An Evidence-Based, Cost-Sensitive Infant Formula Algorithm for the Infant on Georgia’s WIC

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Faculty Disclosure

- Centocor - Grant/Honorarium/ Consultant
- Given - Grant / Consultant
- Berlex - Grant
- Mead Johnson - Consultant
- Prometheus - Honorarium
- UCB - Grant
- SHIRE - Honorarium
- Abbott - Grant
- Nestle - Consultant
- Nutricia - Honorarium
- Astra Zeneca - Honorarium/Grant
- QOL – Grant / Consultant
Optimal Infant Nutrition

- BREAST IS BEST!

- Composition of breastmilk serves as basis for formula, but **cannot** be duplicated

- Casein to whey ratios can be adjusted to be similar to breastmilk, but types of casein and whey in cow’s milk are different

- Formula Manufacturers focus is to duplicate outcomes
AAP’s Indications for Infant Formulas

- As a substitute (or supplement) for human milk in infants whose mothers choose not to breastfeed (or not to do so exclusively),
- As a substitute for human milk in infants for whom breastfeeding is medically contraindicated
- As a supplement for breastfed infants that do not gain adequate weight
Need for Guidance

- Overabundance of types of formulas
- Manufacturer/Product name changes
- "Boutique" specialty formulas prescribed more often than expected
- Confusion/lack of understanding of “additives” with families and physicians
Basis for Infant Formula Algorithm

- Formula prescription should be medically indicated
- Decision should not be manufacturer biased
- Decrease parental influence
- Evidence based
- Specialty formulas used more often than expected
- Provides guidance for common conditions such as gastroesophageal reflux, infantile colic or irritability, allergies, rectal bleeding/colitis, malabsorption, and decreased weight gain
- Note- lactose reduced formulas are not covered due to extremely low incidence of true lactose intolerance in infants
Basis of Algorithm

- Cost sensitive
- Substantial cost difference between “routine” cow’s milk based formulas & “boutique” specialty formulas
- For WIC approved formulas, this translates into approximately $150 versus $510 or more per month for a single infant consuming 32 ounces of formula per day
- Our previous assistance to WIC GA credited with 52 million in savings. Since the algorithm adopted, 1% non-formulary use
**Average Monthly Cost of Georgia’s WIC-Approved Infant Formulas***

<table>
<thead>
<tr>
<th></th>
<th>Powdered (12 oz)</th>
<th>RTF (1 qt)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breastmilk with Vitamin D 400 i.u. daily supplement</strong></td>
<td></td>
<td>$4.80</td>
</tr>
<tr>
<td><strong>Tier 1 Formula</strong></td>
<td>Yield 85 oz/32 oz=2.65 30 days/2.65=11.32 cans a mo 12 cans x price $12.49=$149.88</td>
<td>Price $6.38 x 30 days= $191.40 $191.40</td>
</tr>
<tr>
<td>“Routine” Cow’s Milk Based (Partially Hydrolyzed 100% Whey)</td>
<td></td>
<td>$149.88</td>
</tr>
<tr>
<td><strong>Tier 2 Formulas</strong></td>
<td>Yield 90 oz/32 oz=2.81 30 days/2.81=10.67 cans a mo 11 cans x price $13.96=$153.56</td>
<td>Price $6.55 x 30 days= $196.50 $196.50</td>
</tr>
<tr>
<td>Soy Protein</td>
<td></td>
<td>$153.56</td>
</tr>
<tr>
<td>Cow’s Milk Based with Rice Starch</td>
<td>Avg. yield 91.5 oz/32 oz=2.85 30 days/2.85=10.52 cans a mo 11 cans x price $14.49=$159.39</td>
<td>Price $6.16 x 30 days= $184.80 $184.80</td>
</tr>
<tr>
<td>Partially Hydrolyzed Casein &amp; Whey (60% whey: 40% casein)</td>
<td>Avg. yield 87 oz/32 oz= 2.71 30 days/ 2.71= 11.07 cans a mo 12 cans x price $14.99=$179.88</td>
<td>Price $6.99 x 30 days= $209.70 $209.70</td>
</tr>
<tr>
<td><strong>Tier 3 Formulas</strong></td>
<td>Avg. yield 114 oz/32 oz=3.56 30 days/3.56=8.42 cans a mo 9 cans x price $24.84=$223.56</td>
<td>Price $9.17 x 30 days= $275.10 $275.10</td>
</tr>
<tr>
<td>Extensively Hydrolyzed Casein (100% casein)</td>
<td></td>
<td>$223.56</td>
</tr>
<tr>
<td>Extensively Hydrolyzed Casein with MCT oil (100% casein)</td>
<td>Avg. yield 112 oz/32 oz=3.50 30 days/3.50=8.57 cans a mo 9 cans x price $28.71=$258.39</td>
<td>Price $9.17 x 30 days= $275.10 $275.10</td>
</tr>
<tr>
<td><strong>Tier 4 Formula</strong></td>
<td>Avg. yield 90 oz/32 oz=2.81 30 days/2.81=10.67 cans a mo 11 cans x price $46.53=$511.83</td>
<td>Price $9.17 x 30 days= $275.10 $275.10</td>
</tr>
<tr>
<td>Amino Acid Elemental</td>
<td></td>
<td>$511.83</td>
</tr>
</tbody>
</table>

*Vitamin D 50 ml container = $8.33 (1 ml per day = .16 per ml x 30 days) = $4.80*
WIC...Supplemental Formula

- Maximum daily allowance of reconstituted formula
  - 6-11 Month fully formula fed yields 21.0 oz per day
  - Due to decreased amounts more formula, significant time WIC participant will have to buy formula. A cost effective formula would be beneficial.
Whole Vitamin D Cow's Milk should be started at 1 year of age unless formula is indicated.
Tier 1 Infant Formula

- “Routine” Cow’s Milk Based Protein Formula
- Due to Georgia’s WIC rebate contract, Gerber Good Start Gentle (Nestle) is considered a “routine formula” in this algorithm even though it is partially hydrolyzed whey
Breastfeeding or Tier 1 Infant Formula

To breastfeed or not to breastfeed…
Tier 2 Infant Formula

- Common condition - Gastroesophageal Reflux
- Characterized by the upward movement of stomach content, including acid, into the esophagus and sometimes into or out of the mouth.
- Concern arises with weight loss, FTT, feeding difficulties, intermittent torticollis, or respiratory symptoms
- Concern with Gastric Acid Blockers with Rice Starch Formulas
Tier 2 Infant Formula: Gastroesophageal reflux
Tier 2 Infant Formula

- Common condition - Infantile Colic
- Characterized by inconsolable irritability for a period of approximately 2-4 hours per day between 3 weeks and 4 months of age.
- When irritability is more prolonged or occurs outside those time parameters, other conditions including allergies, Gastroesophageal reflux, or infection should be considered.
- Non-specific may be non GI cause
Tier 2 Infant Formula: Infantile Colic/Irritability

- Infantile Colic/Irritability
- Milk Protein Allergy
- GI Bleeding
- Strong Fe of Allergy

- Soy Formula
- EVAL
- EVAL

- Soy Allergy/Intolerance

- Casein Hydrolysate

  - No Change
  - Improved
    - Mild Sx Initially
    - Severe Sx Initially
      - Recurrence
    - EVAL

- Amino Acid Elemental

  - EVAL

- Reintroduce "Routine" Formula at 6-9 mos. old
- Continue "Routine" Formula to 1 yr. old
- Continue formula to 1 yr. old
- EVAL at 1 yr. old
- Recreate Stable
Tier 2 Infant Formulas

- Common condition - Milk Protein Allergy
- May present with rash (atopic dermatitis/eczema), vomiting, wheezing, and/or cough.
- Studies demonstrate that 10-14% of infants with cow’s milk allergy also have reactions to soy.
- Those who have non-IgE reactions to milk may have a 40% cross-reactivity to soy.
- Thus, the majority of infants are likely to tolerate soy and this allows most to use soy formulas safely and with less expense than an extensively hydrolyzed casein formula.
Tier 2 & Tier 3 Infant Formulas

- Common condition: strong family history of allergy
- Evidence of atopy marked by asthma, eczema, allergic rhinitis or food allergy in a first degree relative), elimination of cow’s milk products with the use of an extensively hydrolyzed formula may lessen the development of atopic dermatitis and childhood food allergies.
- Alternatively, an extensively hydrolyzed casein formula can be employed initially or after a soy trial. This remains an area of controversy as noted above—and as a result either option is warranted.
GI Bleeding or Strong Family History of Allergy

**Term Infant**
- Breastmilk
- Supplementing or Not Breastfeeding
- "Routine" Cow's Milk Based Protein Formula
  - Infantile Colitis/Intractability
  - Milk Protein Allergy
  - GI Bleeding
  - Strong FH of Allergy
- Soy Formula
- Soy Allergy/Intolerance
  - Casein Hydrolysate
  - No Change
  - Improved
  - Amino Acid Elemental
- Reintroduce "Routine" Formula at 6-9 mos. old
- Continue "Routine" Formula to 1 yr. old
- EVAL
- Continue formula to 1 yr. old
- EVAL at 1 yr. old
- Severe Sx Initially
- Recurrence
- EVAL
Tier 3 & Tier 4 Infant Formulas

- Common condition: GI Bleeding
- When infection is not the cause, can be the result of infant formula/food or a food in the mother’s diet (usually milk or dairy products).
- Can be benign to life-threatening
- Milk is often the offending agent. The greater cross-reactivity to soy (30-64%) necessitates prompt transition to an extensively hydrolyzed casein formula.
Tier 3 & 4 Infant Formulas

- Common Conditions: Malabsorption
- Results in partially digested fat in the stool and often in distention, weight loss, a lack of weight gain and/or failure to thrive.
- Changing the formula is often only a temporary measure, but until evaluation can occur, an extensively hydrolyzed casein formula with medium chain triglycerides (MCT) would be indicated.
- The presence of failure to thrive may implicate other factors or conditions
- if they do not respond to a formula change within days, an amino acid formula may be indicated.
Pre Term Infant
(<37 weeks)

1. Breastmilk
2. Human Milk Fortifier until Discharge
3. Supplementing or Not Breastfeeding
4. Premature Formula Hospital Based (Pre-Discharge)
5. Transitional Formula until 6-9 months adj. age (Post-Discharge)
6. Medical or Nutritional Problems
7. Thriving and Asymptomatic
8. Revert to Algorithm A
9. "Routine" Cow's Milk Based Formula to 1 yr. of age
Resources

• GA Chapter AAP-Special Edition Newsletter
• Infant Formula Algorithm Poster
• Resource Guide
• Georgia WIC Program- WIC.GA.GOV
• AAP Coordinator- Kylia Crane RD

• What to Feed Your Baby (2013)
• What2FeedYourBaby.com
New Best Friend?

Blog and Articles
• Breastfeeding questions
• Infant Feeding / Solids
• Nutrients in different “milks”
• Reflux / Rectal Bleeding
• Celiac / Food Allergies
• Lactose Intolerance vs Allergies
• Obesity / Eating Disorders

Nutrient Levels / RDAs
• % by Age, Pregnancy, Lactating
• Calorie Counter / Nutrients

Parent Communities
• Products and Restaurants
• Personalized

Advisory Board

And that’s just the start