



Pediatrics Clinic

A Primer on Infant Formulas

Questions from parents regarding formula choices and gastrointestinal complaints are very common. The approach to these questions and complaints needs to be based upon an understanding of the formulas currently available and a knowledge of the common causes of gastrointestinal complaints.

Some basic and general principles always apply:

1. For the vast majority of formula-fed babies, a milk-based iron fortified formula (Enfamil or Similac) is the best choice. Any change in formula should be discouraged. If a change is made, it should be made on a logical basis. "Musical Formulas" games that parents (and sometimes health professionals) play can result in confusion about the correct diagnosis.
2. Iron in formula does not cause gastrointestinal symptoms. This has been proved beyond question and is not subject to controversy. Dietary iron is necessary for normal brain growth and development and must **never** be omitted from a baby's diet. For this reason, reputable formula manufacturers no longer produce totally iron-free formulas. New formulas are now available that contain rice starch or simplified proteins to help babies who have a lot of associated fussiness or gas or spitting up after taking formula. These formulas often have the designation "A.R." or "SENSITIVE" in their title. These are preferred over Soy formulas. 40% of babies with milk allergy will also be allergic to SOY.
3. Many parents depend upon formula supplementation through the WIC (Women, Infants, and Children) program. WIC will not provide alternate formulas without a prescription and a diagnosis. WIC will not provide low-iron formulas.

There are several common gastrointestinal complaints commonly blamed upon (but not necessarily caused by) infant formulas. Below is a brief discussion of some of these complaints:

1. Spitting up. *Gastroesophageal reflux* or *chalasia* affects as many as 50% of infants. SPITTING UP IS NORMAL and rarely requires treatment. Indications for treatment would include **complications** such as failure to gain weight, aspiration pneumonia, or reflux esophagitis. **Formula does not cause GERD** and a formula change will rarely improve it. Those anecdotal instances where a change in formula has helped probably involve minute variations in curd size formed by different formulas. However, a formula which forms larger curds (thus does not reflux as easily) is not necessarily a "better" formula. The treatment of **uncomplicated** GERD is reassurance and close follow-up.
2. Constipation. Infrequent bowel movements in infants is common and usually normal. If the last stool was soft and mushy, there is no constipation even if that stool was 5 days ago. Likewise, grunting and straining to pass a soft, mushy stool is probably normal and is not constipation. Hard, rock-like pellet stool IS constipation.

Constipation is not caused by iron. Parents must be assured of this. Iron-deficiency is a much more serious problem than constipation. Thus, iron would not be stopped even if it were the cause of hard stools!

Thick or pasty stools will sometimes be seen with milk-based formulas but are more common with soy formulas. Most true constipation develops after solids are started. Treatment options include dietary manipulation (prune juice, increased fiber), unrefined sugars (Malt-Su-Pex), and sometimes stool softeners (Colace drops). Formula changes rarely help.

3. Colic. Colic is a poorly understood syndrome involving paroxysmal fussiness in an otherwise healthy baby who tends to be temperamental and demanding for attention. The fussiness often (but not always) seems to be associated with abdominal pain (drawing the legs up) and gas production. Parents of infants with bad colic may present at wit's end and in need of much support and encouragement, and this is the most useful treatment we can offer.

Colic-type symptoms with guaiac (blood protein) positive stool or gross blood may indicate a *milk (or soy) protein allergy*.

There is actually evidence that some babies with colic will do better on an elemental formula such as Nutramigen or Alimentum (see below). This is quite expensive and thus should be attempted only in a supervised situation with close follow-up.

Simethicone drops are also used sometimes for colic. This is also expensive, albeit probably harmless. It may occasionally help.

4. Diarrhea. : Loose stools are normal for exclusively breastfed infants. Thus loose stools would be the ideal product of a formula-fed baby. Loose stools in formula fed babies are, however, relatively uncommon. When they do occur, they should be viewed as normal unless they appear to be associated with acute illness or *malabsorption*.

Some rare forms of malabsorption may be formula-related. **Disaccharide** (lactose or, less commonly, sucrose) **intolerance** is historically overdiagnosed. Other than transient disaccharidase deficiency associated with acute gastrointestinal illness, true congenital lactose (MILK) intolerance is actually quite rare. If there is clinical evidence of malabsorption diarrhea, close follow-up is necessary to insure that more potentially serious causes (celiac sprue, cystic fibrosis) are not overlooked.

The primary formulas used for infants are discussed briefly below. Don't lose sight of the fact that human breastmilk is the ideal food for infants. **There is virtually no reason to ever switch a baby from breastmilk to formula.**

Similac with Iron / Enfamil with Iron

These are the mainstays for formula fed infants. They are based on cow's milk but the milk proteins have been modified to be safely digestible by a human infant. These formulas are relatively inexpensive and will suit the nutritional needs of the vast majority of formula fed babies.

Enfamil AR

This is a fairly new product which increases the formula's viscosity by adding rice (hence the **AR**) protein to the formula. There may be some babies with moderate reflux who improve with this formula, however there may be other digestive concerns worsened by the increase in viscosity. This product is now available through the WIC program.

Similac or Enfamil for sensitive stomach: contain rice starch to naturally thicken the formula and make it easier to hold down; may also contain simplified (broken-down) proteins that are easier for immature infant stomachs to digest and handle; Newborn, Sensitive, Total Comfort, For Spit-up, and A.R. preparations are currently available.

Similac Lactose-Free and Enfamil LactoFree

Made by Enfamil, this is a cow's-milk based product with glucose polymers instead of lactose. Used for lactose intolerant babies (a rare condition, as described above). This formula is more expensive than milk-based or soy formula and is not provided by WIC at this time.

Isomil / ProSobee

These are the standard soy-protein formulas available. Soy formulas use sugars other than lactose as the main carbohydrate source, thus they are acceptable in the treatment of lactose intolerance (rare, I remind you again). Soy protein formulas can also be used to treat milk-protein allergic babies (also rare - see below) and to treat babies who have gastrointestinal damage from milk protein (milk protein enteropathy). Caution must be advised, however, **because as many as 40% of milk-allergic babies will also be soy-allergic.** There is also cross-reactivity between milk protein allergy and soy protein allergy. An elemental formula may be a better choice.

Elemental formulas (Nutramigen, Pregestamil, Neocate, Elocare)

These formulas are the products of much research; as such they are quite expensive. Because these formulas include their nutritional elements in a largely "pre-digested" form, they are hypoallergenic, well absorbed, and lactose-free. Unfortunately, this lends to their use in a "shotgun" approach. That's not necessarily bad, as long as proper follow-up is carried out.

Allergy

Allergy to milk protein (or soy protein) causes typical allergy manifestations. Eczema, reactive airways and even allergic rhinitis will occasionally occur in a formula-fed infant. It should be noted that allergic symptoms are more often due to something besides the formula. However, a trial of a hypoallergenic formula (Nutramigen or an A.R. formula) is easy enough to be worth a try.