Keeping Introductory Foods Complementary
Title of Activity:  ___ Keeping Introductory Foods Complementary  

Identified Gap(s): __ Lack of knowledge of appropriate foods, appropriate age of introduction, and risks associated with early introduction of foods

Description of current state:  Suggesting introduction of foods prematurely, suggesting too large volume of foods, inconsistent information.

Description of desired/achievable state: Evidence-based practice regarding introduction of foods for a breastfed baby.

Gap to be addressed by this activity:

X Knowledge   _____ Skills   X Practice   _____ Other: Describe Evidence-based resources

**Purpose:** The purpose of this activity is to enable the learner to use evidence-based knowledge to encourage appropriate introduction of complementary solid foods to the breastfed infant’s diet when developmentally ready until natural weaning occurs, perhaps years later.

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>CONTENT (Topics)</th>
<th>TIME FRAME</th>
<th>PRESENTER</th>
<th>TEACHING METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>List learner’s objectives in behavioral terms</td>
<td>Provide an outline of the content for each objective. It must be more than a restatement of the objective.</td>
<td>State the time frame for each objective</td>
<td>List the Faculty for each objective.</td>
<td>Describe the teaching methods, strategies, materials &amp; resources for each objective</td>
</tr>
<tr>
<td>1. explain the rationale for current infant feeding recommendations with regard to the introduction of solid food.</td>
<td>What is complementary feeding? A. Historical perspective B. Health organizations’ recommendations for introduction of solids C. Complementary foods vs weaning D. Rationale for solids at 6 months of age. E. Nutrition contribution of breast milk in diet of older infant and young child F. Developmental readiness G. Risks of early introduction of solids H. Risks of late introduction of solids</td>
<td>20 minutes</td>
<td>Donna W. Logan, RD, LD, IBCLC, RLC</td>
<td>Lecture based on current evidence found in peer-reviewed journals.</td>
</tr>
<tr>
<td>2. describe the current practice of introduction of solid foods to infants</td>
<td>A. Why solids are started early B. Counseling: talk about risks or benefits? C. Appropriate complementary foods D. Common misconceptions</td>
<td>20 minutes</td>
<td>Donna W. Logan, RD, LD, IBCLC, RLC</td>
<td>Lecture based on current evidence found in peer-reviewed journals.</td>
</tr>
<tr>
<td>3. compare the introduction of complementary foods between</td>
<td>A. Exposure to flavors B. Hunger/fullness cues C. Decreased autoimmune diseases</td>
<td>20 minutes</td>
<td>Donna W. Logan, RD, LD, IBCLC, RLC</td>
<td>Lecture based on current evidence found in peer-reviewed journals.</td>
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breastfed infants and those fed artificial milks

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<tbody>
<tr>
<td>D.</td>
<td>Decreased allergies</td>
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<tr>
<td>E.</td>
<td>Other long-term health outcomes</td>
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</table>

List the evidence-based references used for developing this educational activity:


<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title and Source</th>
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</thead>
<tbody>
<tr>
<td>Leo, S., Dean, J. &amp; Chan, E.S. (2012).</td>
<td>What are the beliefs of pediatricians and dietitians regarding complementary food introduction to prevent allergy? <em>Allergy, Asthma &amp; Clinical Immunology</em> 8, 3.</td>
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difficulties at 6 and 15 months. *Journal of Human Nutrition and Dietetics* 14(1), 43-54.

<table>
<thead>
<tr>
<th>Total Minutes</th>
<th>divided by 60</th>
<th>=</th>
<th>contact hour(s)</th>
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<td>60</td>
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<td>1</td>
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</table>

1/21/2014

Completed By: Name and Credentials

Date

Rev. 06/12/12

Approved Provider Educational Planning Table 2013 - Live

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Slide 1

Keeping Introductory Foods COMPLEMENTARY
Donna W. Logan, RD, LD, IBCLC, RLC
UT Health Science Center Houston, Texas

Slide 2

Goals for this session
- Explain rationale for introduction of solids at 6 months of age.
- Compare the current practice of introduction of solid food to recommendations.
- Compare the transition to solid foods between infants fed breast milk and those fed artificial baby milks.

Slide 3

Limits: Healthy Term Infants
- Outside the scope of this talk
  - Premature
  - Failure to thrive
  - Developmentally delayed
  - Having medical conditions affecting nutrient needs, growth and/or development
Slide 4

What is "Complementary Feeding"?

- "The transition from exclusive breastfeeding to family foods" (WHO).
- The term 'complementary' is preferable to 'weaning'
  - Intended to contribute nutrients once breast milk alone is insufficient
  - First foods should complement breast milk, not replace it

Slide 5

How do we define "weaning"?

- To begin solid foods
- To decrease dependence by cutting down little by little
- To no longer take mother's milk

Slide 6

"Weaning": What does it mean to moms?

- "to accustom a child to take food other than by nursing"
- "to detach from (gradually)"
- "to end breastfeeding"
**Slide 7**

Consider the Historical Perspective

"to accustom a child to take food other than by nursing"

**Slide 8**

Complementary Feeding

<table>
<thead>
<tr>
<th>Organization</th>
<th>Duration of Exclusive BF</th>
<th>How long to BF?</th>
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<tbody>
<tr>
<td>WHO</td>
<td>6 months</td>
<td>2 years and beyond</td>
</tr>
<tr>
<td>AAP</td>
<td>6 months</td>
<td>Continue 1 year and as long as both mother/child wish</td>
</tr>
<tr>
<td>AAFP</td>
<td>About 6 months</td>
<td>Continue 1 year or as long as mutually desired</td>
</tr>
<tr>
<td>ACOG</td>
<td>About 6 months</td>
<td>As long as possible</td>
</tr>
<tr>
<td>AND</td>
<td>6 months</td>
<td>At least 12 months</td>
</tr>
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</table>

**Slide 9**

The Weaning Process

- It's a process, not an one-day event. But HOW LONG??
- Begins when a baby takes any food other than mother's milk
- Ends with the last breastfeeding
Slide 10

Why Wait until 6 Months?

- Tongue-thrust reflex fades
- Can transfer non-liquid food from spoon to back of mouth using tongue
- Baby can sit up and lean forward
- Can reach for food and open mouth when hungry

(Samour & King, 2012)

Slide 11

Why Wait until 6 Months?

- Can turn away from food when full
- Improved renal function
- Maturing Immune system
- Gap junctions in GI system closed

(Samour & King, 2012)

Slide 12

Why Continue Giving Breastmilk?

- Breast milk continues to provide substantial amounts of key nutrients during the second half of the first year and well into the second year
- Continued benefits to mom and infant

(Dewey, 2001)
Why Continue Giving Breastmilk?

- Complementary foods (CFs), no matter how nutritious, can't replace breast milk.
- CFs can provide important nutrients, but only breast milk contains antibodies (Dewey, 2001).

Breastfeeding and Infant Feeding

- BF Mothers Compared to ABM:
  - Introduce solid foods at later age
  - More likely to follow recommended guidelines
  - Offer more nutrient-dense foods
  - Respond better to infant and child hunger and fullness cues
  - Less force-feeding / over-feeding (Robinson & Fall, 2012)

  - Breastfeeding allows infants to self-regulate food intake
  - Teaches both moms and infants to follow hunger and fullness cues
  - Transfer of child-led feeding skills to complementary feeding
  - Length of BF positively associated with degree of satiety responsiveness
Slide 16

**Complementary Feeding Health Outcomes**

- Time of complementary feeding is when the child is most nutritionally vulnerable
- ~50% of all childhood mortality directly or indirectly related to malnutrition

(Krebs & Hambidge 2007)

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Slide 17

**Relative Contribution to Nutrient Intake of Breast Milk and Complementary Foods**

<table>
<thead>
<tr>
<th>Time</th>
<th>% from CF</th>
<th>% from BM</th>
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<tr>
<td>6-8 mo</td>
<td>100</td>
<td>0</td>
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<tr>
<td>9-11 mo</td>
<td>50</td>
<td>50</td>
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<tr>
<td>12-23 mo</td>
<td>25</td>
<td>75</td>
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</tbody>
</table>

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Slide 18

**Relative Contribution to Nutrient Intake of Breast Milk and Complementary Foods**

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<th>Time</th>
<th>% from CF</th>
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</tr>
</tbody>
</table>
Relative Contribution to Nutrient Intake of Breast Milk and Complementary Foods

6-8 mo 9-11 mo 12-23 mo

% from CF % from BM

Complementary Feeding Outcomes

- Depends on quality of complementary foods
- Should contribute needed nutrients
  - Vitamin D
  - Iron
  - Zinc
  - Calcium

(Przyrembel, 2012)
Slide 22

- Has immediate and later health consequences for mother and child
- Influenced by whether infant is breastfed or ABM-fed (Przyrembel, 2012)

Slide 23

- Ideal time 6-7 months of age
- Risks associated with introducing solids sooner
- Risks associated with introducing solids later

Slide 24

- Greater risk of GI infections and diarrhea for infants (Kramer, 2003)
- Increased risk of allergy (Muraro et al., 2004)
- Increased risk for delayed motor development (Dewey et al., 2001)
Slide 25

- Increased risk of celiac disease (Norris et al, 2005)
- Increased risk of Type I Diabetes (Norris et al, 2003)
- Increased risk of later obesity (Huh, 2011)

Slide 26

- Risk of decreased weight, length, and HC compared to those exclusively BF (Kramer et al, 2004)
- Increased risk of respiratory illness (Forsyth, 2001)

Slide 27

- Associated with later unhealthy feeding practices
- Associated with increased consumption of fatty and sugary foods (Grummer-Strawn et al, 2008)
Slide 28

- Increased risk for iron deficiency (Dewey et al. 2001)
- Lose less weight (Olson et al. 2001)
- Return to fertility sooner (Panzetta, 2011)

Not Too Early! Risks for Mom

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Slide 29

- Less educated
- Younger age
- Lower SES
- Smoker
- No BF or only for a short time
- Limited access to healthcare (Przyrembel, 2012)

Moms who Start Solids “Too Early”

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Slide 30

- Once started, solid foods must be continued (Heinig et al., 2006)
- Solid foods is an “achievement” or sign of maturity (Anderson et al. 2001)
- Solid foods will reduce crying (Crocetti et al. 2004)
- Babies who eat solids will sleep through the night (Crocetti et al. 2004)

Maternal Misperceptions

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Slide 31

“Good Reasons to Wait® Not Good Enough

Research indicates that explaining the risks of early introduction of solids to mothers is more effective in achieving compliance to feeding recommendations than solely explaining the benefits of waiting until 6 months of age.

(Reprinted from Horodynski et al 2007)

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But Not Too Late! Risks for Baby

Increased Risk of Allergies
--Children who started wheat cereal after 7 months were four times more likely to develop a wheat allergy than those exposed earlier. (Poole et al 2006)

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But Not Too Late! Risks for Baby

Increased Risk of Celiac Disease
--Swedish health authorities recommended delay of gluten exposure until after 7 months to decrease risk of celiac disease.
--Result: Four-fold increase
--Reversal of recommendation resulted in decline back to previous levels. (Ivarsson et al 2000)
Slide 34

- **Increased Risk of Type 1 Diabetes**
  - When babies at risk for Type 1 DM started gluten foods after 7 months, auto-antibodies associated with DM increased (Norris et al. 2003).
  - Breastfeeding infants had a decreased risk of developing auto-antibodies when exposed to gluten foods, regardless of age at exposure (Norris et al. 2003).  

**But Not Too Late! Risks for Baby**

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- **Decreased Acceptance of Foods**
  - More food refusal and dislikes
  - Less variety
  - Introduction of lumpy food after 9 months of age increases likelihood of being described as a “picky eater” at both 15 months and 7 years of age (Northstone et al. 2001).

**But Not Too Late! Risks for Baby**

Slide 36

- **Risk of Growth Deficits**
  - Stunting
- **Risk of Nutritional Deficits**
  - Zinc and iron deficiencies (Siimes et al., 1984)
  - 1/3 of BF infants in Denver deficient in zinc & iron at 9 months of age (Krebs et al. 2006)
Which Foods are “Complementary”?

CFs should be nutrient-dense and contribute those nutrients which are limited in breastfed infants.
- Iron
- Zinc
- Calcium
- Vitamin D?

Which Foods are “Complementary”?

- Cereals provide iron
- Meats and poultry provide iron and zinc
- Cheeses & yogurts provide calcium
  - Usually not good sources of vitamin D
  - No cow’s milk before 12 months
- *Infants on vegetarian diets need iron and zinc supplementation*

Role of Repeated Exposure

- Consistently takes 8-10 exposures to taste for infant to accept novel food.
- Unfortunately, most mothers decide infant doesn't like food after 3-5 attempts.

*Nicklaus, 2011*
Slide 40

Role of Repeated Variety

- Infants accept a new food better if they regularly have exposure to novel foods.
- Include variety within and among food groups.
  - Exposure to a variety of fruits encouraged acceptance of new fruits, but not of new vegetables.
  (Nicklaus, 2011)

Slide 41

Breastfeeding and CF

- From infant’s perspective, breastfeeding is a continuation of exposure to family foods after pregnancy
  - In utero exposure via amniotic fluid
  - During breastfeeding, infant receives both repeated exposure to novel foods and variety
  (Hetherington et al, 2011)

Slide 42

Breastfeeding and CF

- BF eases the introduction of solid food
- Influences and develops infant’s taste preferences by repeated exposure to various flavors in mother’s milk.
- Influences later nutrition choices through early flavor experiences.
  (Beauchamp & Mennella, 2009)
Infants lack flavor varieties, often later described as “picky eaters”
ABM infants more likely overfed and overweight
- Caregiver typically controls feeding
- Introduction of CF replace breast milk calories but not formula calories, resulting in overfeeding

Related to increased vegetable consumption at 5 years of age
Associated with more varied taste preferences including bitter and umami
Associated with healthier diets later childhood and adulthood

Celiac Disease Rates Declined
- When infant was breastfed at age of first exposure, regardless of age.
- When breastfeeding continued after starting gluten-containing solids.
Slide 46

Breastfeeding During CF Outcomes

- Children less likely to develop adverse reactions if receive potentially allergenic foods while they still receive breast milk, regardless of age.

[Krawinkel, 2011]

Slide 47

Trends: FITS Study 2002-2008

- Longer duration of BF
- Delay in introduction of solid food
- Decreased fruit juice consumption
- Decreased soda and candy consumption

Slide 48

Trends: FITS Study 2002-2008

- Lower intake of fruits and vegetables than recommended
- Lower intake of iron-fortified foods for 9-12 month olds than recommended
- Cow’s milk before 12 months
- Low fat milk at age 1
Slide 49

How Do I Encourage Good Nutrition?

- Encourage exclusive breastfeeding for six months and continuation of BF for at least 1 year and beyond
- Encourage mothers to protect their milk supply once solids are introduced.

Slide 50

How Do I Encourage Good Nutrition?

- Treat breastfeeding as the nutritional norm for children 1 – 2(+) years of age
- Encourage your peers to do the same.

Slide 51

Examples of BF as a Nutritional Norm

- Diet history of child >1 yoa asks if currently BF
- Nutrition Education materials developed for children over 1 year of age include BF information.
Questions or Comments?

Donna W. Logan, RD, LD, IBCLC, RLC
Donna.W.Logan@uth.tmc.edu
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Name of Programme: Breastfeeding: The Gold Standard Conference 2014 Programme Date(s): 3/19-21/14

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☐ I have a competing interest or affiliation that could be perceived as having a bearing on my presentation. I have listed all current competing interests or affiliations below.

<table>
<thead>
<tr>
<th>Competing Interest or Affiliation*</th>
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Signature: ___________________________ Date: 2/15/14

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