case study below:

Donna reports that she is mixing her 7 month old baby's formula at half strength due to the baby having diarrhea. She previously has been tolerating the milk-based bid formula and consuming baby foods. She has been having diarrhea since yesterday. Donna's mother told her to give the baby more juice and less formula until the diarrhea went away. Donna asks if she should switch her baby's formula today since she is in the clinic to pick up benefits.

1. What recommendations would you make to Donna regarding her infant's diarrhea?

Colic

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. The cause of colic is unknown.

Persistent crying is sometimes mistakenly thought of as colic. Parents are often convinced that persistent crying is related to feeding and they might give up breastfeeding or switch to a different formula to address the problem. For more information on persistent crying, see the *Baby Behaviors Online Course*.

Colic is very common, affecting one in four newborns. The reason for the irritability is not totally clear but includes:

- ◆ An immaturity of the baby's nervous system
- ◆ Sleeping disruption
- ◆ Hypersensitivity to the environment
- ◆ Sensory overload
- ◆ Formula-fed infants seem to experience colic more often than breastfed infants

- ◆ Colic has been associated with infants fed fruit juices containing sorbitol, such as apple, white grape, and pear juice.

Only a small fraction of babies who have colic will actually be suffering from an identifiable medical conditions such as gastroesophageal reflux (GER) or food allergies.

Recommendations for managing colic indicate that in most cases, what is needed is a lot of patience. Other recommendations include the following:



- ◆ Parents and other family members can take turns with the baby's care. Infant massage, soothing music, and swaddling can help the days pass for a colicky baby.
- ◆ Breastfed infants may benefit from breastfeeding mothers eliminating dairy products and/or gas forming foods from their diet.
- ◆ Breastmilk oversupply and/or overactive let-down is often misdiagnosed as colic in breastfed infants.
- ◆ If acid reflux is suspected, the HCP may prescribe medication.
- ◆ If colic persists in conjunction with food allergies, the baby's formula may be changed to one that is hypoallergenic.

Colic usually resolves by the time the infant is 3 months old. Colicky infants typically continue to gain weight and grow normally.

Note:

Use the Job Aid: *Baby Behaviors: What is Normal and When to Refer?* for more information about colic and guidance on when to refer the infant to an HCP for medical evaluation. If symptoms worsen, such as a change in baby's behavior or body language or sudden vomiting, refer to a health-care provider.



Activity

Using the Job Aid: *Baby Behaviors: What is Normal and When to Refer?* and the Participant Handout *Common Infant Problems: Colic*, complete the case study below:

Rhonda, a new mom of a 2-week old son, is in the clinic to add him to the WIC program. She looks exhausted and informs you that the baby has had severe colic. He has been crying nonstop. She is giving him formula and breastmilk.

1. What additional information would you need to obtain?
2. What advice could you offer to Rhonda regarding her infant's colic?

Gastroesophageal Reflux

Gastroesophageal reflux (GER) is a condition in which stomach contents flows backwards into the esophagus. It is normal for babies and young children to occasionally spit-up small amounts of breastmilk or formula following a feeding, especially when being burped or when having a diaper changed. This happens because the ring of muscles that separates the top of the stomach from the esophagus is not fully developed or not working properly. In most cases, GER resolves without intervention by the age of 8 to 18 months when the infant sits upright more or walks and eats more solid foods. GER, although usually a benign condition, can range from mild spitting-up to a more severe form that may cause stomach contents to get inhaled into the lungs (**aspiration**), failure to thrive, lung disease, or inflammation of the esophagus.

Spitting-up is the mildest form of GER. Growth and health is not affected, and symptoms improve with time. Spitting up can be a result of:

- ◆ Immaturity of the ring of muscles that separates the top of the stomach from the esophagus.
- ◆ Overfeeding: Many young infants cannot consume large volumes of milk or food at one time. If the infant's weight-for-length is at or above the 95th percentile, it may indicate overfeeding.
- ◆ Swallowing air before or during feeding: Start feeding before the infant becomes frantic and is crying; position the bottle so that the nipple is filled with milk; burp the baby frequently.
- ◆ Excessive stimulation: create a calm, relaxed feeding environment.

In the infant who has been diagnosed with uncomplicated GER or the “happy spitter,” parental education and reassurance are helpful and generally no other intervention is needed.

Gastroesophageal-reflux disease (GERD) is a serious problem that can lead to serious health consequences. GERD in infants is GER that is complicated by one or more of the following:



- ◆ Weight loss, if pain or discomfort from acid reflux causes refusal to eat or when too much of what is eaten is lost.
- ◆ Inflammation or erosion of tissue in the esophagus from chronic exposure to stomach acid — if erosion is severe, blood loss resulting in anemia may occur. Inflammation can also lead to scarring and narrowing of the esophagus.
- ◆ Aspiration of stomach contents into the airways of the lungs — repeated aspiration can lead to chronic lung disease or pneumonia, which can result in permanent damage to the lungs.

Very few otherwise healthy infants have GERD. GERD may happen in the following situations:

- ◆ Infants or children with neurological or developmental disabilities are especially prone to GERD and their condition tends to be more severe and persistent. Low muscle tone is common with conditions such as Down syndrome. Slouching can put more pressure on the stomach and forces food back up into the esophagus. Children with low muscle tone also tend to get constipated more frequently, which can make reflux worse by “backing up” the system.
- ◆ GERD can occasionally be caused by stress resulting from problems in the relationship between the infant and caregiver or any other type of environmental stress. Emotional stress affects movement in the gastrointestinal tract.

Signs of GERD may include one or more of the following symptoms:

- ◆ Vomiting/spitting up
- ◆ Irritability and/or crying
- ◆ Refusal or aversion to feeding
- ◆ Weight loss
- ◆ Wheezing/coughing/asthma
- ◆ Swallowing frequently
- ◆ Drooling
- ◆ Night time awakening with unexplained irritability
- ◆ Arching backwards (especially during and after a feeding)
- ◆ Pneumonia
- ◆ Apnea (episodes of not being able to breathe)

Treatment of GERD must be prescribed by a health care provider and usually consists of:

- ◆ Smaller and more frequent feedings — if smaller feedings do not help, the health care provider may prescribe a concentrated formula to give the infant adequate nutrients with a smaller amount of formula. Tube feedings may be required in extreme cases.
- ◆ Positioning at night— this recommendation should be made by the baby’s health care provider and not by WIC staff. Laying the infant on their stomach, with the head of the bed elevated has been shown to reduce reflux symptoms and is sometimes recommended by health care providers. However, since the AAP recommends that all healthy infants sleep on their back to prevent Sudden Infant Death Syndrome (SIDS), recommendations have been modified. Laying the baby on their stomach is acceptable while the baby is awake, particularly after feeding.
- ◆ Changing formula — unless vomiting is due to an allergy, changing formula is usually not effective in reducing symptoms of GERD. When a cow’s milk protein allergy is present, the incidence of vomiting can be reduced by changing to a hypoallergenic formula.
- ◆ Thickening formula — adding cereal to formula is a traditional treatment which is controversial because it may reduce the number of episodes of vomiting but not reflux symptoms. Cereal added to formula is not recommended as it can add unwanted calories, leading to obesity, and it can dilute the other nutrients in formula.
- ◆ Rice starch added formula — as you’ve learned in a previous chapter, these formulas thicken in the presence of stomach acid. Effectiveness may be reduced if acid reducing medications are prescribed.



- ◆ Medication — medications may be given to increase the rate of stomach emptying or to decrease or neutralize stomach acid.
- ◆ Surgery — an infant with neurological problems is less likely to respond to medicine and positioning, and more likely to require surgery.
- ◆ Psychological counseling may be needed to resolve the problems between the infant and caregiver if stress is contributing to “nervous vomiting.”

Vomiting

Vomiting is the forceful expulsion of the stomach contents, unlike the passive movement of GER. Vomiting can be related to:

- ◆ Illness — may be accompanied by other symptoms such as fever, diarrhea, dehydration, and electrolyte imbalance.
- ◆ Allergy or intolerance — usually accompanied by diarrhea, rash, or respiratory symptoms such as wheezing or congestion.
- ◆ Inborn errors of metabolism — usually accompanied by failure to thrive, neurologic symptoms, seizures, or developmental delay.
- ◆ Structural problems in the gastrointestinal tract, such as the narrowing of the opening from the stomach into the small intestine called **pyloric stenosis**.



Note:

Use the Job Aid: *Baby Behaviors: What is Normal and When to Refer?* for more information about GER, GERD, and vomiting and guidance on when to refer the infant to an HCP for medical evaluation.



Activity

Using the Job Aid: *Baby Behaviors: What is Normal and When to Refer?* and the Participant Handout *Common Infant Problems: Spitting Up*, complete the case studies below:

You are conducting a class today on Infant Nutrition. Amanda has a 2-month-old baby and she states that she is worried that the baby spits up a lot. Amanda says she runs out of formula from WIC every month and that her baby drinks about 40 ounces of formula every day. Amanda is bouncing the baby on her knee during the class after feeding her a bottle. The baby spits up and Amanda says “See, this is what she does all the time!”

1. What advice could you offer Amanda regarding her baby’s spitting up?

Tonia is in class today as well and comments that she is also having trouble with her 4-month-old baby spitting up. She says she has tried four different formulas and the baby continues to spit up. She has tried two milk-based formulas and a lactose-free formula but the baby is vomiting all of these. Her friend had the same problem with her baby and adding cereal to the formula helped. Tonia wants to know if she can get cereal today with her WIC benefits.

2. What advice could you offer Tonia regarding her baby’s vomiting?

Lesson Level: 1

2-2 Food Allergies and Intolerance

Objectives

After completing this lesson, you will be able to:

- ◆ Define the difference between food allergy and food intolerance.
- ◆ Identify differences between lactose intolerance and cow's milk protein allergy.

Materials Needed

- ◆ Participant Handout: *Common infant problems: food allergies*
- ◆ Job Aid: *Baby Behaviors: What is Normal and When to Refer?*

Overview

An adverse food reaction is any negative physical reaction caused by eating a food. Adverse food reactions can be divided into two main groups: food allergy and food intolerance. A food allergy is an inappropriate response of the immune system that is triggered when a food is eaten by a person and that results in symptoms throughout the body involving several systems (e.g. gastrointestinal tract, respiratory tract, nervous system, skin and mucous membranes). Another term for an allergic reaction is a hypersensitivity reaction (a term used interchangeably with allergy). Food intolerance is an adverse reaction to food that results in physical symptoms but is not caused by an immune system reaction.

Food Allergy

A food allergy is the body's call to action in response to an attack on the immune system by a food. When the body recognizes that a specific substance is a threat, it produces **antibodies** in response to the threat.



Most food-allergy reactions happen within a few minutes to two hours after the food is eaten. Other reactions may be delayed up to 48 hours after eating the allergy-causing food. Symptoms vary tremendously between people. Differences can include the type of symptom(s) that will appear, where they appear, how severe they are, the amount of time from when the food is eaten to when the symptoms are seen, and the amount of food that triggers the reaction.

Symptoms may include:

- ◆ Abdominal pain
- ◆ Vomiting
- ◆ Hives
- ◆ Eczema
- ◆ Sneezing
- ◆ Chronic coughing without an infection
- ◆ Anaphylaxis
- ◆ Diarrhea
- ◆ Nausea
- ◆ Swelling of lips, tongue, throat, or face
- ◆ Rashes
- ◆ Asthma
- ◆ Congestion
- ◆ Failure to thrive
- ◆ Bloating
- ◆ Gas
- ◆ Itchiness

Food allergies affect about 6 percent of children who are under the age of 3. Eight foods cause 90 percent of all allergic reactions, these include: milk, eggs, peanuts, fish, shellfish, soy, wheat, and tree nuts (such as walnuts, pecans, almonds, and cashews). A child will usually outgrow allergic reactions to the protein in eggs or cow's milk by age 5.

Anaphylactic reaction is the most severe allergic response. It occurs when the whole body becomes overwhelmed with the response to an **allergen**. Even though rare, it is the most severe and dangerous symptom of an allergy, and can result in death if not treated immediately. Symptoms of anaphylactic reaction include:

- ◆ Difficulty in breathing
- ◆ Dizziness
- ◆ Swelling of lips, tongue, throat, face, and skin
- ◆ Irregular heartbeat
- ◆ Changes in blood pressure
- ◆ Shock

The foods that are most likely to cause an anaphylactic reaction include peanuts, shellfish, eggs, and tree nuts. Children with this severe of allergic reactions will always need to have appropriate medicine available to immediately treat these symptoms.

Cow's milk allergy

Cow's milk is one of the most common allergenic foods in infancy and often gets confused with lactose intolerance. Milk allergy is caused by an immune reaction to the proteins in milk, whereas lactose intolerance is caused by the body's inability to produce sufficient quantities of the digestive enzyme, lactase.

If an infant is allergic to the proteins in milk-based infant formulas, they are most likely going to present with allergic response within the first year of life. Symptoms most commonly present in the skin and in the gastrointestinal tract. Some infants may present with breathing difficulties or asthma-like symptoms. Blood in the stool can be associated with cow's milk allergy and it may be difficult to see but can cause iron-deficiency anemia.

If the milk-allergic infant cannot be breastfed, extensively hydrolyzed formulas are the best alternative. A small number of infants may still react to the protein in these formulas and may need an amino acid based, elemental formula in which the proteins are broken down in to single amino acids. Many children can outgrow their cow's milk allergy by their fifth birthday.

Food Intolerance

Food intolerance differs from a food allergy (hypersensitivity) in that it is an abnormal reaction to an ingested food not caused by an immune response. There are three types of food intolerance:

- ◆ Pharmacologic reaction — the body's response to a natural or added chemical that produces an effect resembling that of a drug. One example of a natural chemical is caffeine in tea or coffee.
- ◆ Food toxicity — reaction caused by toxins contained in the food or released by microorganisms that contaminate the food. Mercury and pesticides are chemicals that are toxic to everyone and are considered examples of chemical contamination.
- ◆ Metabolic reactions — the body's inability to metabolize certain components of food. Lactose intolerance is a metabolic reaction that is the most common food intolerance.

Lactose Intolerance

Lactose is the sugar in the milk of most mammals and in breastmilk. Lactose enhances the absorption of a number of minerals including calcium, magnesium, and zinc.

Lactase is the enzyme that is naturally present in breastmilk and also found in the small intestine. The purpose of intestinal lactase is to break down lactose so that it can be absorbed. Full-term infants are able to digest lactose. Lactase activity can be very low in premature infants, since lactase does not reach a peak until 34 to 38 weeks gestation.

Lactose intolerance is when there is not enough lactase present to help break down the lactose that has been consumed. There are three kinds of lactose intolerance:

- ◆ Congenital lactase deficiency — an extremely rare genetic condition that exists when lactase is very low or absent at birth.



- ◆ Secondary lactase deficiency — temporarily low amounts of lactase as a result of:
 - Intestinal infection or virus,
 - Certain antibiotics, or
 - Physical conditions that affects the cells lining the intestine.
- ◆ Adult (or late-onset) lactase deficiency — a genetic condition that does not occur in infants, is more common in adults and older children, especially from certain ethnic groups. Approximately 10 to 20% percent of white adults, up to 50% of North American Hispanic adults, about 80% percent of African-American adults, and 80 to 100% of Asian adults are lactase deficient.

Lactose intolerance is very rare before the age of 2 to 3 years. Since lactase is present in breastmilk, it is extremely rare for a breastfed infant to have lactose intolerance. Cow's milk protein allergy is often mistaken for lactose intolerance in breastfed babies.

For a person with lactose intolerance, even very small amounts of lactose can cause severe watery diarrhea because undigested lactose actually acts as a laxative.

You may hear from families that their baby is experiencing diarrhea as a result of a gastrointestinal illness (e.g. rotovirus), or a course of antibiotics. This is most likely a temporary situation called secondary lactase deficiency and not a cow's milk allergy. Diarrhea associated with secondary lactase deficiency is caused by injury, damage to the intestinal lining where lactase is made. When intestinal injury happens, the first enzyme to be affected and the last to recover completely is lactase. Recommendations for infants recovering from an acute episode of diarrhea include:

- ◆ After initial rehydration, most infants can be continued on breastmilk or standard infant formula. A lactose restricted diet is not required.



- ◆ If diarrhea persists, then a lactose-free formula such as a soy-based formula or a protein hydrolysate formula can be used until the diarrhea resolves.
- ◆ Infants who are on a mixed diet of solid foods with formula or with breastmilk sometimes have diarrhea of shorter duration, because they are exposed to less lactose than babies who are consuming only breastmilk or standard, milk-based infant formula.

Note:

For more information on the use of protein hydrolysate formulas see Chapter 1, Lesson 3 *Types of Formula*. For more information on diarrhea see Chapter 2, Lesson 1 *Gastrointestinal Issues*.

Differences between Lactose Intolerance and Cow's Milk Allergy

	Lactose Intolerance	Cow's Milk Allergy
Cause	Reaction after intake of too much lactose in relation to the body's ability to break it down by the enzyme lactase	Immune response to one or more cow's-milk proteins; immaturity of infant's digestive and immune processes likely contributes to this condition
When does it start?	After intestinal lining is injured by severe infection, medication, or disease.	Infancy and early childhood, very rare, especially in adults
How common is it?	Uncommon before 2 to 3 years of age; considered over-diagnosed	Rare: 0.3-7.5 percent of children

	Lactose Intolerance	Cow's Milk Allergy
Possible symptoms	Gas, abdominal bloating, pain (cramps), diarrhea	Variable and broad; gastrointestinal, skin, respiratory, systemic (see list of symptoms of food allergies on page 68)
Outlook	Temporary depending on the extent of the intestinal damage and whether the infant was dehydrated	Usually outgrown by age 5
Management	<p>Formula-Fed Infants: Usually can be continued on milk-based formula; may need a lactose-free formula temporarily until symptoms resolve</p> <p>Children: Limited amounts of milk and milk products can be included in the diet. Drink small amounts of milk; drink milk with food or meals; eat yogurt with active cultures and most cheeses; try lactose-reduced milk and lactase enzyme preparations</p>	Strict avoidance of cow's milk and cow's milk protein may be needed



Activity

Using the Job Aid: *Baby Behaviors: What is Normal and When to Refer?* and the Participant Handout *Common Infant Problems: Food Allergies*, complete the case study below:

Linda states her 2-month-old baby has a rash and occasional diarrhea on the current milk-based bid formula. Her older child had the same problems with milk-based formula as an infant.

1. Do you think Linda's baby is showing symptoms of a cow's milk allergy or lactose intolerance?

2. What are three symptoms of food allergies?

Lesson Level: 1

2-3 Changing Formulas

Objectives

After completing this lesson, you will be able to:

- ◆ Instruct a parent or caregiver on how to transition from one formula to another.

Materials Needed

- ◆ Participant Handout: *Changing Your Baby to a New Formula*

Overview

After reading this module, you know that infants change to different formulas for all kinds of reasons. We hope that the change to a new formula helps the infant, but sometimes changing formulas can be difficult for either the infant or the caregiver. This lesson will offer some ideas for making the transition easier.

A Transition Plan

One common situation is an infant that has started on a formula WIC doesn't provide before they come for their first WIC appointment. This may be because the health care provider recommended it or something as simple as the parent got a coupon in the mail. If a full-term infant enters the WIC program using a non-bid formula, counsel the parent or caretaker on how to transition the infant to a bid formula.

- ◆ Start by taking a formula history and decide whether the bid cow's milk-based formula is appropriate.
- ◆ Provide instructions on blending new and old formulas to ease the infant through the transition. See the Participant Handout: *Changing Your Baby to a New Formula*.
- ◆ Inform the parent or caretaker of the possible results of switching formulas. For example, there may be a change in feeding frequency or stool type.

Most babies will drink any formula. Each one tastes a little different. Some babies notice this difference and it will help to begin using the new formula slowly. Here is one method you can suggest for changing an infant to a new formula:



- ◆ Start by adding a small amount of the new formula to the formula your baby is currently using.
- ◆ Each day add more of the new formula so the infant slowly gets used to the different taste.
- ◆ After a week the infant should be used to the new formula.

Trying Out a New Formula

If the parents or caregivers are trying a new formula in order to solve one of the issues you learned about earlier in this module, you can use the same transition process.

- ◆ You may want to only issue one month of vouchers for the new formula to make sure it works.
- ◆ Refer to the *Food Package Module* for more information on assigning and issuing trial formulas.

Trial Back

Infants who needed a change in formula due to an illness such as a gastrointestinal illness, may be able to return to the standard infant bid formulas WIC offers once the illness is resolved. The Participant Handout, *Changing Your Baby to a New Formula* can be used to assist with this transition.

If the infant's initial intolerance problem was due to an allergy-related issue, a trial back would not be appropriate. Refer to your WIC Nutritionist/Dietitian for further assessment and evaluation.

Clinic roles for changing of formulas back to bid formulas

Issue for the infant	Type of formula	Role of paraprofessional CPA's	Role of RD or RN
Diagnosed with GER but has since outgrown by 8 months and HCP has approved return to bid formula	Formula with added rice starch for GER (e.g. Similac for Spit Up)	Provide counseling and instructions for returning to bid formula	
Recovering from gastroenteritis and able to tolerate a milk-based formula again	Hydrolyzed protein formula (e.g. Alimentum)	Provide counseling and instructions for returning to bid formula	
Caregivers providing a reduced lactose formula but can no longer afford to pay for the formula and wants to try a milk-based formula	Reduced lactose formula (e.g. Gerber Good Start)	Provide counseling and instructions for returning to bid formula	Refer to RD/RN if complications arise

Issue for the infant	Type of formula	Role of paraprofessional CPA's	Role of RD or RN
Has been receiving a hydrolyzed protein formula due to symptoms of hives and diarrhea; Caregivers want to re-trial a milk-based formula as the other formula is expensive	Hydrolyzed protein formula (e.g. Nutramigen)	Refer to RD/RN	Assess status and discuss care plan with HCP; possible referral to community resources for assistance with formula



Activity

1. List the basic steps in a transition plan to change to a new formula.
2. Using the table above, talk with your WIC Nutritionist or Training Supervisor about possible actions for the following situation:

A family comes in requesting a change in formula for a 7 month old infant that had been experiencing gastroesophageal reflux and the caregiver reports that the infant is sitting up more and that the spitting up has improved greatly.

3. What is your role as a CPA in this situation?



Job Aids

Contents

Job Aids:

Infant Formula Decision Process

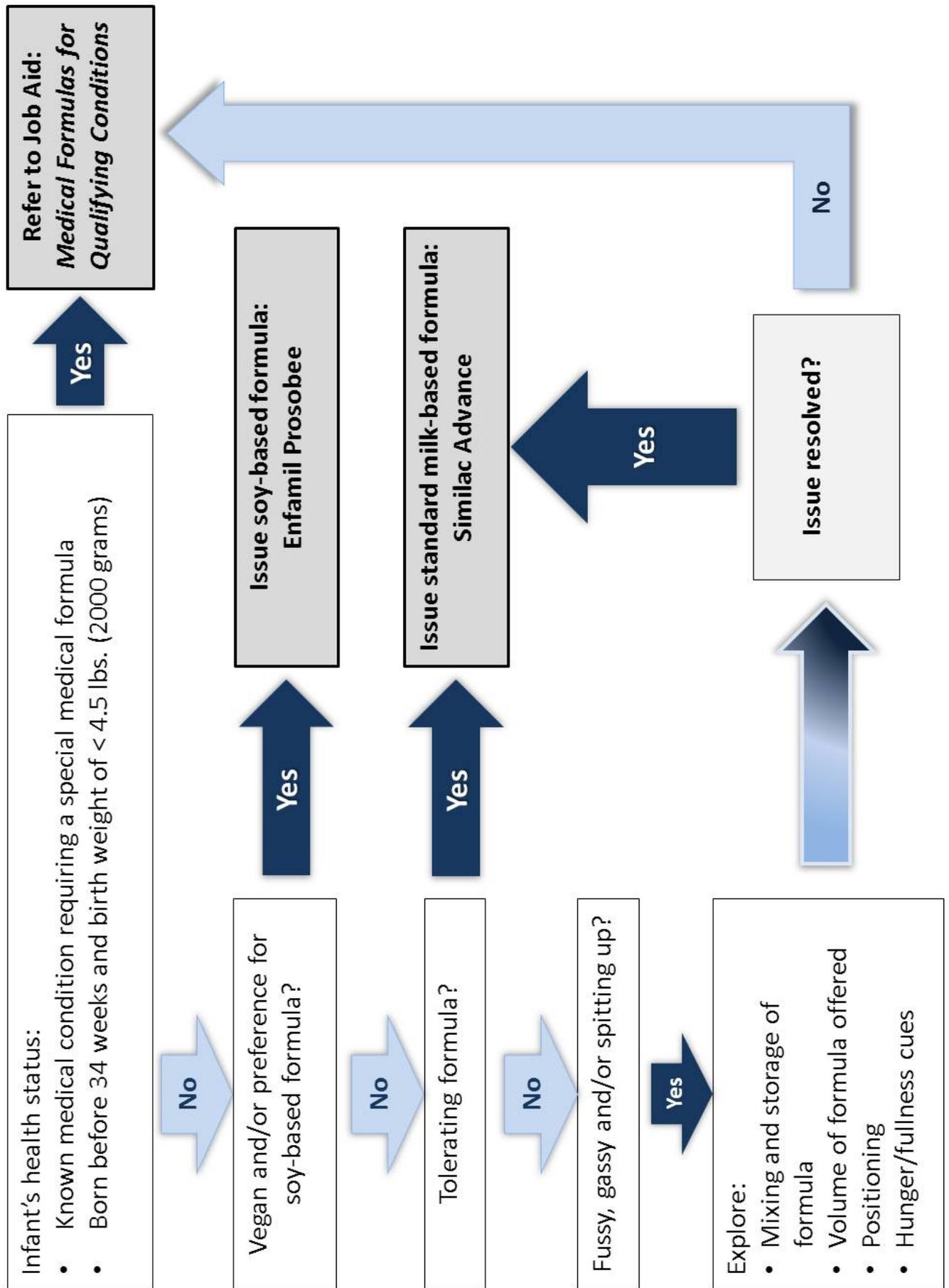
*Infant Medical formulas for Qualifying Medical
Conditions*

*Baby Behaviors: What is Normal and When to
Refer*

Consider the following when using the Decision Process Diagram/Flowchart on the next page:

- ◆ Breastfeeding is encouraged for all infants. For women who choose not to, or are unable to breastfeed, infant formula is available. Formulas listed are subject to change.
- ◆ Majority of infants do well on any formula, including our rebated milk-based formula, Similac Advance. Other than our rebated formulas, Similac Advance and Enfamil Prosobee, formulas listed require the Oregon Medical Documentation form to be completed by the infant's health care provider.
- ◆ Issues of diarrhea and constipation are not included on the Decision Process diagram. Refer to *Lesson 2-1 ■ Gastrointestinal Issues*, page 53, in this module for more information on these topics.
- ◆ If an infant comes into WIC on a soy-based formula, is tolerating it well and it is the family preference to stay with a soy-based formula, that is a personal preference that WIC can provide.
- ◆ This decision tree helps support the Oregon Medical Documentation form and is intended to help WIC staff understand the connection between qualifying conditions and requests for special medical formulas.
- ◆ If you have questions regarding a formula, consult your local agency WIC Nutritionist/Dietitian or State Nutrition Consultant.
- ◆ WIC does not provide formula for infants while they are hospitalized.
- ◆ When possible, consider short term issuance of a special medical formula and work with the health care provider and your local agency WIC Nutritionist/Dietitian to determine appropriateness of transitioning back to our rebated milk-based formula.

Infant Formula Decision Process



Infant Medical Formulas for Qualifying Medical Conditions

This is a listing of all of the infant medical formulas Oregon WIC offers. Consult your WIC Nutritionist if you have questions regarding a specific formula or requests for medical formulas.

Qualifying medical condition(s):	Medical formulas Oregon WIC provides:
Premature infant <34 weeks and birthweight <4.5lb (2000 grams)	Premature Post-Discharge/Transitional Formula: Similac Neosure Enfamil Enfacare
Gastroesophageal Reflux Disease (GERD)	Added Rice Starch Formula: Similac Spit-Up Enfamil AR
<ul style="list-style-type: none"> ◆ Cow's milk/soy protein allergy ◆ Malabsorption ◆ Short bowel syndrome ◆ Cystic fibrosis ◆ GERD 	Extensively Hydrolyzed Protein formula: Alimentum, Nutramigen Pregestimil
Following conditions not responding to extensively hydrolyzed protein formula: <ul style="list-style-type: none"> ◆ Cow's milk/soy protein allergy ◆ Multiple food protein intolerance ◆ GERD ◆ Short bowel syndrome ◆ Malabsorption ◆ Esosinophilic esophagitis 	Free Amino Acid-Based, Elemental Formula: Elecare Neocate Infant PurAmino
Chylothorax or Long chain-3-hydroxyacyl-CoA dehydrogenase (LCHAD) deficiency	Milk-Based, High MCT Oil Formula: Enfamil Enfaport (intended for short term use)
Condition requiring a lower mineral intake due to impaired renal function, or other impaired organ function	Low Mineral Formula: Similac PM 60/40
Inborn errors of metabolism/metabolic condition	Contact the State WIC office
Other medical condition not listed here	Contact the State WIC office

What's the issue?	What to explore further?	What is common/ What is normal?	What formula, information to offer?	When to refer to the health care provider?
<p>Spitting Up</p>	<ul style="list-style-type: none"> ● Volume: How much is offered at each feeding? ● Mixing of formula: Are too many air bubbles going in? ● Positioning: <ul style="list-style-type: none"> ▪ Is the baby being jostled during feeding? ▪ Is the baby laid down right after a feeding? ▪ Is bottle tipped so baby is gulping air? ● Nipple: Is the nipple opening too large, resulting in a large amount of volume going in? ● Illness: Is the infant coming down with a cold or respiratory illness? ● Teething: Is the infant drooling more? 	<ul style="list-style-type: none"> ● Half of all three-month-old babies spit up at least once a day ● Spitting up usually peaks by 2-4 months of age ● Most infants outgrow spitting up by the time they are sitting up or by 12 months of age ● Overfeeding is a common reason ● Growth is usually normal and the spitting up is more of a nuisance than a concern ● When teething, babies tend to drool more and can swallow extra saliva resulting in spitting up 	<p>Formula: Similac Advance powder or concentrate</p> <ul style="list-style-type: none"> ● Match infant's stomach size with the volume of formula being offered (ex. by 6 weeks the size of an infant's stomach is approximately the size of a large egg and does best with 3-5 oz of formula at a feeding) ● Offer smaller, more frequent feedings ● Feed in arms, avoid car seats ● Stop often to burp ● Keep infant upright after a feeding ● If proper mixing is concern, offer concentrate to help reduce air bubbles <p>Handouts to offer: *</p> <ul style="list-style-type: none"> ● Help me be healthy ● Common infant problems: Spitting Up 	<p>Refer to the health care provider if spitting up does not resolve and infant shows signs of:</p> <ul style="list-style-type: none"> ▪ coughing ▪ gagging ▪ arching backwards ▪ having trouble breathing ▪ growth faltering ▪ projectile vomiting (vomiting where formula is ejected forcefully, sometimes over a distance of several feet) more than 1x/day

What's the issue?	What to explore further?	What is common/ What is normal?	What formula, information to offer?	When to refer to the health care provider?
<p>Vomiting, vs. GER, vs. GERD</p>	<ul style="list-style-type: none"> • Explore signs and symptoms of spitting up to identify what is normal spitting up, also known as Gastro Esophageal Reflux (GER) versus underlying medical condition called Gastro Esophageal Reflux Disease (GERD) 	<ul style="list-style-type: none"> • Sometimes it can take 6-8 weeks for the muscles at the upper and lower end of the stomach to get into rhythm. Until that time, formula can sit in the infant's stomach longer than normal and the stomach may push it back up • Gastro Esophageal Reflux Disease (GERD) is a more serious, chronic, long lasting form of GER • Infants with low muscle tone, poor muscle control are more prone to GERD 	<p>Formula: Similac Advance or, with medical documentation: Similac Spit Up or Enfamil AR</p> <ul style="list-style-type: none"> • Follow guidelines for spitting up including positioning, small/frequent feedings • Adding solids to a bottle is never recommended <p>Note: Refer to your WIC Nutritionist for further assessment</p>	<p>Refer to the health care provider if the infant is showing ongoing signs of reflux and:</p> <ul style="list-style-type: none"> ▪ vomiting ▪ coughing, gagging ▪ difficulty with swallowing ▪ pneumonia or trouble breathing, wheezing ▪ arching backwards when feeding ▪ refusing to feed ▪ poor weight gain ▪ Or if the caregiver is considering asking the infant's health care provider for medication to treat GERD

What's the issue?	What to explore further?	What is common/ What is normal?	What formula, information to offer?	When to refer to the health care provider?
<p>Crying, Fussy</p>	<ul style="list-style-type: none"> ● Infant cues: <ul style="list-style-type: none"> ▪ In need of a diaper change? ▪ Overwhelmed, in need of a break? ▪ Too hot, too cold? ▪ Hungry or not? ▪ Sleepy? ● Teething: Is there discomfort from a tooth coming in? ● Mixing of formula: Are too many air bubbles going in? ● Illness: Is the infant coming down with a cold, respiratory illness or ear infection? 	<ul style="list-style-type: none"> ● Learning infant's communication takes time ● Crying is the main communication tool for an infant ● Normal infant fussiness starts at about 1-3 weeks of age ● Fussiness typically peaks at 6-8 weeks and is gone by 3-4 months of age ● Commonly happens in the evening hours or right after feeding ● May be a sign of needing to burp, pass gas or poop 	<p>Formula: Similac Advance</p> <ul style="list-style-type: none"> ● Promote skin-to-skin contact ● Speak softly, play calming music or sing ● Repetition: doing a soothing action over and over (gentle rocking, swaying, etc.) ● Wrapping baby snugly in a blanket ● Gentle massage, strokes ● Acknowledge caregiver's feelings <p>Handouts to offer:</p> <ul style="list-style-type: none"> ● Bringing Home Baby (Meredith) ● Understanding Your Baby's Cues ● Why Do Babies Cry? ● Healthy Sleep: For You and Your Baby 	<p>Refer to the health care provider if fussiness does not resolve and infant shows signs of:</p> <ul style="list-style-type: none"> ▪ refusing breast/bottle ▪ unable to calm ▪ showing signs of illness

What's the issue?	What to explore further?	What is common/ What is normal?	What formula, information to offer?	When to refer to the health care provider?
<p>Crying, Colic</p>	<ul style="list-style-type: none"> • Crying: How long does crying last? • Calming: What calming techniques have been tried? • Gas: Is the infant gassy? • Sleep: What is the infant's sleep pattern? • Spitting up: Is the infant spitting up during and after a feeding? • Cues: Is the infant stiffening legs, pulling up legs in pain, clenching fists? 	<ul style="list-style-type: none"> • Colic is defined as crying more than three hours per day, more than three days a week, for more than three weeks • Colic is common • Cause is not known • Usually begins during the first 2-6 weeks of life • Common at the end of the day • Usually stops by 3-4 months of age • Studies have shown that formula changes do not make a difference 	<p>Formula: Similac Advance</p> <ul style="list-style-type: none"> • Listening to an infant crying long periods of time can be stressful; acknowledge feelings of the caregiver • Encourage patience and asking for support from family and friends to provide break for caregivers • Follow steps above for fussy infant • Hold infant on left side/stomach <p>Handout to offer:</p> <ul style="list-style-type: none"> • Common infant problems: Colic 	<ul style="list-style-type: none"> • If nothing seems to be working, refer to the health care provider to assess for other underlying cause; colic may have nothing to do with breast milk or the infant formula • Ask health care provider before using any medications

What's the issue?	What to explore further?	What is common/ What is normal?	What formula, information to offer?	When to refer to the health care provider?
<p>Constipation</p>	<ul style="list-style-type: none"> ● Stooling patterns: How does the caregiver describe constipation? ● Mixing of formula: <ul style="list-style-type: none"> ▪ following mixing instructions ▪ if transitioning from one formula to another, is the transition going too quickly? ● What, if anything, is being added to the bottle? ● What else is being offered for the infant to eat or drink? ● Swaddling: Is the infant being wrapped up and unable to move? ● Activity: How much activity, movement is the infant getting throughout the day? ● Recent illness: Is the fluid loss due to vomiting, fever, recent bout of diarrhea? ● Medications: What medications is the infant taking, if any? 	<ul style="list-style-type: none"> ● Normal stooling pattern: <ul style="list-style-type: none"> ▪ occurs frequently in the first month and slows down by 8 weeks of age ▪ stools pass easily, even after a few days of no bowel movement ▪ normal frequency varies greatly between infants ● Constipation is defined as hard, dry stools that are difficult to pass ● Related signs: <ul style="list-style-type: none"> ▪ upset, swollen or hard stomach ▪ fussiness ▪ raw or bleeding rectum ● Common causes: <ul style="list-style-type: none"> ▪ not enough fluids ▪ changing to infant formula or changing to a new formula too quickly ▪ adding solid foods too early ▪ mixing formula incorrectly ▪ lack of movement or activity by the infant ▪ side effects of certain medications 	<p>Formula: Similac Advance, powder or concentrate</p> <ul style="list-style-type: none"> ● Stools change color during the first weeks of life ● Stooling patterns change quickly during infancy and each infant can have a different stooling pattern ● Change in color of stool is normal during infancy ● Depending on the age of the infant, 1-2 oz water or 100% fruit juice may be offered (refer to handout for more information) ● Increase movement, activity of the infant <p>Handouts to offer:</p> <ul style="list-style-type: none"> ● Does my baby have constipation? ● Common infant problems: Constipation 	<p>Refer to the health care provider if infant is showing signs of:</p> <ul style="list-style-type: none"> ▪ prolonged constipation ▪ vomiting ▪ blood in the stools ▪ refusing to feed ▪ fever ▪ growth faltering ▪ Or, if caregiver is wanting to provide medications or mechanical stimulation to help constipation (e.g. laxatives, stool softeners, etc.) as these are not appropriate for all infants

What's the issue?	What to explore further?	What is common/ What is normal?	What formula, information to offer?	When to refer to the health care provider?
<p>Diarrhea</p>	<ul style="list-style-type: none"> ● Stooling patterns: How does the caregiver describe diarrhea? ● Formula preparation and safety: <ul style="list-style-type: none"> ▪ How are the bottles, water prepared? ▪ How long is formula being kept at room temperature? ▪ What happens to leftover formula? ● Sanitation: <ul style="list-style-type: none"> ▪ How often are hands washed, especially before making bottles, after changing diapers? ▪ How often are toys washed? ● Illness: Exposure to others with diarrhea? ● What foods or fluids from others are being shared? ● What other fluids are being provided: raw milk, unpasteurized milk or juice? (not recommended) 	<ul style="list-style-type: none"> ● Defined as three or more watery stools in one day or if stools become more frequent or watery than usual ● It is important to treat the cause of the diarrhea, to prevent dehydration ● Diarrhea caused by lactose intolerance (also known as primary lactase deficiency) is uncommon before 2 to 3 years of age in all populations. ● Loose, watery stools that happen after a stomach illness is called secondary lactase deficiency. The stomach illness needs to be addressed. The gut may benefit from a temporary rest from lactose containing formulas. 	<p>Formula: Similac Advance</p> <p>Once cause for diarrhea is determined, one month issuance of lactose free formula (e.g. Prosobee) or partially hydrolyzed formula (Alimentum or Nutramigen) may be considered.</p> <ul style="list-style-type: none"> ● Underlying cause of diarrhea needs to be identified ● Continue with breast feeding or formula feeding to keep hydrated ● Follow the mixing instructions on the can, do not over dilute formula ● Juice, sports drinks, soft drinks can make the problem worse <p>Handout to offer:</p> <ul style="list-style-type: none"> ● Common infant problems: Diarrhea 	<p>Contact health care provider immediately if:</p> <ul style="list-style-type: none"> ▪ infant seems cold, without energy, limp, or will not wake up ▪ dry, sunken eyes, mouth or tongue, or cries without tears ▪ blood, mucus or pus in the diaper or stool or black stools after 4 days of age ▪ vomiting ▪ fever <p>Note: Refer to your WIC Nutritionist or health care provider for further assessment of whether the infant would benefit from a short trial of a special medical formula requiring medical documentation</p>

What's the issue?	What to explore further?	What is common/ What is normal?	What formula, information to offer?	When to refer to the health care provider?
<p>Food Allergy</p>	<ul style="list-style-type: none"> ● Explore symptoms, signs of food allergy ● Signs of food allergy include: <ul style="list-style-type: none"> ▪ hives (red spots), itchy skin rashes, or swelling ▪ sneezing, congestion, wheezing or tight throat ▪ nausea, vomiting or diarrhea ▪ pale skin, drop in heart rate 	<ul style="list-style-type: none"> ● A food allergy is when the body's immune system reacts negatively to the protein in foods ● The reaction occurs right after eating the food ● Reactions range from mild to severe ● Food allergy to cow's milk, protein (casein or whey) intolerance is reported to occur less than 5% of infants within the first 1 to 3 months of life, and typically goes away by 1 year of age. ● Most children outgrow food allergies 	<p>Formula: In the case of milk protein allergy, the health care provider will need to determine the special medical formula</p> <p>For an infant with a family history of food allergies:</p> <ul style="list-style-type: none"> ● If the infant is partially breast fed, encourage breast feeding as much as possible ● Encourage waiting to feed solids until 6 months of age ● When ready for solids, encourage waiting 5-7 days to watch for signs of allergies before offering a new food <p>Handout to offer:</p> <ul style="list-style-type: none"> ● Common infant problems: Food Allergies 	<ul style="list-style-type: none"> ● Food allergies can result in a severe life-threatening reaction called anaphylaxis ● Call 911 if an infant has a severe reaction in clinic ● Infants displaying symptoms of a food allergy, refer to health care provider or gastrointestinal specialist for evaluation of food allergies

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Participant Handouts

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Common Infant Problems: Food Allergies

*Common Infant Problems: Changing Your Baby
to a New Formula*

Common Infant Problems

(Birth – 1 year)

Crying

* Why do babies cry?

Crying is one way a baby talks to you. As you get to know your baby, you will learn what he wants. Crying may be a sign of a problem, so it is important to respond quickly when your baby cries. A quick response also helps your baby calm down faster.

Babies may cry when they are thirsty or hungry, have a wet diaper, or when they are too hot or too cold. Babies also cry when they are uncomfortable, bored, in need of attention, afraid, or hurt. Some babies may cry late in the day, when they are too tired or too excited.



* What can I do?

- **Thirsty or hungry** – Watch for signs of hunger, such as sucking on his lips, finger, or fist. Feed your baby before he gets too upset.
- **Wet diaper** – Change a wet or dirty diaper as soon as you know it is wet.
- **Too cold or too hot** – Take off or put on clothes or blankets to help keep your baby comfortable.
- **Uncomfortable** – Change his position in his bed or carrier. He may be stuck in an odd position, such as lying on his arm.
- **Bored or in need of attention** – Hold, rock, play with, or touch your baby. Play music, sing, talk, or read to him.
- **Too excited or afraid** – Hold, rock, and talk softly to calm your baby. If the room is noisy, try to make it quieter. Place the baby on your chest, skin to skin. Some babies like to be wrapped snugly in a blanket.
- **Stomach pains or colic** – Lay your baby on his stomach across your legs and gently pat his back or rock him.
- **Hurt** – Check for red marks or scratches. Make sure diapers and clothing are put on comfortably.
- **Tired** – He may need to sleep. Try placing him on his back and see if he settles down.



What if nothing seems to help?

If your baby continues to cry and you have checked for all of the above, your baby may be sick. Call your doctor or clinic for help if your baby has:

- A body temperature above 99°F
- Watery stools
- Vomiting
- Fewer than 6 to 8 wet diapers in a day
- A skin rash
- Crying that will not stop

Remember: **Respond quickly when your baby cries.** Although crying is natural, too much crying may not be good for a baby. You cannot spoil your baby by holding him. Holding your baby will comfort him and make him feel loved and secure.

If you or your partner get upset with your baby's constant crying, call your doctor, a friend, or the Shaken Baby Alliance at 1-877-636-3727 (1-800-6-END-SBS), 9 a.m. – 5 p.m. or ChildHelp USA 1-800-422-4453 (1-800-4-A-CHILD) anytime.



For more information on infant crying visit the Mayo Clinic www.mayoclinic.com/health/healthy-baby/PR00037 or search for “crying baby” on Medline Plus <http://www.nlm.nih.gov/medlineplus>.

Common Infant Problems

(Birth – 1 year)

Colic

* Is my baby crying because she has colic?

Listening to a baby cry for long periods of time can cause you stress and even anger. Babies cry for many reasons, but some cry because they have colic.

* What exactly is colic?

The cause of colic is not known, even though it is a common problem. Babies can be fussy, but babies with colic have long periods of sudden, unexplained crying that will not stop. The crying may be due to stomach pain.

Doctors often say a healthy baby is colicky if the baby:

- Cries for more than three hours per day, more than three days a week, for more than three weeks.
- Begins this process during the first 2 to 6 weeks of life.
- Stops by 3 to 4 months of age.

Other signs of a colicky infant may include:

- Hard to calm down
- Stiffening of legs, pulling legs up in pain, clenching of fists
- Passing a lot of gas
- Spitting up and crying during and after a feeding
- Not sleeping for very long at a time

Breastmilk oversupply (too much breastmilk) can cause colic in the breastfed baby. Moms with breastmilk oversupply often have constant breast fullness, leaking during and between feedings, and strong milk let-down.



* What can I do?

Although there's no cure for colic, try the following to calm a fussy, crying infant:

- Play calming music or talk quietly to your baby.
- Give your baby a gentle massage.
- Place your baby on your chest, skin to skin.
- Wrap your baby snugly in a blanket (swaddle).
- Hold your baby on his side/stomach.
- Gently swing or rock your baby in your arms.

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What can I do?

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- Make a loud “shushing” sound in your baby’s ear.
- Take your baby for a car ride or a brisk walk outside in a stroller.
- Do not give juice, especially apple, white grape, or pear juice – they may cause gas.
- If your breastfed baby has signs of colic and you have signs of breastmilk oversupply, talk to your WIC breastfeeding counselor or visit www.breastmilkcounts.com to learn what you can do about breastmilk oversupply.



* What if nothing seems to work?

1. Take your baby to the doctor or clinic to see if she has a medical problem. Colic may have nothing to do with your breastmilk or the infant formula you feed your baby. Still, it’s important to let your doctor make sure.
2. Ask your doctor before using any medications.
3. No matter how upset or angry you feel, do not shake your baby. Shaking can cause serious problems, including brain damage or even death. Let someone calmer help with the baby. If you or your partner needs help with your baby’s constant crying, call the Shaken Baby Alliance at 1 (877) 636-3727 (1-877-6-END-SBS).
4. Remember: be patient — and get someone to help you. Colic usually goes away within three to four months.

For more information on colic, visit the American Academy of Pediatrics www.aap.org/topics.html
or the Mayo Clinic www.mayoclinic.com/health-information.

Constipation

* How do I know if my baby is constipated?

Your baby will have fewer bowel movements than usual. His stools may be hard, dry, and difficult to pass. Other signs include:

- Upset, swollen, or hard stomach.
- A fussy baby.
- A raw or bleeding rectum (area between buttocks).
- Fever, loss of appetite, nausea, vomiting, weight loss, or poor weight gain.



What's normal?

During the first few days of life, babies have dark, sticky stools called meconium. These stools were in the baby before birth. The stools change color around days four to six. Although each baby is different, newborns have stool habits something like the following:

Breastfed Newborns

Breastfed babies often stool after every feeding during the first month of life.

Formula-fed Newborns

Week 1: four to five stools per day

Weeks 2 – 4: around two stools per day

At about one month, breastfed and formula-fed babies may have fewer stools each day or a stool every few days.

In general, stools are considered normal if they:

- Are not watery.
- Do not happen more than three times in one day, although some healthy babies may have more.
- Are not too dry and hard.
- Pass easily even after a few days with no bowel movements.

* What causes constipation?

- Not enough fluids (breastmilk or formula) or solid foods (if 6 months or older).
- Changing from breastmilk to infant formula or changing to a new infant formula.
- Adding solid foods to your baby's diet, including adding cereal to the bottle.
- Mixing infant formula with too much or too little water.

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What causes constipation?

(Continued from other side)

- Feeding cereal or other solid foods to an infant under 4 months old.
- Water loss due to vomiting, fever, or hot weather.
- Lack of physical movement or activity by the infant.
- Side effects of certain medicines.

Infants with certain medical conditions such as Down syndrome and cerebral palsy are more likely to have constipation. Your doctor can recommend the best treatment for these conditions.

When should I call the doctor or clinic?



Call the doctor if:

- You have tried all of the above, and your baby is still constipated.
- Your newborn does not pass meconium in the first day or two of life.
- Your baby vomits, has blood in the stools, has a bloated tummy, refuses to feed, or has a fever over 99°F.

What can I do to prevent constipation?

Do:

- Breastfeed your baby.
- Mix infant formula and infant cereal according to directions.
- If your baby is under 6 months old, increase fluids such as breastmilk or formula.
- If he is constipated, offer 2 ounces of water twice a day and, if your doctor advises, 1 to 2 ounces of 100 percent prune, pear, or apple juice. (Juice is generally not recommended for infants less than 6 months old, except when treating constipation.)
- Wait to feed infant cereal until your baby can sit up with help, opens his mouth for a spoon, and can keep most of the cereal in his mouth — about 6 months old.
- If your baby is 6 months or older, feed more mashed fruits and vegetables and 2 to 3 ounces of 100 percent prune, pear, or apple juice.
- Increase activity by moving your baby's legs in a bicycle fashion and allow more play time on the floor.

Do not:

- Give your baby honey. It could give your baby infant botulism, a type of food poisoning.
- Add cereal to your baby's bottle, unless your baby's clinic or doctor tells you to.
- Give your baby any medicine, laxatives, suppositories, or enemas to cause a bowel movement unless your baby's clinic or doctor tells you to.
- Insert objects, such as a thermometer, into your baby's rectum.

For more ideas on how to relieve constipation, visit the American Academy of Pediatrics www.aap.org/topics.html or the Mayo Clinic www.mayoclinic.com/health/infant-constipation/AN01089.

Diarrhea

* What is diarrhea?

Your baby has diarrhea when he has three or more watery stools (bowel movements) in one day or when his stools become more frequent and watery than usual. It is important to treat the cause of the diarrhea first. Diarrhea can be harmful if it is not treated quickly because a baby may lose too much fluid, this can cause dehydration.

* If my baby begins to have diarrhea, what should I do?

- Continue with breastfeeding or formula feeding to help slow down the amount and how often a baby has a stool.
- Do not switch infant formulas unless your doctor says you should.
- Do not add extra water to dilute infant formula.
- Infants fed solid foods can continue to eat their usual foods, but give more complex carbohydrates (rice, wheat, potatoes) and meats.
- Do not give juices, soft drinks, and sport drinks since these have simple sugars which can make the problem worse.
- Do not withhold food for more than 24 hours. Do not feed the “BRAT” diet (bananas, rice, applesauce, and toast) alone — these can decrease calorie and nutrient intake.



* If my baby has severe diarrhea or dehydration, what should I do?

If your baby has any of the following problems, call your doctor or clinic **NOW**:

- Seems cold, without energy, limp — or will not wake up.
- Dry, sunken eyes, dry mouth or tongue, or cries without tears.
- Blood, mucus, or pus in the diaper or stool, or black stools after 4 days of age.

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If my baby has severe diarrhea or dehydration, what should I do?

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- Vomiting or weight loss.
- Dark, yellow urine in the diaper or no urine for over 6 hours.
- Refuses to breastfeed or take a bottle.
- More than three watery stools in one day or diarrhea that lasts more than one day.
- A fever above 99°F.

Ask your doctor about giving fluids and electrolyte solutions such as Pedialyte to your baby. Electrolyte solutions should be given to infants only under the supervision of a doctor. Do not give medicine to your baby unless your doctor tells you to.



* What can I do to help prevent diarrhea?

- Wash your hands with soap and water:
 - Before making your baby's food or bottles.
 - Before feeding your baby.
 - After using the toilet, changing diapers, sneezing, or coughing into your hands.
- Wash your baby's hands often and clean under his fingernails with soap and water.
- Regularly wash any toys or things your baby puts into her mouth.
- Breastfeed your baby.
- Boil bottles and equipment for breastmilk or formula.
- For babies 3 months and younger, boil water used for making formula.
- Throw away breastmilk or formula left in the bottle after each feeding.
- Keep prepared or open cans of formula in the refrigerator. Throw them away after two days.
- Never feed right out of a jar of baby food. Always use a clean spoon to take the baby food from the jar and put it on a dish. When your baby is done eating, throw away any baby food left on the dish.
- Wash all fresh fruits and vegetables.
- Refrigerate foods after you use them.
- Do not give your baby:
 - Raw milk or juice that has not been pasteurized.
 - More than 4 ounces of fruit juice a day. If your baby is less than 6 months old, do not give any juice.
 - Food from your mouth, fork, or spoon.

For more information on treating diarrhea visit Kids Health www.kidshealth.org
or the American Academy of Pediatrics www.aap.org/topics.html.

Spitting Up

* The “Happy Spitter”

Spitting-up is common in babies, in fact, half of all infants spit up. Spitting up is normal and does get better over time. Babies who spit up can be happy and healthy. If your baby is otherwise healthy, there is no need to worry.



* What helps prevent spitting up?

- Do not overfeed. If your baby spits up during a feeding, stop and wait until the next feeding.
- Offer smaller, more frequent feedings.
- Take time to burp half way through the feeding.
- Make feedings calm and relaxed.
- Positioning after meals:
 - ♦ Avoid laying him down to change his diaper right after feeding.
 - ♦ Keep your baby upright for 30 minutes.
 - ♦ Try holding your baby on his left side or on his tummy at a slight angle with his head and shoulders up higher than his legs.
 - ♦ Avoid putting your baby in a car seat position or bouncy, vibrating baby chair.
- Make sure clothing and diapers are not too tight.
- Avoid smoking around your baby.



*** How much should my baby drink?**

Breastfed Infants:	
Birth – 2 months	8 - 12 or more feedings in 24 hours
2 months – 6 months	6 - 10 or more feedings in 24 hours
Formula-Fed Infants:	
7 – 8 lbs	16 - 23 oz (2 - 4 oz every 2 to 3 hours)
8 – 10 lbs	21 - 26 oz (3 - 5 oz every 3 to 4 hours)
10 – 12 lbs	24 - 28 oz (4 - 6 oz every 3 to 4 hours)
12 – 16 lbs	29 - 39 oz (5 - 8 oz every 3 to 4 hours)

A healthy baby will drink about ½ oz of formula per pound of body weight at each feeding until he is eating solid foods. Your baby is getting enough to eat if he is gaining weight and growing.



Take your baby to the doctor if he is:

- Not gaining weight.
- Vomiting forcefully or vomiting blood or green or yellow fluid.
- Crying and irritable when spitting up.
- Arching backwards when feeding.
- Refusing food or having trouble eating.
- Having trouble breathing.
- Coughing or wheezing during or after feeding.

For more information on spitting up, visit the American Academy of Pediatrics www.aap.org/topics.html or the National Digestive Diseases Information Clearinghouse <http://digestive.niddk.nih.gov/ddiseases/a-z.asp>.

Common Infant and Childhood Problems

(Birth – 5 years)

Food Allergies

* What are food allergies?

A food allergy is when the body's immune system reacts negatively to the proteins in foods. The reaction occurs right after eating the food. These reactions can range from mild to severe.



* How do I know if my child has a food allergy? Signs your child may have:

- Hives (red spots), itchy skin rashes, or swelling
- Sneezing, congestion, wheezing, or tight throat
- Nausea, vomiting, or diarrhea
- Pale skin, light-headedness, or drop in heart rate

If your child is experiencing several signs listed above or is having trouble breathing, the reaction could be a severe, life-threatening reaction called anaphylaxis. **Call 911 if your child has a severe reaction.**

* What are the most common foods that cause allergies?

- Dairy, such as cow's milk, cheese, cream, yogurt, butter, sour cream, ice cream, and cottage cheese
- Eggs
- Wheat
- Soy
- Peanuts
- Nuts from trees, such as pecans, walnuts, and pistachios
- Fish, such as tuna, salmon, and cod
- Shellfish, such as shrimp and lobster

Although these are the most common food allergens, any food can cause a reaction.



* How can I help prevent food allergies?

- Breastfeed exclusively (feed only breastmilk) for about the first 6 months of life.
- Do not give foods other than breastmilk or formula before your baby is 4 to 6 months old.
- Give one new food at a time. Wait 5 to 7 days to watch for signs of allergies before giving another new food. If your baby has signs of a food allergy, wait a few months before giving that food again. Unless your doctor tells you otherwise:
- You do not need to cut out common food allergens from your diet while pregnant or lactating.

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How can I help prevent food allergies?

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- Feeding a common food allergen to your baby after 6 months of age is OK, and it does not increase the chance of your baby developing a food allergy.



If your child is showing signs of a possible food allergy:

- Take your child to the doctor to have allergy tests done.
- Read the entire food label to look for common food allergens, and talk to a dietitian for help.
- Most children outgrow food allergies.
- Your child may need a vitamin/mineral supplement.

If you are breastfeeding and your child is showing signs of possible food allergies:

- Your baby may be having an allergic reaction to something you are eating.
- Stop eating the common food allergens listed above, starting with all dairy foods.
- If your child is still having signs of allergies after two weeks of eating no dairy foods, stop eating eggs next. Keep going down the list of common foods that cause allergies until your baby's signs of allergy go away.

The following are not a food allergy:

- Lactose intolerance, or sensitivity to the Lactose sugar in dairy foods, is not the same as a food allergy. Infants and children with lactose intolerance have bloating, gas, diarrhea, and stomach aches after drinking or eating milk products.
- Vomiting, diarrhea, and upset stomach can also be due to food poisoning or certain diseases such as Celiac disease.



For more information on food allergies, visit The Food Allergy and Anaphalaxis Network www.foodallergy.org or the Asthma and Allergy Foundation of America www.aafa.org.

For more information on food allergies and breastfeeding, visit www.kellymom.com.

Changing Your Baby to a New Formula

- ♥ If you need to change from one formula to another, it may be easier for your baby if you do it gradually over several days, rather than all at once.
- ♥ If your baby is taking a special medical formula, follow your doctor's instructions for changing formulas.

Most babies will drink any formula. Each one tastes a little different. Some babies notice this difference and it will help to begin using the new formula slowly. Here is one method for changing your baby to a new formula.



How to change your baby to a new powdered formula 8 oz. bottle example

You will need about 2 cans of the old powder formula to mix with the new one.

1. First few days	Mix: 8 ounces water 1 scoop new formula 3 scoops old formula	
2. Then try (next few days)	Mix: 8 ounces water 2 scoops new formula 2 scoops old formula	
3. Finally (by the end of the 7 th day, or longer if needed)	Mix: 8 ounces water 3 scoops new formula 1 scoop old formula	
4. All new formula	Mix: 8 ounces water 4 scoops new formula	

♥ How to change your baby to a new liquid concentrate formula is on the other side. ♥

How to change your baby to a new liquid concentrate formula

8 oz. bottle example

You will need about 6-8 cans of the old liquid concentrate formula to mix with the new one.

5. First few days	Mix: 4 ounces water 1 ounce new formula 3 ounces old formula	
6. Then try (next few days)	Mix: 4 ounces water 2 ounces new formula 2 ounces old formula	
7. Finally (by the end of the 7 th day, or longer if needed)	Mix: 4 ounces water 3 ounces new formula 1 ounce old formula	
8. All new formula	Mix: 4 ounces water 4 ounces new formula	

♥ Need more guidance? Talk with a WIC staff member—we're here to help! ♥



Glossary and References

Contents

Glossary

References

Glossary

Allergen — A substance that is foreign to the body and can cause an allergic reaction in certain individuals.

Amino acids — The building blocks of proteins.

Anaphylactic reaction — A rare, but severe, allergic response that can be fatal.

Antigen—A substance that the immune system perceives as being foreign or dangerous.

Antibody — An immunoglobulin, a specialized immune protein, produced because of the introduction of an antigen into the body, and which possesses the remarkable ability to combine with the very antigen that triggered its production.

Arachidonic acid (ARA) — Special fats important for healthy infant growth and visual and mental development; found in breastmilk.

Aspirate — To inhale fluid into the lungs.

Atopic dermatitis— a disease on the surface of the skin resulting in severe itching, redness, scaling, and/or skin loss.

Bile—a yellow-green fluid made by the liver and stored in the gallbladder, it passes into the small intestine where it helps digest fat.

Biliary atresia — Blockage in the tubes (ducts) that carry bile from the liver to the gallbladder.

Bilirubin—A yellow orange compound that is produced by the breakdown of hemoglobin from red blood cells, it is the pigment in bile.

Carnitine — An amino acid that serves an important and specific role in the cell, can be synthesized from amino acids cysteine and lysine, and can be found added to infant formulas and in a diet that contains animal food sources.

Casein — The principle protein in cow's milk that form curds in the stomach, which is difficult to digest.

Cholestasis — A condition in which little or no bile is secreted or the flow of bile into the digestive tract is obstructed.

Chylothorax — The presence of lymphatic fluid in the pleural space between the lungs and chest wall secondary to leakage from the thoracic duct or one of its main tributaries.

Colic — Periodic inconsolable crying in a healthy young infant, associated with sharp abdominal pain.

Constipation — The frequency or quantity of stools is reduced; may include symptoms of difficult passage, blood in stools, or abdominal pain.

Cystic fibrosis — A genetic disorder characterized by the dysfunction of the exocrine glands (sweat glands) and production of abnormally thick secretions that obstruct airways and pancreatic and other ducts.

Dehydration — Excessive loss of body water

Docosahexaenoic acid (DHA) — Special fats important for healthy infant growth and visual and mental development; found in breastmilk.

Diarrhea — A change in bowel movement which may be more frequent, more watery, or larger than usual.

Emulsifiers — Compounds that hold fat in water and prevent separation.

Enteropathy — A disease of the intestine.

Enterocolitis — Inflammation of the mucous membrane of the small and/or large intestine.

Eosinophilic esophagitis — A chronic inflammatory condition of the esophagus. Can be caused by dietary protein. Although rare in infants, symptoms can mimic gastroesophageal reflux disease. Diagnosed by esophageal biopsy.

Fluoride — A mineral essential to tooth and bone formation that can be toxic in excess amounts.

Fluorosis — A hypomineralization of the enamel surface of the tooth that develops during tooth formation; damage to the

permanent teeth can range from white lines or spots to pitting and staining of the outer enamel layer.

Food hypersensitivity — A negative food reaction involving the immune system; also referred to as food allergy.

Food intolerance — A negative food reaction not involving the immune system.

Galactosemia — An inherited disorder characterized by a condition in which the body is unable to metabolize the simple sugar galactose. Milk (human or animal) cannot be tolerated in any form.

Gastroenteritis—Inflammation of the stomach and intestines.

Gastroesophageal-reflux disease (GERD) — Backward flow of the stomach contents into the esophagus; may result in poor growth, pain, or respiratory illness.

Glucose polymer — Polysaccharides composed of repeating glucose units. They can consist of branched or unbranched chains in any linkages.

Hydrolysis — An enzymatic reaction in which a compound is broken down by adding water.

Hypertonia — High skeletal muscle tone, muscle tightness.

Hypotonia — Low skeletal muscle tone, often called “floppy.”

Immunoglobulin—A protein produced in the blood that plays an essential role in the immune system by attacking foreign substances such as antigens.

Jaundice — Common condition in newborns in which high levels of bilirubin in the blood cause the infant’s skin and whites of the eyes to turn yellow.

Lactalbumin — An easy-to-digest protein found in human milk.

Lactase — An intestinal enzyme that breaks down lactose.

Lactoglobulin — The major protein in cow’s-milk whey.

Lactose — The main sugar in the milk of mammals.

Lactose intolerance — Inability to digest lactose due to a lack of the enzyme lactase.

Long-chain-3-hydroxyacyl-coenzymeA dehydrogenase (LCHAD) deficiency — A rare condition that prevents the body from converting certain fats to energy, particularly during periods without food (fasting).

Meningitis — Inflammation of the meninges (tissue membranes that protect the brain and spinal cord), that is most commonly due to bacterial infection, but sometimes caused by viral or fungal infections. Symptoms include headache, stiff neck, fever, nausea, vomiting, and intolerance to light and sound, often followed by convulsions and delirium.

Methionine — An essential amino acid added to infant formulas to enhance the quality of the protein.

Necrotizing enterocolitis (NEC) — Inflammation or death of the gastrointestinal tract; potentially fatal disease associated with specific symptoms such as abdominal distention and tenderness, abnormal gastric residuals, and grossly bloody stools.

Nucleotides — The building blocks of DNA and RNA.

Oral-rehydration solution (ORS) — A drink made from a specific recipe of minerals, sugar, and water used to replace the minerals and water lost after dehydration.

Pancreatic insufficiency – The inability to properly digest food due to a lack of digestive enzymes made by the pancreas.

Peptides — A molecule consisting of two or more amino acids which are smaller and may be easier to digest than proteins with larger amino acid.

Pica — A medical disorder characterized by an appetite for substances largely non-nutritive value (e.g. clay, coal, sand, soil, chalk, paper, etc.).

Polysaccharides—A large form of carbohydrate such as starch, cellulose and glycogen.

Prebiotic — Non-digestible food products that stimulate the growth or activity of bacteria already present in the digestive tract; may improve gastrointestinal health.

Probiotic — Food or concentrate of live organisms that contribute to a healthy microbial environment and suppress potential harmful microbes.

Prone — To lie face down; lying on the stomach.

Pyloric stenosis — Narrowing of the opening of the pylorus.

Rehydration — Restoring the fluid lost from a body due to diarrhea or vomiting.

Sepsis — Bacterial infection in the bloodstream or body tissues.

Short-bowel syndrome — A malabsorption syndrome resulting from major resections on the small bowel; characterized by diarrhea, steatorrhea (excessive amounts of fat in feces), and malnutrition.

Sorbitol — The alcohol form of sucrose (table sugar) that is absorbed more slowly than sucrose and inhibits the rise in blood glucose. Because of slow absorption, it can cause soft stools or diarrhea.

Soy-protein isolate — The protein portion of soy without the carbohydrate, or fat content, of natural soy products.

Spitting up — A mild form of gastroesophageal reflux that does not affect growth or health.

Sucrase — The intestinal enzyme that breaks down sucrose.

Supine — To lie face up on the back.

Taurine — An amino acid that serve important and specific in the cell, can be synthesized from amino acids cysteine and lysine, and can be found added to infant formulas and in a diet that contains animal.

Vomiting — The forceful expulsion of the contents of the stomach.

Whey — The proteins remaining in the watery fraction of milk after the curd and cream have been removed; contains lactalbumin.

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Posttest

Posttest

1. There are many components in breastmilk that cannot be duplicated by infant formula.
 - A. TRUE
 - B. FALSE

2. In standard milk-based infant formulas, the carbohydrate is _____, the fats are _____, and the proteins are _____ and _____.
 - A. Lactase, animal oils, casein/whey
 - B. Lactose, vegetable oils, casein/whey
 - C. Lactose, animal oils, casein/whey
 - D. Lactase, vegetable oils, casein/whey

3. All infant formulas must meet the minimum and maximum nutrient requirements established by the _____.
 - A. American Academy of Pediatrics
 - B. Congressional Act for Formula Production
 - C. Infant Formula Act of 1980
 - D. Formula manufacturers

4. Identify the three forms of infant formula:
 - A. Powder, concentrate and ready to use
 - B. Abbot, Mead Johnson and Gerber
 - C. Cows milk based, goat's milk based and soy based
 - D. Emulsified, hydrolysed and thickened

5. It is ok to heat infant formula or expressed breastmilk in the microwave.
 - A. TRUE
 - B. FALSE
6. Which of the following is not an infant formula modification to meet a specific health need?
 - A. Lactose free or reduced
 - B. Added rice starch
 - C. Added emulsifiers
 - D. Hydrolyzed protein
7. Post discharge formulas for premature Infants:
 - A. Provide 22 calories per ounce and higher levels of some vitamins, minerals and protein than standard infant formulas
 - B. Are used for some premature infants with low birth weights after they are released from the hospital
 - C. Are not intended for full term infants
 - D. All of the above
8. There is conclusive evidence that protein hydrolysate formulas work well in treating colic.
 - A. TRUE
 - B. FALSE
9. There is less chance of an allergic reaction from small protein particles.
 - A. TRUE
 - B. FALSE

10. Cow's milk should not be given to an infant before one year of age because:
- A. Cow's milk contains very little iron, vitamin E, vitamin C and other nutrients compared to breastmilk or infant formula
 - B. Cow's milk can cause blood loss from the intestinal tract due to the large size of the milk protein.
 - C. Cow's milk is higher in protein and nutrients as compared to breastmilk or infant formula and can put a strain on developing kidneys.
 - D. All of the above
11. Prepared formula may be safely stored at room temperature for up to _____.
- A. 30 minutes
 - B. 1 hour
 - C. 24 hours
 - D. 8 hours
12. Which of the following is not an important aspect of mixing powdered infant formula?
- A. Use the scoop that is included in the can according to the manufacturer's instructions
 - B. Start by measuring water into a clean container
 - C. Sanitize the scoop at least once a week
 - D. Stir or shake the mixture thoroughly once the formula has been added to the water
13. Water intoxication can result when a family is running low on formula and tries to "stretch" the formula by adding extra water.
- A. TRUE
 - B. FALSE

14. Constipation can be caused by a variety of factors or conditions such as:
- A. Diet
 - B. Use of certain medications
 - C. Lack of movement or activity
 - D. All of the above
15. Constipation in infants may be caused by the dietary influences listed below except for:
- A. Consumption of iron fortified formula
 - B. Inadequate intake of fluid
 - C. Improper dilution of infant formula
 - D. Early introduction of complementary foods
16. Diarrhea in infants could be caused by:
- A. Excessive juice consumption
 - B. Consuming contaminated food or water
 - C. Medical conditions or infections
 - D. All of the above.
17. If untreated, diarrhea in an infant can rapidly lead to dehydration, so it is important to:
- A. Recommend that sports drinks and juice be given to the infant
 - B. Refer the infant to the HCP for a medical evaluation
 - C. Recommend that all infant foods be discontinued
 - D. Recommend a BRATT diet
18. Colic, while the cause is unknown, is described as prolonged, inconsolable crying that appears to be related to stomach pain or discomfort.
- A. TRUE
 - B. FALSE

19. The following suggestion can be provided for an infant with symptoms of colic:
- A. Give the infant apple, white grape or pear juice
 - B. Add cereal to the bottle so the infant will sleep through the night
 - C. Use infant massage, soothing music and holding the infant skin to skin
 - D. Give herbal teas with sorbitol
20. Gastroesophageal Reflux or GER can range from mild spitting up to a severe form that causes aspiration, failure to thrive, lung disease and/or esophageal inflammation.
- A. TRUE
 - B. FALSE
21. The treatment of Gastroesophageal Reflux Disease (GERD) must be prescribed by a doctor and may consist of:
- A. Smaller and more frequent feedings and positioning
 - B. Surgery
 - C. Medication
 - D. All of the above
22. If an infant is “spitting up” formula, it could be due to:
- A. Overfeeding
 - B. Swallowing air before or during feeding
 - C. Excessive stimulation
 - D. All of the above
23. The terms “milk allergy” and “lactose intolerance” have the same meaning.
- A. TRUE
 - B. FALSE

24. An anaphylactic reaction is a whole body response to an allergen. Symptoms can include an irregular heartbeat, changes in blood pressure, shock, and even death if not treated promptly.
- A. TRUE
 - B. FALSE
25. The benefits of holding the baby during the feeding listed below are true with the exception of:
- A. The baby benefits from contact from the caregiver
 - B. Increases the risk of aspiration
 - C. Helps caregivers understand behavioral cues of hunger and fullness
 - D. Helps reduce the risk of ear infections



Evaluation

Training Module Evaluation

For the first five questions, circle the answer that best reflects your opinion.

1. Overall, I think the training module was (circle number):

A waste of time		Okay		Very valuable
1	2	3	4	5

2. This training gave me...(circle number):

No new information		Reinforced information		New information
1	2	3	4	5

3. Based on what I learned, I feel like I can use the new skills I like (circle number):

No new skills		Reinforced skills		New skills
1	2	3	4	5

4. I found the format of reading, practice activities, skill checks and case studies to be (circle number):

Not useful		Okay		Very useful
1	2	3	4	5

5. I found the format of using resources, conducting observations, and having discussions with my Training Supervisor to be (circle number):

Not useful		Okay		Very useful
1	2	3	4	5

6. The part of the training module that was most useful/helpful was...
7. If I could add to or change any part of the online training module, I would...
8. The time it took for me to complete all of the Infant Formula Module chapters and activities was _____ hours.
9. I started working on this training module _____ (days/weeks/months) ago.
10. Check all that apply:
_____ I am a new staff person.
_____ I am an existing staff person.

Years in WIC/Maternal and Child Health _____