

Nutrition for Patients with Anorectal Malformations

Food and nutrition not only impact the growth of a child but also influence the developmental milestones a child achieves. Specific nutrition guidelines have been designed to improve the quality of life of children who are born with an [anorectal malformation](#) and can have a major impact. A dietitian's role with a patient who is born with an ARM depends on the patient's specific malformation and their overall prognosis for bowel control. Based on this information, nutrition intervention may be as simple as adding a few foods to the diet to avoid constipation or as dramatic as avoiding multiple foods to prevent diarrhea.

Patients are divided into two main categories, those with potential for bowel control and those with fecal incontinence. Nutrition recommendations are developed and advised based on each individual's case. Many patients who are born with an ARM do not have bowel control and suffer from fecal incontinence. These patients need [bowel management](#), which is an artificial way to keep them clean. They usually benefit from some form of nutritional intervention.

Case Study One:

5 year old female, born with an anorectal malformation, incontinent of stool, has no potential for bowel control, on bowel management receiving a daily enema to artificially remain clean.

Children who have no chance of bowel control with a tendency toward firm stool and receive a daily enema, do not require any specific nutrition modifications. If the child is successful at staying clean, (no accidents in-between enemas) the patient can eat whatever they desire and are counseled to eat an age appropriate healthy diet.

Case Study Two:

4 year old male, born with an anorectal malformation, incontinent of stool, no potential for bowel control with a tendency towards loose stools.

A small percentage of children who are born with an ARM have a tendency towards diarrhea and have a hyperactive colon. Nutrition modification for this group includes a strict diet along with medication to help slow down the intestines. The constipating diet is designed to decrease the

transit time of food through the digestive tract. The goal is to slow the colon down so much that only the 24 hour enema empties the accumulated stool. The diet is very restrictive in the beginning but over time new foods can be carefully introduced.

If there is a food the child is craving then parents are encouraged to introduce that food for three days and observe closely what changes occur with bowel movements. If the child soils after eating a newly introduced food, then that food should be eliminated from the diet. The process of liberalizing the diet is a continuous trial of adding new foods and observing stool consistency changes. Not everyone has the same reaction to the same foods. Learning to identify the foods that control an individual's bowels is helped by journaling to record the effect of a food on bowel control. Due to the limited food choices in Phase I of the Constipating Diet, a daily multivitamin with mineral supplement is recommended. [Table 1]

Table I: Phase I Constipating Diet

Food Groups	Food Recommended	Food to Avoid
Milk and Milk Products	Rice Milk	All others
Vegetables	None	All
Fruits	Applesauce, Apples without skin, bananas	All Others
Starches, Bread and Grain	Bread, crackers and cereals made from refined flours, pasta and noodles made from white flours, white rice, pretzels, white potatoes without skin, dry cereals such as: Rice Krispies, Rice or Corn Chex, Corn Flakes, Kixx.	All Others
Meat or Meat Substitutes	Baked, broiled, boiled or grilled meat, poultry or fish	All Others
Fats and Oils	Limit amounts of butter, margarine and oils in food preparation during this	All

	phase, non-stick spray is allowed	Others
Sweets and Desserts	Made from allowed ingredients, plain cake, gelatin or popsicles, Rice Dream Frozen Dessert and limit amounts of concentrated sweets such as jelly and marshmallows	All Others

The foods listed above are recommended in Phase I of the constipating diet. Once the child remains clean on this diet a new food can be added and tried for three days to observe the effect of that food.

Case Study Three:

4-year-old male born with anorectal malformation with potential for bowel control, in need of laxatives to treat constipation.

Many patients present with fecal incontinence. Some of those patients, once their constipation is adequately treated, become continent and can have voluntary bowel movements. To find these patients when we suspect this type of "pseudoincontinence," we perform a laxative trial. Patients with a good prognosis original anorectal defect, with a good sacrum, and good muscles fall into this category. The patient is instructed to implement a high fiber/laxative diet in addition to the daily laxative medication. The high fiber portion of the diet uses a guideline for a daily total number gram of fiber equal to age plus 10. For example if the child is 5 years old, the grams of fiber recommended per day would be 15.

There are two types of fiber; water-soluble and water insoluble. Water-soluble fiber prolongs stomach-emptying time. Sugars consumed are released and absorbed more slowly, forming a gel when mixed with liquids which helps to soften stool in the colon. Water insoluble fiber moves bulk through the intestines. This promotes regular bowel movements and helps to prevent constipation. If your child is taking laxatives, a combination of soluble and insoluble fiber will bulk and soften the stool. This is an ideal combination and allows the laxative to be more effective.

In addition to incorporating foods that are high in fiber we also recommend including foods that produce a "laxative effect." [Table II] Keep in mind that each patient has their own unique digestive

tract. Foods that may function as a laxative for some patients may cause constipation for others. Foods that may produce a laxative effect are high fat, highly spiced and high in caffeine. The colon is stimulated to move after eating, so it is recommended to eat only three meals a day and eliminate snacking. A diet with similar foods eaten at about the same time each day with approximately the same amount at each meal day after day will help promote regularity. Fluids are allowed in-between meals. To help toddlers follow this regimen, we suggest including a good source of protein and fat at each meal to prevent hunger pangs in-between meals.

If your child is a "picky eater," there are alternatives to achieving fiber goals in the diet. Fiber supplements, flax seeds, and pectin can be added to foods that children like in order to increase the fiber content of the diet. Families already following a high fiber diet or who have tried this in the past meet with a dietitian to provide new ideas to achieve more variety at meal times and increase the fiber content of the meals. Using high fiber versions of "Kid Friendly" foods enhance acceptance of the diet long term. [Table III] As children get older, frequent education helps them understand how their food choices affect bowel function. Incorporating diet principals into lifestyles allows for freedom and flexibility and long term success.

Table II: Foods that may produce a "laxative" effect:

Age	Food
0-introduction of solids	Breastmilk
4-6 months	<ul style="list-style-type: none"> -Oatmeal or mixed grain cereal -Baby prunes
6-8 months	<ul style="list-style-type: none"> -Foods listed above -Fruit and vegetable baby foods -Prune juice -Apple juice
8-12 months	<ul style="list-style-type: none"> -Foods listed above -Finely chopped fresh or cooked vegetables: spinach, carrots, cabbage, broccoli, peas,

	<ul style="list-style-type: none"> -sweet potato, corn, green beans, cauliflower, etc. -Finely chopped fresh fruits: cherries, grapes, pineapple, strawberries, avocado, mango, papayas, plums, apricots, peaches, pears, raspberries, blueberries, oranges, etc. -Finely chopped pieces of dried fruit: raisins, apricots, prunes, dates and figs -High fat dairy products: known to produce a laxative effect for some and constipation for others -High-fat foods: may function as a laxative food for some and a constipating food for others.
1 year and older	<ul style="list-style-type: none"> -Foods listed above -Dark chocolate, spicy foods and caffeine may be introduced if and when parents feel it is age appropriate.

Table III: High Fiber Kid Friendly Foods (note serving size may vary depending on age)

Type of Food	Serving Size	Grams of Fiber per serving
Multigrain cheerios	½ cup	1.5
Sliced fresh fruit with yogurt dip	1 cup	~3
Cut up fresh vegetables with veggie dip	1 cup	~3
Homemade trail mix	¾ cup whole wheat chex small box raisins 1oz peanuts	9
Sun chips	11 chips (1oz)	2
Popcorn	2 cups	2.3

Whole grain wheat thins	17 crackers	2
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Fiber supplements:

Type of Supplement	Grams of Fiber	Serving Size
Benefiber	3	1 tbsp
Metamucil	3	1 tbsp
Ground flax seeds	1.9	1 tbsp
Whole flax seeds	2.8	1 tbsp

Case Study Four:

Three month old female born with an anorectal malformation recently had her pull through and then her colostomy closure.

Infants that are born with anorectal malformations are encouraged to follow a "laxative diet" until they are ready to attempt potty training. Ideally, this means one to two well formed but soft bowel movements per day. If possible, mothers should breast feed their babies due to breast milk's natural laxative effect. Once the infant is ready to start solids, between four and six months of age parents should introduce oatmeal cereal instead of rice cereal. Oatmeal has more fiber, and rice cereal may cause constipation. Parents can also add baby prunes to the oatmeal or offer mixed grain cereal mixed with fruit. Parents can give baby prune juice as well as apple and grape juice to help keep things moving. Between 6-8 months of age the parent can start fruits and vegetables. Making strained baby foods increases the quantity of fiber the infant will receive. Otherwise baby food fruits and vegetables with the highest quantity of fiber listed are best. Introduce one food per week to assess for food allergies. As the infant grows and starts trying solids, offering high fiber choices will help mold the child's taste buds. Foods that should be avoided during early infancy and the toddler stage are any white starches, and bananas due to their reputation for causing

constipation. A lot of parents ask the question, "Will my child become constipated once they transition to whole milk from formula?" The answer is: everyone is different. At this age toddlers are used to drinking the majority of their calories and are still in the process of trying new textures and tastes. Some children that drink excessive amounts of milk with minimal food intake may become constipated. To avoid this, provide enough milk in combination with other dairy products to meet the calcium needs for age [Table IV and V]. Keep in mind that large amounts of dairy products may constipate some children and have no effect on others.

Table IV: Calcium recommendation

Age	Calcium
0-6 months	210 mg/day
7-12 months	270 mg /day
1-3 years	500 mg/day
4-8 years	800 mg/day
Boys and Girls Ages 9-18	1300 mg/day

Table V: Which foods are good sources of calcium?

Food & Serving Size	Calcium (mg)	Food & Serving Size	Calcium (mg)
Yogurt, nonfat plain, 1 cup	400	Almonds, ¼ cup	94
Milk, skim, 1 cup	302	Bok Choy, ½ cup, cooked	79
Ricotta, part skim, ½ cup	337	Turnip greens, ½ cup, cooked	99



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Swiss, 1 oz.	272	Orange, 1 medium	56
Mozzarella, part skim, 1 oz.	183	Collard greens, ½ cup, cooked	178
Macaroni and Cheese, ½ cup	180	Kale ½ cup cooked	90
Cheese Pizza, 1 slice	220	Broccoli ½ cup cooked	36
Canned sardines, w/bones, 3 oz.	330	Tofu, firm (calcium set), ½ cup	258
Canned salmon, w/bones, 3 oz.	181	Black-eyed peas, 1 cup	212
Calcium enriched orange juice, 1 cup	200	Navy beans, 1 cup	128
Calcium enriched soy milk, 1 cup	300		

Contact the Colorectal Center at Cincinnati Children's

For more information or to request an appointment for the Colorectal Center at Cincinnati Children's Hospital Medical Center, please [contact us](#).