Memorandum

#17-043

TO:   WIC Regional Directors
      WIC Local Agency Directors

FROM:  Amanda Hovis, Director
        Nutrition Education/Clinic Services Unit
        Nutrition Services Section

DATE:  May 9, 2017

SUBJECT:  Clinic Assessment Manual and Participant Form Revisions

The United States Department of Agriculture (USDA) has updated three risk codes, 135 – Slowed/Faltering Growth Pattern, 359 – Recent Major Surgery, Trauma, Burns, and 460 – Inappropriate Nutrition Practices for Infants. Two participant forms and the Clinic Assessment Manual have been revised to reflect these changes. The implementation date for the revised forms and risk code assignments is **October 1, 2017**.

Revised materials include:
- Infant Participant Form (WIC-36)
- Child Participant Form (WIC-38)
- Clinic Assessment Manual (13-06-11842)

In preparation for implementing the revised materials, please complete the survey no later than **Wednesday, May 31, 2017** at


Please begin depleting your current inventory of Infant and Child Participant forms prior to October 1, 2017.

All revised materials will be distributed to each Local Agency based on the survey results. Since larger agencies may need materials distributed to multiple sites due to geographical reasons, please complete a survey for each site.

*This institution is an equal opportunity provider*
Brief descriptions of the Risk Code revisions are outlined below and the three codes are attached to this memo.

- **135 Slowed/Faltering Growth Pattern**
  Previously titled *Inadequate Growth*. The *Definition/Cut-Off Value* section is revised to reflect the current scientific literature related to growth faltering in infants. The *Participant Category* section no longer includes children, as the literature does not support identification of slowed or faltering growth based on weight measurements alone for children. The *Definition, Justification, Implications for WIC Nutrition Services* and *Reference* sections have been expanded and updated.

- **359 Recent Major Surgery, Trauma, Burns**
  The Definition section is unchanged. The *Justification, Implications for WIC Nutrition Services* and *Reference* sections have been expanded and updated.

- **460 Inappropriate Nutrition Practices for Infants**
  Sections 460.3 (Routinely offering complementary foods or other substances that are inappropriate in type or timing), 460.7 (Routinely limiting the frequency of nursing of the exclusively breastfed infant when human milk is the sole source of nutrients), and 460.9 (Routinely using inappropriate sanitation in preparation, handling, and storage of expressed human milk or formula) are revised to be consistent with the WIC Learning Online Job Aid: *Infant Feeding Tips for Food Safety* (found at [Infant Feeding Tips for Food Safety](#)). The *Definition, Justification* and *Reference* sections have been revised and updated accordingly.

Brief Descriptions of changes made to the Participant Forms include:

- Infant Participant Form (stock # WIC-36): weight loss for infants updated to match new definition of risk code 135.
- Child Participant Form (stock # WIC-38): risk code 135 removed from form.

Brief Descriptions of changes made to the Clinic Assessment Manual (stock # 13-06-11842):

- Risk Codes: since Texas WIC has adopted USDA format, *Clarifications and Guidelines* will now be located after the *References* section.
- Instructions for Completing the WIC Certification Forms: definition of “Para” clarified to explain how to account for delivery of twins.
- High Risk Referrals section: referral guidelines added for each participant category.

If you have questions or require additional information please contact Tiffany Brown, WIC Certification Specialist Program Coordinator, at Tiffany.Brown@dshs.state.tx.us or (512) 341-4587.
135 Slowed/Faltering Growth Pattern

Definition/Cut-off Value

An inadequate rate of weight gain as defined below.

1. Infants from birth to 1 month of age:

<table>
<thead>
<tr>
<th>Age</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants from birth to 1 month of age</td>
<td>Excessive weight loss after birth; or Not back to birth weight by 2 weeks of age</td>
</tr>
</tbody>
</table>

2. Infants from birth to 6 months of age:

Based on 2 weights taken at least 1 month apart, the infant's actual weight gain is less than the calculated expected minimal weight gain based on the table below. See Attachment 135-A for metric equivalents and for examples.

<table>
<thead>
<tr>
<th>Age</th>
<th>Average/Day</th>
<th>Average/Week</th>
<th>Average/Mo</th>
<th>Average Weight Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth-1 mo</td>
<td>18 gm/day</td>
<td>4 1/2 oz/wk</td>
<td>19 oz/mo</td>
<td>1 lb 3 oz/mo</td>
</tr>
<tr>
<td>1 - 2 mos</td>
<td>25 gm/day</td>
<td>6 1/4 oz/wk</td>
<td>27 oz/mo</td>
<td>1 lb 11 oz/mo</td>
</tr>
<tr>
<td>2 - 3 mos</td>
<td>18 gm/day</td>
<td>4 1/2 oz/wk</td>
<td>19 oz/mo</td>
<td>1 lb 3 oz/mo</td>
</tr>
<tr>
<td>3 - 4 mos</td>
<td>16 gm/day</td>
<td>4 oz/wk</td>
<td>17 oz/mo</td>
<td>1 lb 1 oz/mo</td>
</tr>
<tr>
<td>4 - 5 mos</td>
<td>14 gm/day</td>
<td>3 1/2 oz/wk</td>
<td>15 oz/mo</td>
<td></td>
</tr>
<tr>
<td>5 - 6 mos</td>
<td>12 gm/day</td>
<td>3 oz/wk</td>
<td>13 oz/mo</td>
<td></td>
</tr>
</tbody>
</table>

3. Infants & Children from 6 months to 59 months of age:

Option I: Based on 2 weights taken at least 3 months apart, the infant's or child's actual weight gain is less than the calculated expected weight gain based on the table below. See Attachment 135-A for metric equivalents and for examples.

<table>
<thead>
<tr>
<th>Age</th>
<th>Average/Day</th>
<th>Average/Week</th>
<th>Average/Mo</th>
<th>Average/6 Mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-12 mos</td>
<td>9 g/day</td>
<td>2 1/4 oz/wk</td>
<td>9 1/2 oz/mo</td>
<td>3 lbs 10 oz/6 mos</td>
</tr>
<tr>
<td>12-59 mos</td>
<td>2 1/2 g/day</td>
<td>0.6 oz/wk</td>
<td>2.7 oz/mo</td>
<td>1 lb/6 mos</td>
</tr>
</tbody>
</table>
Option II: A low rate of weight gain over a six (6) month period (+ or - 2 weeks) as defined by the following chart. See Attachment 135-B for guidance on using measurements not taken within a 5-6 month interval.

<table>
<thead>
<tr>
<th>Age In Months at End of 6 Month Interval</th>
<th>Weight Gain Per 6 Month Interval in Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>≤ 7</td>
</tr>
<tr>
<td>9</td>
<td>≤ 5</td>
</tr>
<tr>
<td>12</td>
<td>≤ 3</td>
</tr>
<tr>
<td>18-60</td>
<td>≤ 1</td>
</tr>
</tbody>
</table>

Participant Category and Priority Level

<table>
<thead>
<tr>
<th>Category</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants</td>
<td>I</td>
</tr>
<tr>
<td>Children</td>
<td>III</td>
</tr>
</tbody>
</table>

Justification

Weight for age is a sensitive indicator of acute nutritional inadequacy. The rate of gain during infancy, especially early infancy is rapid, and abnormalities in rate of weight gain may often be detected in just a few months. There is little question that decrease in the rate of weight gain during infancy is the earliest indication of nutritional failure. In contrast, children beyond infancy grow rather slowly, and many months of observation may be required to demonstrate that the rate of weight gain is unusually slow. During the first eighteen months of life, the rate of change in weight fluctuates and then declines rapidly. Because of this deceleration it may be difficult to differentiate normal growth slowing from an abnormal rate. After 18 months weight gain becomes more linear so assessment becomes easier.

Infants and children with abnormally slow growth can benefit from nutrition and health interventions to improve weight and height gain. The diagnosis of slow growth must consider possible causes of growth changes including undereating and disease conditions. Undereating, for any number of reasons, and disease conditions are the main causes of abnormally slow growth. Factors associated with undereating by an infant or child include inadequate sources of nutrient dense foods; lack of social support for the caregiver; an adverse social and psychological environment; a disorganized family; depressed parents or caregivers; and the caregiver’s lack of education, health and nutrition knowledge, mental and physical abilities, and responsibility for child care. There is good evidence that through nutrition education, supplemental foods, and referrals to other health and social services, participation in the WIC Program will benefit infants and children with slow growth. In keeping with the preventive nature of the WIC Program, a cut-off point approximating the 10th percentile rate of change in weight for age was chosen.

References


Attachment 135-A

Metric Equivalents for Average Weight Gain

Infants from birth to 6 months of age (Need 2 weights taken at least 1 month apart.)

<table>
<thead>
<tr>
<th>Age</th>
<th>Average Weight Gain (Metric equivalents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth - 1 mo</td>
<td>18 gm/day 126 gm/wk 0.54 kg/mo</td>
</tr>
<tr>
<td>1-2 mos</td>
<td>25 gm/day 175 gm/wk 0.75 kg/mo</td>
</tr>
<tr>
<td>2-3 mos</td>
<td>18 gm/day 126 gm/wk 0.54 kg/mo</td>
</tr>
<tr>
<td>3-4 mos</td>
<td>16 gm/day 112 gm/wk 0.48 kg/mo</td>
</tr>
<tr>
<td>4-5 mos</td>
<td>14 gm/day 98 gm/wk 0.42 kg/mo</td>
</tr>
<tr>
<td>5-6 mos</td>
<td>12 gm/day 84 gm/wk 0.36 kg/mo</td>
</tr>
</tbody>
</table>

Infants & Children from 6 months to 59 months of age (Need 2 weights taken at least 3 months apart.)

<table>
<thead>
<tr>
<th>Age</th>
<th>Average Weight Gain (Metric equivalents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - 12 mos</td>
<td>9 gm/day 63 gm/wk 0.27 kg/mo 1.62 kg/6 mos</td>
</tr>
<tr>
<td>12 - 59 mos</td>
<td>2 1/2 gm/day 17 1/2 gm/wk 0.08 kg/mo 0.45 kg/6 mos</td>
</tr>
</tbody>
</table>

Examples Using Calculated Expected Minimal Weight

General steps:

1. Determine if time interval between measures is sufficient.

2. Calculate actual weight gain.

3. Calculate expected minimal weight gain using the chart in the definition. (Note: Due to a variety of reasons, including rounding, different approaches to calculating the expected minimal weight gain may result in slightly different answers.)

4. Compare the actual weight gain with the calculated expected weight gain to see if person is eligible for WIC using this criterion.
Example #1

<table>
<thead>
<tr>
<th>Date of Measure</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/13/98 (birth)</td>
<td>7 pounds 6 oz</td>
</tr>
<tr>
<td>9/23/98 (10 days old)</td>
<td>8 pounds 1 oz</td>
</tr>
<tr>
<td>10/26/98 (6 weeks &amp; 1 day old)</td>
<td>9 pounds 3 oz</td>
</tr>
</tbody>
</table>

1. Interval between birth & 10/26/98 measures = 43 days.
2. Actual wt gain = 1 pound 13 oz.
3. Expected minimal weight gain is: \((540 \text{ gm}) + (13 \text{ days} \times 25 \text{ gm/day}) = 865 \text{ gms} = 30 \text{ oz} = 1 \text{ pound 15 oz}\).
4. Actual weight gain from birth is less than expected minimal weight gain → eligible for WIC using this criterion.

Example #2

<table>
<thead>
<tr>
<th>Date of Measure</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/27/00 (17 1/2 months old)</td>
<td>25 pounds</td>
</tr>
<tr>
<td>9/13/00 (24 months old)</td>
<td>26 1/2 pounds</td>
</tr>
</tbody>
</table>

1. Interval between two measures is 6 1/2 months.
2. Actual weight gain = 1 1/2 pound.
3. Expected minimal weight gain is: \((1 \text{ pound per 6 months}) + (0.5 \text{ mo} \times 2.7 \text{ oz/mo}) = 1 \text{ pound 1.35 oz}\).
4. Actual weight gain is MORE than expected weight gain :> NOT eligible for WIC using this criterion.

Attachment 135-B

Steps to calculate a low rate of weight gain when the 2 weight measurements are NOT within a 5½ - 6½ month interval

1. Use the two bullets below to determine if the two measurements were taken within an acceptable time interval for this risk to apply. If they do, proceed to step #2. If they do not, Option II CANNOT be used to determine eligibility for WIC.

- For Children >5 months through 17 months of age, the 2 measurements must be taken within a 5-7 month range (remember, for measurements taken within a 5½ - 6½ month interval, you do not need to proceed with steps 2-5, just use the chart to determine the applicability of the risk).
- For Children 18 months through <60 months of age, the 2 measurements must be taken within a 4-9 month interval (remember, for measurements taken within a 5½ - 6½ month interval, you do not need to proceed with steps 2-5, just use the chart to determine the applicability of the risk).
2. Plot both weights on an age and sex specific NCHS growth grid.

3. From the chart, choose the age from column 1 that most closely matches the child’s age when the second weight was taken and choose the weight gain from column 2 that corresponds with this age.

4. Add this weight gain figure to the first of the two weights and plot the sum of the weights on the growth grid at a point exactly 6 months from the date of the first weight.

5. Connect the point for the first weight with the point for the sum of the weights with a straight line (extend the line if there is a seven month interval between the two weights). If the point for the second weight is on or below the line then the child’s weight is inadequate.
359 Recent Major Surgery, Physical Trauma, Burns

Definition/Cut-off Value

Major surgery (including cesarean sections), physical trauma or burns severe enough to compromise nutritional status.

Any occurrence:
- Within the past two (≤2) months may be self-reported.
- More than two (>2) months previous must have the continued need for nutritional support diagnosed by a physician or a health care provider working under the orders of a physician.

Participant Category and Priority Level

<table>
<thead>
<tr>
<th>Category</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant Women</td>
<td>I</td>
</tr>
<tr>
<td>Breastfeeding Women</td>
<td>I</td>
</tr>
<tr>
<td>Non-Breastfeeding Women</td>
<td>III</td>
</tr>
<tr>
<td>Infants</td>
<td>I</td>
</tr>
<tr>
<td>Children</td>
<td>III</td>
</tr>
</tbody>
</table>

Justification

The body’s response to injuries such as major surgeries, physical trauma, or burn may adversely affect nutrient requirements needed for recovery, leading to malnutrition. The catabolic response to these injuries causes a hypermetabolic state in the body. This alteration in metabolism not only increases the individual’s calorie and protein needs, but they also increase the needs for certain vitamins, minerals, fatty acids, and amino acids. (1)

Proper wound healing is essential in the recovery of surgeries, physical trauma, and burns. Normal wound healing is a complex process and involves three phases: inflammation, proliferation, and remodeling (1, 2). Each phase of wound healing involves growth factors, other biologically active molecules, and specific vitamins and minerals such as Vitamin A, Vitamin C, and Zinc. The process of wound healing does not always follow the three stages sequentially and can sometimes move forward or regress based on nutrition status and response to treatment (3, 4). Even after a wound is closed, the individual’s metabolic rate and need for additional nutrition can remain high (5).

Factors that can prevent proper wound healing or can increase the time needed for a wound to heal include (2, 6):
- Malnutrition prior to the surgery, injury or burn
- Infections
- Diabetes
• Poor blood flow
• Obesity
• Age
• Heavy alcohol use
• Stress
• Medications
• Smoking

Because healing is a complex process and is impacted by a variety of factors, it is inappropriate to expect a set recovery time for an individual based solely on the type and severity of the injury (7). For some individuals, they may no longer be at increased nutritional risk within a couple weeks of their injury. For others, recovery from the same type and severity of injury may take months.

Major Surgery and Wound Healing

Many types of surgeries are completed as noninvasive procedures and do not result in large incisions that require additional medical and nutritional care to heal. However, many surgical procedures (including cesarean sections) do involve incisions that, if left unaddressed, could lead to infection. Major surgeries are surgeries that involve a risk to the life of the individual and include operations on organs within the body (8). Removal of a portion of the large or small intestine, heart surgery, and bariatric surgery are examples of major surgeries. Minor surgeries are surgeries that involve little risk to the individual and include operations on the superficial structures of the body (9). Ear tubes, the most common childhood surgery performed with anesthesia, are an example of a minor surgery that does not impact nutrition status (10).

Cesarean sections are considered a major surgery and, therefore, require additional assessment and education in the WIC clinic. In the US, the rate of cesarean delivery rose from 19.7% of singleton births in 1996 to 31.3% of singleton births in 2011 (11). Reasons for a cesarean delivery include: multiple pregnancy, labor fails to progress, medical concerns for the infant, problems with the placenta, a large infant, breech position, maternal infections, and medical conditions in the mother (i.e. diabetes or high blood pressure) (12).

Nutritional Considerations for Major Surgery/Wound Healing

The role of specific nutrients in wound healing continues to be explored and studies are conducted regularly to assess the role vitamins, minerals, fatty acids, amino acids, and carbohydrates play in proper wound healing. Nutrient supplements above the Recommended Dietary Allowance (RDA) may be necessary to aid in wound healing. However, before using any additional supplement to assist in wound healing, energy and protein requirements of the individual must be met (13, 14). Amino acids are essential to the repair of damaged tissue in the body. Amino acids are divided into three categories: essential (must be obtained through foods), nonessential (can be produced in the body), and conditionally essential (produced in the body except in cases of injury or illness). Arginine and Glutamine are examples of conditionally essential amino acids. The following table highlights the roles of these nutrients in the wound healing process:
Nutrient | Role in Wound Healing
--- | ---
Arginine | Involved in secretion of growth hormone (12)
Omega-3 fatty acids | Reduces wound infections (12)
Vitamin C | Collagen synthesis (2)
Vitamin A | Immune function and cellular communication (15)
Vitamin E | Antioxidant (16)
Vitamin D | Modulates cell growth
Neuromuscular and immune function
Reduces inflammation (17)
Magnesium | Co-factor for enzymes involved in protein and collagen synthesis (2)
Copper | Co-factor for cross-linking of collagen (2)
Zinc | Involved in RNA and DNA polymerase (2)
Iron | Aids in the synthesis of some growth hormones and connective tissue (18)

Following a cesarean section, a breastfeeding mother may experience difficulty finding a comfortable nursing position that does not cause pain with the incision. She may also have difficulty breastfeeding if the infant is drowsy due to the pain medication administered during the procedure. A referral to a lactation specialist can help ensure that the mother is successful in reaching her breastfeeding goals.

**Physical Trauma**

Physical trauma is usually a result of accidents and injuries that often lead to fractures, wounds, and subsequent hospitalization. Physical trauma can be divided into blunt force trauma, penetrating trauma, and trauma from surgery. Blunt force trauma is the result of an object (or force) striking the body, causing concussions, lacerations or fractures. Penetrating trauma is trauma that occurs as a result of an object piercing the skin, causing an open wound (7). Fracture healing is a process that begins with a hemorrhage and progresses through three stages: inflammatory, reparative, and remodeling.

Physical trauma can also be a result of domestic and/or child abuse. In addition to the physical effects of abuse, victims of abuse often experience acute and ongoing psychological and emotional trauma that may also impact an individual’s nutrition status. Poor appetite, undesirable food choices, and using food for coping can impact both women and children. Children may also begin hoarding food in cases of abuse or neglect. For more information on the impact of abuse, see Risk #901 *Recipient of Abuse.*

**Nutritional Considerations for Physical Trauma**

In addition to an increase in energy, protein, and micronutrients needed for proper wound healing, physical trauma that includes fractures requires additional nutrients for proper bone healing. In some cases, the physical trauma will lead to temporary or lifelong difficulty with self-feeding. Research on the roles specific nutrients play in fracture healing continues to expand. Key nutrients for bone health include calcium, phosphorus, fluoride, magnesium, sodium, vitamin D, vitamin A, vitamin K, vitamin C, vitamin B6, folate,
and vitamin B12. Meeting RDAs set for these nutrients is important for bone health and bone healing (19). For some individuals, intakes above the RDA may be recommended by their medical provider to assist in bone healing; however, some nutrients including fluoride, sodium, and vitamin A may negatively impact bone health when intake is above the recommended level (19).

Burns

Burns can be caused by heat (including hot surfaces, fires, and hot liquids), chemicals, electricity, sunlight or nuclear radiation. There are three stages of burns based on what layers of the skin are burned. A first-degree burn only affects the outer layer of the skin (epidermis). A second-degree burn damages the epidermis and the layer directly under the epidermis (dermis). A third-degree burn damages the epidermis, dermis, and damages the tissue underneath the skin. (20)

Burns are also classified based on the surface area of the body that has been burned (Percent Total Body Surface Area or TBSA). For example, a burn that covers one hand and arm would be 9% TBSA, whereas a burn that covers a person’s back would be 18% TBSA (21). Increases in the surface area affected by the burn result in a greater potential for fluid loss and infection (21). Inhalation burns are burns that occur inside an individual’s lungs and internal organs. Once discharged from the hospital, enteral feedings may be prescribed to aid in healing.

Nutritional Considerations for Burns

The nutrition status of burn patients is monitored very closely during hospitalization and after discharge. Following a severe burn, the body goes into a catabolic state and the body begins to breakdown skeletal muscle (5). This state increases the requirements for energy, protein, carbohydrates, fats, vitamins, minerals, and antioxidants (22). Damaged blood vessels also increase fluid loss and can lead to dehydration or shock (19). Nutrition care in the hospital setting for individual’s recovering from burns may also include parenteral or enteral nutrition support depending on the severity of the burns. Glutamine, a conditionally essential amino acid, can improve the healing of burns (23).

Implications for WIC Nutrition Services

Most surgeries, physical traumas, and burns are unexpected. The education and supplemental food that WIC provides can help ensure that the individual is in good nutritional health prior to the surgery, physical trauma or burn. Following a major surgery, physical trauma, and/or burn, an individual will be at increased nutritional risk until the injury has completely healed. WIC staff can improve outcomes following an injury by:

- Assuring that vitamin and mineral intakes meet the RDAs (unless amounts that exceed the RDAs are recommended by their medical provider).
- Assuring that energy and protein intake preserve lean muscle mass and body weight.
- Recommending a participant speak with their medical provider about a multivitamin supplement when diet alone cannot meet the RDAs for vitamins and minerals.
- Referring to community resources for smoking cessation, support groups, food assistance, and safe living environments (in cases of physical abuse).
- Referring to a lactation educator if women experience difficulty breastfeeding following a cesarean section.
References


19. Angelo G (Oregon State University, Linus Pauling Institute, Corvallis, OR). Micronutrient Information Center; 2012 Aug.


Additional Reference:

Guidelines

The intention of this risk code is to qualify a participant due to increased nutrient needs post-op.

Tubal ligation would qualify only if the standard incision procedure (one, large incision) was performed. The less invasive, laparoscopic tubal ligation procedure or other laparoscopic procedures (multiple, small incisions) are not considered invasive, major surgeries.
460 Inappropriate Nutrition Practices for Infants

Definition/cut-off value
Routine use of feeding practices that may result in impaired nutrient status, disease, or health problems. These practices, with examples, are outlined below. Refer to “Attachment to 460-Justification and References” for this criterion.

Participant category and priority level

<table>
<thead>
<tr>
<th>Category</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants</td>
<td>IV</td>
</tr>
</tbody>
</table>

**Inappropriate Nutrition Practices for Infants**

<table>
<thead>
<tr>
<th>Practice Description</th>
<th>Examples of substitutes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>460.1 Routinely using a substitute(s) for human milk or for FDA approved iron-fortified formula as the primary nutrient source during the first year of life.</td>
<td>• Low iron formula without iron supplementation;</td>
</tr>
<tr>
<td></td>
<td>• Cow’s milk, goat’s milk, or sheep’s milk (whole, reduced fat, low-fat, skim), canned evaporated or sweetened condensed milk; and</td>
</tr>
<tr>
<td></td>
<td>• Imitation or substitute milks (such as rice- or soy-based beverages, non-dairy creamer), or other “homemade concoctions.”</td>
</tr>
<tr>
<td>460.2 Routinely using nursing bottles or cups improperly</td>
<td>• Using a bottle to feed fruit juice.</td>
</tr>
<tr>
<td></td>
<td>• Feeding any sugar-containing fluids, such as soda/soft drinks, gelatin water, corn syrup solutions, and sweetened tea.</td>
</tr>
<tr>
<td></td>
<td>• Allowing the infant to fall asleep or be put to bed with a bottle at naps or bedtime.</td>
</tr>
<tr>
<td></td>
<td>• Allowing the infant to use the bottle without restriction (e.g., walking around with a bottle) or as a pacifier.</td>
</tr>
<tr>
<td></td>
<td>• Propping the bottle when feeding.</td>
</tr>
<tr>
<td></td>
<td>• Allowing an infant to carry around and drink throughout the day from a covered or training cup.</td>
</tr>
<tr>
<td></td>
<td>• Adding any food (cereal or other solid foods) to the infant’s bottle.</td>
</tr>
<tr>
<td>Inappropriate Nutrition Practices for Infants</td>
<td>Examples of Inappropriate Nutrition Practices (including but not limited to)</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 460.3 Routinely offering complementary foods* or other substances that are inappropriate in type or timing. *Complementary foods are any foods or beverages other than human milk or infant formula. | Examples of inappropriate complementary foods:  
- Adding sweet agents such as sugar, honey, or syrups to any beverage (including water) or prepared food, or used on a pacifier; and  
- Introducing any food other than human milk or iron-fortified infant formula before 6 months of age. |
| 460.4 Routinely using feeding practices that disregard the developmental needs or stage of the infant. | Inability to recognize, insensitivity to, or disregarding the infant’s cues for hunger and satiety (e.g., forcing an infant to eat a certain type and/or amount of food or beverage or ignoring an infant’s hunger cues).  
- Feeding foods of inappropriate consistency, size, or shape that put infants at risk of choking.  
- Not supporting an infant’s need for growing independence with self-feeding (e.g., solely spoon-feeding an infant who is able and ready to finger-feed and/or try self-feeding with appropriate utensils).  
- Feeding an infant food with inappropriate textures based on his/her developmental stage (e.g., feeding primarily pureed or liquid foods when the infant is ready and capable of eating mashed, chopped or appropriate finger foods). |
| 460.5 Feeding foods to an infant that could be contaminated with harmful microorganisms or toxins. | Examples of potentially harmful foods:  
- Unpasteurized fruit or vegetable juice;  
- Unpasteurized dairy products or soft cheeses such as feta, Brie, Camembert, blue-veined, and Mexican-style cheese;  
- Honey (added to liquids or solid foods, used in cooking, as part of processed foods, on a pacifier, etc.);  
- Raw or undercooked meat, fish, poultry, or eggs;  
- Raw vegetable sprouts (alfalfa, clover, bean, and radish); and  
- Deli meats, hot dogs, and processed meats (avoid unless heated until steaming hot). |
| 460.6 Routinely feeding inappropriately diluted formula. | Failure to follow manufacturer’s dilution instructions (to include stretching formula for household economic reasons).  
- Failure to follow specific instructions accompanying a prescription. |
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| 460.7 Routinely limiting the frequency of nursing of the exclusively breastfed infant when human milk is the sole source of nutrients. | Examples of inappropriate frequency of nursing:  
  - Scheduled feedings instead of demand feedings; and  
  - Less than 8 feedings in 24 hours if less than 2 months of age. |
| 460.8 Routinely feeding a diet very low in calories and/or essential nutrients. | Examples:  
  - Strict vegan diet;  
  - Macrobiotic diet; and  
  - Other diets very low in calories and/or essential nutrients. |
| 460.9 Routinely using inappropriate sanitation in preparation, handling, and storage of expressed human milk or formula. | Limited or no access to a:  
  - Safe water supply (documented by appropriate officials e.g., municipal or health department authorities);  
  - Heat source for sterilization; and/or  
  - Refrigerator or freezer for storage.  
Failure to prepare, handle, and store bottles, storage containers or breast pumps properly; examples include:  
Human Milk  
  - Thawing/heating in a microwave  
  - Refreezing  
  - Adding freshly expressed unrefrigerated human milk to frozen human milk  
  - Adding freshly pumped chilled human milk to frozen human milk in an amount that is greater than the amount of frozen human milk  
  - Feeding thawed refrigerated human milk more than 24 hours after it was thawed  
  - Saving human milk from a used bottle for another feeding  
  - Failure to clean breast pump per manufacturer’s instruction  
Formula  
  - Failure to prepare and/or store formula per manufacturer’s or physician instructions  
  - Storing at room temperature for more than 1 hour  
  - Using formula in a bottle one hour after the start of a feeding |
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<td>460.10 Feeding dietary supplements with potentially harmful consequences.</td>
<td>Examples of dietary supplements which, when fed in excess of recommended dosage, may be toxic or have harmful consequences:</td>
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<td>• Herbal or botanical supplements/remedies/teas.</td>
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<td>460.11 Routinely not providing dietary supplements recognized as essential by national public health policy when an infant’s diet alone cannot meet nutrient requirements.</td>
<td>• Infants who are 6 months of age or older who are ingesting less than 0.25 mg of fluoride daily when the water supply contains less than 0.3 ppm fluoride.</td>
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<td>• Infants who are exclusively breastfed, or who are ingesting less than 1 liter (or 1 quart) per day of vitamin D-fortified formula, and are not taking a supplement of 400 IU of vitamin D.</td>
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Inappropriate Nutrition Practices for Infants

Justification

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

During the first year of life, breastfeeding is the normative standard method of infant feeding. The American Academy of Pediatrics (AAP) recommends human milk for the first 12 months of life because of its acknowledged benefits to infant nutrition, gastrointestinal function, host defense, and psychological well-being (1). In addition, the AAP has established exclusive breastfeeding as the standard against which all alternative feeding methods must be measured with regard to growth, health, development, and all other short and long-term outcomes for children (2). For infants fed infant formula, iron-fortified formula is generally recommended as a substitute for breastfeeding (1-5). Rapid growth and increased physical activity significantly increase the need for iron and utilize iron stores (1). Body stores are insufficient to meet the increased iron needs making it necessary for the infant to receive a dependable source of iron to prevent iron deficiency anemia (1). Iron deficiency anemia is associated with cognitive and psychomotor impairments that may be irreversible, and with decreased immune function, apathy, short attention span, and irritability (1, 6). Feeding of low-iron infant formula can compromise an infant’s iron stores and lead to iron deficiency anemia. Cow’s milk has insufficient and inappropriate amounts of nutrients and can cause occult blood loss that can lead to iron deficiency, stress on the kidneys from a high renal solute load, and allergic reactions (1, 4, 6-9). Sweetened condensed milk has an abundance of sugar that displaces other nutrients or causes over-consumption of calories (10). Homemade formulas prepared with canned evaporated milk do not contain optimal kinds and amounts of nutrients infants need (1, 6, 9, 10). Goat’s milk, sheep’s milk, imitation milks, and substitute milks do not contain nutrients in amounts appropriate for infants (1, 4, 6, 11, 12).

460.2 Routinely using nursing bottles or cups improperly.

Dental caries is a major health problem in U.S. preschool children, especially in low-income populations (13). Eating and feeding habits that affect tooth decay and are started during infancy may continue into early childhood. Most implicated in this disease process is prolonged use of baby bottles during the day or night, containing fermentable sugars, (e.g., fruit juice, soda, and other sweetened drinks), pacifiers dipped in sweet agents such as sugar, honey or syrups, or other high frequency sugar exposures (14). The AAP and the American Academy of Pedodontics recommend that juice should be offered to infants (>6 months of age) in a cup, not a bottle, and that infants not be put to bed with a bottle in their mouths (15, 16). While sleeping with a bottle in his or her mouth, an infant’s swallowing and salivary flow decreases, thus creating a pooling of liquid around the teeth (17). The practice of allowing infants to carry or drink from a bottle or training cup of juice for periods throughout the day leads to excessive exposure of the teeth to fermentable carbohydrates, which promotes the development of dental caries (15).

Allowing infants to sleep with a nursing bottle containing fermentable carbohydrates or to use it unsupervised during waking hours provides an almost constant supply of carbohydrates and sugars (1). This leads to rapid demineralization of tooth enamel and an increase in the risk of dental caries due to prolonged contact between cariogenic bacteria on the susceptible tooth surface and the sugars in the
consumed liquid (1, 18). The sugars in the liquid pool around the infant’s teeth and gums, feed the bacteria there, and decay is the result (19). The process may start before the teeth are even fully erupted. Upper incisors (upper front teeth) are particularly vulnerable; the lower incisors are generally protected by the tongue (19). The damage begins as white lesions and progresses to brown or black discoloration typical of caries (19). When early childhood caries is severe, the decayed crowns may break off and the permanent teeth developing below may be damaged (19). Undiagnosed dental caries and other oral pain may contribute to feeding problems and failure to thrive in young children (19).

Unrestricted use of a bottle containing fermentable carbohydrates is a risk because the more times an infant consumes solid or liquid food, the higher the caries risk (1). Feeding behaviors such as unrestricted use of the bottle and frequent snacking can be habit forming in later infancy and may carry over into toddlerhood. Frequent cariogenic snacks eaten between meals place the toddler at high risk for caries development; this includes the habit of continually sipping from cups (or bottles) containing cariogenic liquids (juice, milk, soda, or sweetened liquid) (19). If inappropriate use of the bottle persists, the child is at risk of toothaches, costly dental treatment, loss of primary teeth, and developmental lags on eating and chewing. If this continues beyond the usual weaning period, there is a risk of decay to permanent teeth.

Propping the bottle deprives infants of vital human contact and nurturing which makes them feel secure. It can also cause ear infections because of fluid entering the middle ear and not draining properly; choking from liquid flowing into the lungs; and tooth decay from prolonged exposure to carbohydrate-containing liquids (20).

Adding solid food to a nursing bottle results in force-feeding, inappropriately increases the energy and nutrient composition of the formula, deprives the infant of experiences important in the development of feeding behavior, and could cause an infant to choke (1, 11, 21, 22).

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

Infants, especially those living in poverty, are at high risk for developing early childhood caries (13). Most implicated in this disease process are: prolonged use of baby bottles containing fermentable sugars, (e.g., fruit juice, soda, and other sweetened drinks) during the day or night; pacifiers dipped in sweet agents such as sugar, honey or syrups; or other high frequency sugar exposures (14).

The AAP recommends exclusive breastfeeding through 6 months of age (1). Feeding solid foods too early (i.e., before 6 months of age) by, for example, adding diluted cereal or other solid foods to bottles deprives infants of the opportunity to learn to feed themselves (4, 11, 23). The major objection to the introduction of solids before 6 months of age is based on the possibility that it may interfere with establishing sound eating habits and may contribute to overfeeding (6, 24). In early infancy, the infant possesses an extrusion reflex that enables him/her to swallow only liquid foods (1, 13, 25). The extrusion reflex is normally diminished by 6 months of age (1). Breast milk or iron-fortified infant formula is all the infant needs. Gastric secretions, digestive capacity, renal capacity and enzymatic secretions are low, which makes digestion of solids inefficient and potentially harmful (6, 24, 25). Furthermore, there is the potential for antigens to be developed against solid foods, due to the undigested proteins that may permeate the gut; however, the potential for developing allergic reactions may primarily be in infants with a strong family history of atopy (6, 24). If solid foods are introduced before the infant is developmentally ready, breast milk or iron-fortified formula necessary for optimum growth is displaced (1, 25). Around 6 months of age, the infant is developmentally ready for solid foods when: the infant is better able to express certain feeding
cues such as turning head to indicate satiation; oral and gross motor skills begin to develop that help the infant to take solid foods; the extrusion reflex disappears; and the infant begins to sit upright and maintain balance with little or no support (1, 6, 24, 25).

The AAP advises against giving fruit juice to infants younger than 6 months since it offers no nutritional benefit at this age (1). Offering juice before solid foods are introduced into the diet could risk having juice replace breast milk or infant formula in the diet (15). This can result in reduced intake of protein, fat, vitamins, and minerals such as iron, calcium, and zinc (26). It is prudent to give juice only to infants who can drink from a cup (15).

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

Infants held to rigid feeding schedules are often underfed or overfed. Caregivers insensitive to signs of hunger and satiety, or who over-manage feeding may inappropriately restrict or encourage excessive intake. Findings show that these practices may promote negative or unpleasant associations with eating that may continue into later life, and may also contribute to obesity. Infrequent breastfeeding can result in lactation insufficiency and infant failure-to-thrive. Infants should be fed foods with a texture appropriate to their developmental level. (4, 6, 11, 13, 23)

**460.5 Feeding foods to an infant that could be contaminated with harmful microorganisms or toxins.** Only pasteurized juice is safe for infants, children, and adolescents (15). Pasteurized fruit juices are free of microorganisms (15). Unpasteurized juice may contain pathogens, such as Escherichia coli, Salmonella, and Cryptosporidium organisms (15, 27). These organisms can cause serious disease, such as hemolytic-uremic syndrome, and should never be fed to infants and children (15). Unpasteurized juice must contain a warning on the label that the product may contain harmful bacteria (15, 28). Infants or young children should not eat raw or unpasteurized milk or cheeses (1)—unpasteurized dairy products could contain harmful bacteria, such as Brucella species, that could cause young children to contract a dangerous food borne illness. The AAP also recommends that young children should not eat soft cheeses such as feta, Brie, Camembert, blue-veined, and Mexican-style cheese—these foods could contain Listeria bacteria (1). Hard cheeses, processed cheeses, cream cheese, cottage cheese, and yogurt need not be avoided (1).

Honey has been implicated as the primary food source of *Clostridium botulinum* during infancy. These spores are extremely resistant to heat, including pasteurization, and are not destroyed by present methods of processing honey. Botulism in infancy is caused by ingestion of the spores, which germinate into the toxin in the lumen of the bowel (10, 11, 29, 30).

Infants or young children should not eat raw or undercooked meat or poultry, raw fish or shellfish, including oysters, clams, mussels, and scallops —these foods may contain harmful bacteria or parasites that could cause children to contract a dangerous food-borne illness (1).

According to the AAP, to prevent food-borne illness, the foods listed below should not be fed to infants or young children (1). All of the foods have been implicated in selected outbreaks of food-borne illness, including in children. Background information regarding foods that could be contaminated with harmful microorganisms is also included below (1):

- Raw vegetable sprouts (alfalfa, clover, bean, and radish) -- can cause potentially dangerous Salmonella and E. coli O157 infection. Sprouts grown under clean conditions in the home also present a risk because bacteria may be present in the seeds. Cook sprouts to reduce the risk of illness significantly (31).
• Deli meats, hot dogs, and processed meats (avoid unless heated until steaming hot) -- These foods have been found to be contaminated with Listeria monocytogenes; if adequately cooked, this bacteria is destroyed.

460.6 Routinely feeding inappropriately diluted formula.

Over-dilution can result in water intoxication resulting in hyponatremia; irritability; coma; inadequate nutrient intake; failure to thrive; and/or poor growth (1, 4, 6, 11, 32). Underdilution of formula increases calories, protein, and solutes presented to the kidney for excretion, and can result in hypernatremia, tetany, and obesity (4, 6, 11, 32).

Dehydration and metabolic acidosis can occur with under-dilution of formula (4, 6, 11, 32). Powdered formulas vary in density so manufacturers’ scoops are formula-specific to assure correct dilution (6). One clue for staff to identify incorrect formula preparation is to determine if the parent/caregiver is using the correct manufacturer’s scoop to prepare the formula.

460.7 Routinely limiting the frequency of nursing of the exclusively breastfed infant when human milk is the sole source of nutrients.

Exclusive breastfeeding provides ideal nutrition to an infant and is sufficient to support optimal growth and development in the first 6 months of life (5). Human colostrum and milk have been studied extensively. They are composed of a mixture of nutritive components and other bioactive factors that are easy to digest and absorb and have strong physiologic effects upon the infant, and their composition changes over time to meet the infant’s changing nutritional needs (1).

Frequent breastfeeding is critical to the establishment and maintenance of an adequate milk supply for the infant (5, 33-37). Inadequate frequency of breastfeeding may lead to lactation failure in the mother and dehydration, poor weight gain, diarrhea, vomiting, illness, and malnourishment in the infant (5, 35, 38-43). Exclusive breastfeeding protects infants from early exposure to contaminated foods and liquids (41). Infants who receive human milk more than infant formulas have a lower risk of being overweight in childhood and adolescence (44, 45). In addition, a summary report of several primary studies and meta-analyses has reported that a history of breastfeeding is associated with a reduction in the risk of otitis media, gastroenteritis, hospitalization for lower respiratory tract infections, atopic dermatitis, sudden infant death syndrome, childhood asthma, childhood leukemia, and type 1 and 2 diabetes (46).

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

Highly restrictive diets prevent adequate intake of nutrients, interfere with growth and development, and may lead to other adverse physiological effects (4). Infants older than 6 months are potentially at the greatest risk for overt deficiency states related to inappropriate restrictions of the diet, although deficiencies of vitamins B12 and essential fatty acids may appear earlier (1, 47, 48). Infants are particularly vulnerable during the weaning period if fed a macrobiotic diet and may experience psychomotor delay in some instances (1, 49, 50). Well-balanced vegetarian diets with dairy products and eggs are generally associated with good health. However, strict vegan diets may be inadequate in calories, vitamin B12, vitamin D, calcium, iron, protein and essential amino acids needed for growth and development (51). The more limited the diet, the greater the health risk. Given the health and nutrition risks associated with highly restrictive diets, WIC can help the parent to assure that the infant consumes an adequate diet to optimize health during critical periods of growth as well as for the long term.
460.9 Routinely using inappropriate sanitation in preparation, handling, and storage of expressed human milk or formula.

Lack of sanitation in the preparation, handling and storage of expressed human milk or formula may cause gastrointestinal infection. The water used to prepare concentrated or powdered infant formula and prepare bottles and nipples (for formula and human milk) must be safe for consumption. Water contaminated with toxic substances (such as nitrates, lead, or pesticides) poses a hazard to an infant’s health and should NOT be used (10). In addition, a heat source is necessary to sterilize bottles and other items used in the storage of both human milk and formula. Adequate refrigeration (40 Degrees Fahrenheit or below) is necessary to safely store human milk and prepared formula (10).

**Human Milk**

Published guidelines on the handling and storage of human milk may differ among pediatric nutrition authorities (1, 10, 52-55). However, there is consensus on the following human milk feeding, handling, and storage practices that are considered inappropriate and unsafe (10, 52, 56-58):

- Thawing frozen human milk in the microwave oven
- Refreezing human milk
- Adding freshly expressed unrefrigerated human milk to already frozen milk in a storage container
- Feeding previously frozen human milk thawed in the refrigerator that has been refrigerated for more than 24 hours
- Saving human milk from a used bottle for use at a subsequent feeding
- Failure to clean a breast pump per manufacturer’s instruction

Another consideration when recommending length of storage time is its effect on protective properties in human milk. There is evidence that after 48 hours of refrigeration, human milk significantly loses important antibacterial and antioxidant properties (59). These properties of human milk are specifically important for the prevention of necrotizing enterocolitis, retinopathy, and bronchopulmonary dysplasia of premature infants (5). Although some properties may be reduced with longer refrigerated storage, this does not diminish the overall superiority of human milk over formula, as formula does not contain these protective properties or many of the other benefits of human milk.

Participant circumstances (e.g., adequate refrigeration, safe water, heat source), the health of the infant and health care provider directions need to be considered when recommending the length of time human milk should be stored.

If the breastfeeding mother uses a breast pump, it is essential for her to fully understand the importance of the specific manufacturer’s instructions for cleaning the breast pump. Improper cleaning of breast pumps and pump parts can increase the risk of expressed human milk contamination (58).

**Formula**

Formula must be properly prepared in a sanitary manner to be safe for consumption. Furthermore, prepared infant formula is a perishable food, and must be handled and stored properly in order to be safe for consumption (4, 10).
Most babies who are hospitalized for vomiting and diarrhea are bottle fed. This has often been attributed to the improper handling of formula rather than sensitivities to the formula. In rare cases, the contaminated powdered formulas may cause infections in preterm or immune compromised infants. To reduce the risk of infection in infants it is important that formulas be carefully prepared and handled. All formula should be prepared according to the manufacturer’s instruction on the label, or those given by the health care provider.

Manufacturers’ instructions vary, depending on the product, in the length of time it is considered safe to store prepared infant formula without refrigeration before bacterial growth accelerates to an extent that the infant is placed at risk (1). Published guidelines on the handling and storage of infant formula indicate that it is unsafe to use prepared formula which (1):

- Has been held at room temperature longer than 1 hour or longer than recommended by the manufacturer
- Has been held in the refrigerator longer than the safe storage time indicated by the manufacturer
- Remains in a bottle one hour after the start of feeding
- Remains in a bottle from an earlier feeding
- Is fed using improperly cleaned baby bottles

460.10 Feeding dietary supplements with potentially harmful consequences.

An infant consuming inappropriate or excessive amounts of single or multivitamin or mineral or herbal remedy not prescribed by a physician is at risk for a variety of adverse effects including harmful nutrient interactions, toxicity, and teratogenicity (1, 60). While some herbal teas may be safe, some have undesirable effects, particularly on infants who are fed herbal teas or who receive breast milk from mothers who have ingested herbal teas (61). Examples of teas with potentially harmful effects to infants and children include: licorice, comfrey leaves, sassafras, senna, buckhorn bark, cinnamon, wormwood, woodruff, valerian, foxglove, pokeroor or pokeweed, periwinkle, nutmeg, catnip, hydrangea, juniper, Mormon tea, thorn apple, yohimbe bark, lobelia, oleander, maté, kola nut or gotu cola, and chamomile (61-63). Like drugs, herbal or botanical preparations have chemical and biological activity, may have side effects, and may interact with certain medications—these interactions can cause problems and can even be dangerous (64). Botanical supplements are not necessarily safe because the safety of a botanical depends on many things, such as its chemical makeup, how it works in the body, how it is prepared, and the dose used (64).

460.11 Routinely not providing dietary supplements recognized as essential by national public health policy when an infant’s diet alone cannot meet nutrient requirements.

Depending on an infant’s specific needs and environmental circumstances, certain dietary supplements may be recommended by the infant’s health care provider to ensure health. For example, fluoride supplements may be of benefit in reducing dental decay for children living in fluoride-deficient areas (1, 65).

To prevent rickets and vitamin D deficiency in healthy infants and children, the AAP recommends a supplement of 400 IU per day for the following (5,66):

- All breastfed and partially breastfed infants unless they are weaned to at least 1 liter (or 1 quart) per day of vitamin D-fortified formula.
• All non-breastfed infants who are ingesting less than 1 liter (or 1 quart) per day of vitamin D-fortified formula.

References


Guidelines

If an infant is consuming less than 1 quart (32 ounces) of fortified vitamin D-fortified formula per day, refer to healthcare provider. Encourage parent/guardian to speak to the healthcare provider about vitamin D supplementation.