

How to help your child with

CONSTIPATION

Natural alternatives to Miralax



**Use:**

Once one copy is purchased naturopathic physicians may reproduce this guide freely for use in their own clinical practice. This guide must not be altered in any way.

Non-physicians: please do not reproduce this guide as it jeopardizes our ability to continue to provide you new content at an extremely reasonable price.

Disclaimer:

This guide is intended to be used under the guidance of a naturopathic physician or pediatrician. It is not intended for treatment or diagnosis of any condition.

This guide is provided for educational purposes only and does not constitute medical advice. This guide is not to be a substitute for seeing a physician and in fact the author highly advises physician supervision for the evaluation of any health complaint.

The author does not assume any liability for the failure to seek medical advice or for any loss or bodily harm from following treatment ideas without consulting a physician. You should never delay seeking medical advice or treatment because of anything written in this guide.

The author has made every effort to ensure that the information in this guide is accurate at press time. However, the author does not assume any liability to any party for loss, damage, or disruption caused by errors or omissions, whether such errors or omissions result from negligence, accident, or any other cause.

No part of this guide may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval system, without written permission from the author (with the exception listed above). This guide is the intellectual property of Dr. Erika Krumbeck, naturopathic physician.

A note from Dr. Erika,



I have outlined an approach that I typically use with my patients who have constipation (ranging from mild/moderate to severe). Always check with your child's physician before starting any new treatment program. It is incredibly important to rule out bowel impaction or any serious medical cause of constipation before starting any treatment, as it has the potential to be dangerous.

Naturopathic physicians like myself always like to address the underlying cause of why a child has constipation in the first place. (Inadequate fiber? Not enough water? Poor digestive function?) Giving herbs or medications to treat a symptom is not enough, and will quickly lead to relapse. This checklist is designed to start with, and address the foundations of health first!

Resource guide and checklist.

Speak with your child's physician about their recommended approach to constipation treatment. Naturopathic physicians typically recommend using the following approach in a step-wise fashion. Start with the check-boxes at the top of the list (e.g., Increase dietary fiber). If there is no improvement then move on to the next check box. The first three check boxes can be done simultaneously. After this most physicians will recommend trying only 1-2 check boxes at a time for a period of a few days to a few weeks. Bowel retraining can (and should!) be completed alongside all the other steps.

Checklist:

- Increase dietary fiber
 - Using Healthy Eating Plate to teach fiber intake
 - Using Constipating/Non-Constipating Foods Chart to teach fiber intake
- Increase hydration
- Eliminate dairy (x 2-3 weeks)
 - Investigate other food sensitivities, if necessary
- Stimulate peristalsis
 - Add probiotics (2-3 weeks to see improvement)
 - Consider ginger root tincture, glycerine or extract, especially with older children
 - Consider bitters
- Bowel retraining*
 - Daily routine and rewards
- Stimulating a bowel movement as a part of bowel retraining
 - Physical activity/knee-chest position
 - Castor oil abdominal massage
 - Sorbitol-containing fruit juice
 - Magnesium citrate as a laxative



- Senna or other stimulating laxative
- Glycerine suppositories
- Saline enema
- Ask your child's physician for basic bloodwork (see below) or a referral to a gastroenterologist.

As a naturopathic physician I would consider the following labwork for a child who is not improving:

- Thyroid screening (TSH, free T4)
- Comprehensive metabolic panel
- Celiac disease antibodies
- Whole blood lead
- Consider IgG food sensitivity testing, if not previously completed.
- Consider stool culture & sensitivity or comprehensive digestive stool analysis test - rule out dysbiosis, especially bacteroides, clostridia spp and pseudomonas spp. Treat if necessary.

If no abnormalities in labwork consider referral to gastroenterologist for manometry and gastric transit studies.





Constipation

What is normal?

Here's a little guideline of what is normal for kids:

- **Babies 1 week old or less** usually have 4 or more bowel movements (poops) each day. They are usually liquidy or extremely soft.
- **Babies 3 months old or less** can have bowel movements as often as several times per day, or as infrequent as once per week. Breastfed babies tend to have less frequent poops because breastmilk is highly absorbable, which doesn't leave much "left" to make a poop with. If babies are very uncomfortable when passing stool (poop) then this is still considered problematic.
- **By age 2** most children have at least 1 bowel movement per day. They should be easy to pass, formed, no blood in the stool, not pellet-like. Ideal is at least 1 bowel movement per day (though it can be technically "normal" to go 2-3 days without defecating).

If your child doesn't meet the guidelines listed above, or is having painful stools or behavior changes around the time of defecation then this would be considered abnormal stooling behavior.

Step 1: Increase fiber intake.

This is by far the most common cause of constipation I see in my office.

To understand why fiber works we have to understand a little about the anatomy and physiology of the intestines. Food is supposed to be digested by the stomach and then further digested and absorbed in the small intestine. By the time food reaches the end of the small intestine all digestible/absorbable food should be gone (absorbed completely). Everything else (mostly dietary fiber) gets dumped into the large intestine. Dietary fiber forms the bulk of “food” that cannot be digested and absorbed – this leaves extra material for the large intestine (or “colon”) to squeeze together and form into stool (poop). This dietary fiber is incredibly important because it is what the good gut bacteria (“happy bugs”) live off of. These “happy bugs” provide lots of awesome nutrients for our colon and help regulate our immune system. They also help stimulate the nerves that squeeze the colon and physically push out a poop.

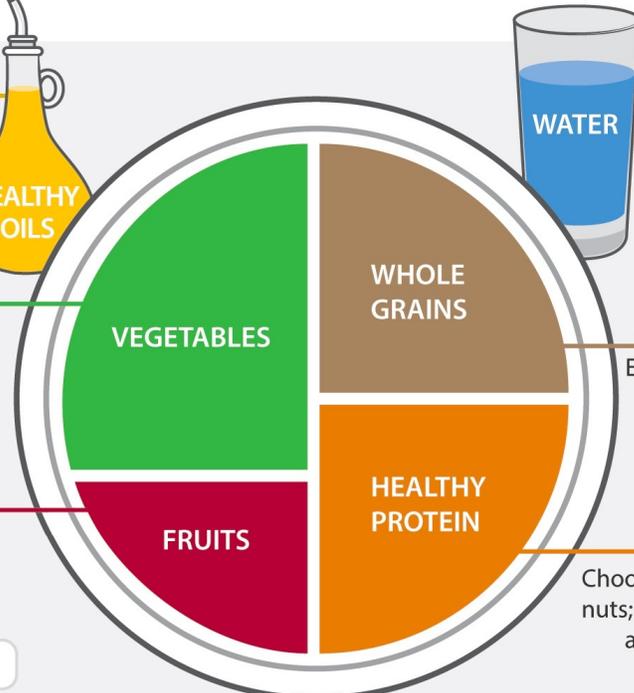
No fiber = nothing for the colon to push against! No fiber = no happy bugs. (No happy bugs = unhappy immune system and no stimulation of the nerves.) No fiber = no poop!!!

The general recommendation is for children to consume 5-10 grams of fiber per day plus the child’s age. 3) (e.g., a 2 year old should have 7-12 grams of fiber.) That’s great, but most families have absolutely no idea what that means.

Below are two great strategies for ensuring good fiber intake. You can try one or both methods to make sure your child is getting enough fiber.

Strategy #1: Healthy Eating Plate.

HEALTHY EATING PLATE



HEALTHY OILS
Use healthy oils (like olive and canola oil) for cooking, on salad, and at the table. Limit butter. Avoid trans fat.

WATER
Drink water, tea, or coffee (with little or no sugar). Limit milk/dairy (1-2 servings/day) and juice (1 small glass/day). Avoid sugary drinks.

VEGETABLES
The more veggies – and the greater the variety – the better. Potatoes and French fries don't count.

WHOLE GRAINS
Eat a variety of whole grains (like whole-wheat bread, whole-grain pasta, and brown rice). Limit refined grains (like white rice and white bread).

FRUITS
Eat plenty of fruits of all colors.

HEALTHY PROTEIN
Choose fish, poultry, beans, and nuts; limit red meat and cheese; avoid bacon, cold cuts, and other processed meats.

STAY ACTIVE!

© Harvard University

Harvard School of Public Health
The Nutrition Source
www.hsph.harvard.edu/nutritionsource

Harvard Medical School
Harvard Health Publications
www.health.harvard.edu

In my office I like to do a drawing of a plate – here we can use the image from Harvard Public Health. The most important thing to notice about the plate is that half the plate is fruits and vegetables. If you are making spaghetti and meat sauce as your main dish (or falafel, or rice and beans, or quinoa and chicken, or chicken nuggets and brown rice, or hot dogs, or whatever) – your main dish should fill up no more than half the plate. The other half needs to be filled with fruits and vegetables! This is the easiest way to guarantee having enough fiber.

Examples of non-constipating foods: most vegetables, especially green leafy vegetables, most fruits (not fruit juice, except prune juice), whole grains (quinoa, brown rice, whole wheat, oats), nuts, seeds, beans (legumes).

Please note that I do not recommend over-the-counter fiber supplements like metamucil or fiber gummies to increase fiber. Dietary fiber needs to come from the diet - not supplements! Also, I see a lot of kids (and adults) have bad reactions to wheat-based fiber supplements like metamucil. We know that some sensitive kids and adults can end up with Irritable Bowel-like symptoms from use of wheat-based fiber supplements.

Summary:

- Children should eat **5-10 grams of fiber per day plus the child's age:**
 - **Example:** 2 year-old needs 7-12 grams of fiber per day.
- Follow the "1/2 the plate" rule:
 - Half of your child's plate should be **fruits and vegetables.**
- **Your child should be eating more non-constipating foods than constipating foods.** (The right hand column should be more than the left-hand column!)

Step 2: Hydrate

Drink, Drink, Drink! Yes, yes yes! When you increase fiber it will automatically draw water with it - this means that kids who are increasing their fiber intake need to drink more than they did before. Without increasing water intake there is a chance that increasing fiber will actually make constipation worse!

Make sure your child is not consuming any caffeinated beverages (sodas, energy drinks or coffee drinks). Kids should drink 4-8 cups of water per day - preferably one big glass with each meal.¹⁾ Kids who are dehydrated may need to simply drink more water in order to have their constipation improve. Consult your physician if your child has any kidney, cardiovascular, or metabolic problems.



Summary:

- Make sure your child is drinking plenty of water. **Aim for 4-8 cups of water per day, or 1/2 the child's weight in ounces.**
- When increasing fiber it is incredibly important to increase water intake. **High fiber diets can worsen constipation if the child does not drink enough water.**

Step 3: Try an elimination diet

The first food I recommend eliminating is cow's dairy. We know that greater than 1 in 3 children with constipation are dairy sensitive. 4) Kids with dairy sensitivity are more likely to have a runny nose, skin rashes and asthma than other kids. 5) If this is your child I highly recommend switching to a non-dairy milk like Almond, Flax, Hemp or Rice milk. (I do not recommend soy milk unless it is in rotation with other dairy-free milks, as there is a concern that the phytoestrogens in soy could alter hormones in both boys and girls.)

Remember that even in non-sensitive kids excessive cow's milk intake will lead to constipation eventually. Kids need no more than 1 cup of milk three times per day to meet calcium requirements (and there are lots of other ways to get calcium that are dairy-free). That translates to 1 milk for each meal. I often see problems with kids who sip on cups (or sippy cups) of milk throughout the day. Remember that excessive cow's dairy can also cause iron deficiency anemia, which is a huge problem for development. 6) (Iron deficiency anemia can be hard to detect in kids; sometimes the only symptoms are behavioral problems, ADHD, or problems in school.)

Next frequent food intolerances include gluten, soy, eggs, yeast, bananas, nightshades and corn. For more information on how to do a food elimination challenge/diet please see the Naturopathic Pediatrics Elimination/Challenge Diet Handout.

Summary:

- **Cow's dairy** is the number one food-cause of constipation. More than 1 in 3 children with constipation are dairy sensitive.
 - Children with dairy sensitivity are more likely to have a runny nose, skin rashes and asthma than other children. If this is your child then we highly recommend trying a **one-month dairy elimination**.
 - **Eliminate all cow's milk, cheese, yogurt, ice-cream, and any milk products.**
- Speak with your physician about eliminating other foods if necessary. Next frequent food intolerances include **gluten, soy, eggs, yeast, bananas, nightshades and corn**. For more information on how to do a food elimination challenge/diet please see the [Naturopathic Pediatrics Elimination/Challenge Diet Guide](#).

Step 4: Stimulate peristalsis

Peristalsis is the movement of the entire gastrointestinal system from “top” to “down” (esophagus to rectum). It is what pushes food in a downward direction. Peristalsis causes the intestines to squeeze in a normal snake-like manner, so that a lump of food travels through the tube. See an awesome video of [peristalsis in the large intestine](#).

Children with constipation often have - or develop - abnormal peristalsis. The normal “wave” that should push food down and out in a bowel movement becomes impaired, which makes it difficult to defecate.

Things that stimulate normal peristalsis: probiotics, especially high-dose probiotics. Probiotics have been shown in infants to increase number of evacuations per day and reduce colic. 7) Specifically *L. reuteri* has been shown to be helpful in infants. For older children and adults probiotics have been shown to speed transit time of the gut (how fast things move through our intestines), and reduce constipation. 8) For older children and adults *Bifidobacteria* have been shown to be most helpful.

Remember that most over-the counter probiotics are notoriously terrible - many brands have been studied and were shown to contain no active, alive strains - or worse, some were shown to have the wrong strain of probiotic. The only brands I recommend are Pharmax HLC series (HLC neonate, HLC high potency, or HLC intensive. There are also other specific HLC strains), Seroyal/Genetra HMF series, Culturelle, or Klaire Labs probiotics (Ther-Biotic infant, Ther-Biotic child, Lactoprime Plus SCD compliant probiotic, or ABx support). Personally I use Klaire Labs probiotics in my practice, either Ther-Biotic infant, Ther-Biotic child, or Lactoprime Plus if we suspect gut dysbiosis or SIBO. I have no affiliation with the company.

Because probiotics have so many other truly beneficial effects – possibly preventing colds & flu’s, preventing asthma, decreasing allergic responses – I highly recommend this therapy.

Other options:

Ginger has been shown to speed gastrointestinal motility. 9) Older children can take over the counter ginger capsules, younger children can try ginger chews or ginger tincture drops – but please consult your physician for dosage guidelines and safety. Ginger can (and often does) cause upset stomach or burning, and definitely should be used under physician guidance.

Acupuncture has also been shown to improve constipation by speeding gut motility. 10), 11) Acupuncture is helpful for so many things, especially relaxation and decreasing the “nervous” response. Make sure to find an acupuncturist who is very experienced with children.

Herbs which are under the category “Bitters” can also be helpful for atonic constipation. Herbal bitters like Yarrow, Gentian, Blue Flag, Dandelion, and Berberine-containing herbs (like Oregon Grape and Berberis) may all be helpful. Please consult an experienced herbalist or naturopathic physician – most bitters are contraindicated in pregnancy, breastfeeding and early infancy, and can cause significant harmful side effects if dosed improperly. When used properly these herbs can be very powerful, however. They should be administered in small doses, preferably mixed in a synergistic formula.

Summary:

- Peristalsis is the movement of the entire gastrointestinal system from “top” to “down” (esophagus to rectum). It is what pushes food in a downward direction. Peristalsis causes the intestines to squeeze in a normal snake-like manner, so that a lump of food travels through the tube.
- **Children with constipation often have - or develop - abnormal peristalsis.** The normal “wave” that should push food down and out in a bowel movement becomes impaired, which makes it difficult to defecate.



- Things that stimulate normal peristalsis:
 - Probiotics
 - Ginger
 - "Bitter" herbs
 - Acupuncture



Step 5: Bowel Retraining

Bowel retraining is the most important step in permanently curing constipation. Bowel retraining involves changing behavior and stimulating normal peristalsis at normal times of the day.

Have your child sit on the toilet at least daily. ¹⁾ (Some physicians recommend several times per day, preferably after meals.) At a minimum I recommend setting the child on the toilet at the same time each day, preferably in the morning (either upon waking or after breakfast). It is normal and physiologic to wake up and need to have a bowel movement - I prefer to encourage a morning bowel movement to mimic nature as closely as possible. This is especially important for school-aged children who often hold stools during the day to avoid using a public bathroom.

Here is the key: toilet time must be highly reinforced with positive encouragement and rewards. It must be a positive experience each and every time the child sits on the toilet. Oftentimes children need to be bribed or rewarded heavily - use sticker charts, reading favorite books, favorite treats/snacks, watching TV or playing games on the phone - whatever works. (It's okay to throw out the "parenting rules" a little bit - at least at first.) Remember that many kids have very negative associations with the toilet when they become severely constipated, and we need to completely change that association. Make sure to not punish the child for bathroom accidents or inability to have a bowel movement.

Bowel retraining is the most important step in permanently curing constipation. Bowel retraining involves changing behavior and stimulating normal peristalsis at normal times of the day.

Summary:

- **Have your child sit on the toilet at least daily.** Set the child on the toilet at the same time each day, preferably in the morning upon waking or after breakfast.
- **Toilet time must be highly reinforced with positive encouragement and rewards.** It must be a positive experience each and every time the child sits on the toilet.



- Make sure to not punish the child for bathroom accidents or inability to have a bowel movement.

Stimulating a bowel movement as a part of bowel retraining

Follow your physician's advice on which step to use first.

- 1. Physical activity and knee-to-chest positions.** Keep your child physically active. Lack of physical activity has been shown to increase obesity and constipation. For younger children you can try the "knee-to-chest" position which places pressure on the bowels and relaxes the rectum/anus making it easier to have a bowel movement.
- 2. Castor oil abdominal massage.** Apply a small amount of castor oil to your fingertips. Using gentle motion and flat fingers, move your hand in a clockwise motion over your child's abdomen. Castor oil is anti-inflammatory and extremely soothing . You can consider adding 1-2 drops of lavender or peppermint essential oil in 1 tablespoon of castor oil for older children. Use about 1/2 - 1 teaspoon of this mixture, more if necessary to lightly coat the abdomen. For more information see Dr. Harpster's article at <http://naturopathicpediatrics.com/2015/01/19/tummy-massage-every-body/> Alternately, you can do a flannel castor oil pack to the abdomen and leave it on over night. (See your naturopathic physician for guidelines on how to do a castor oil pack.)
- 3. Prune juice or other sorbitol-containing juice.** Sorbitol is a sugar alcohol (but it is not alcoholic, so there is no need to worry about giving this to your child). Sorbitol is very slowly absorbed by our intestines and tends to draw water into the gut which relieves constipation. You can try prune juice (organic) or Fruit-Eze paste. Children with gut dysbiosis or small intestinal bacterial overgrowth (SIBO) tend to worsen on sugar alcohols - if this happens to your child then contact your physician for a stool or breath test to check on this.
- 4. Magnesium citrate or magnesium hydroxide (Milk of Magnesia) as a laxative.** If stools are still not soft enough to have a bowel movement then it may be time to

consider a laxative to help get the process started. Follow dosage instructions from your physician or see chart below. Most children will need to continue to use the laxative for a period of a few weeks to potentially months until they establish normal bowel habits. **Speak with your child's physician before starting magnesium** - very rarely it may be "contraindicated" (not to be used) in children with certain kidney conditions, or may interfere with their medications. Look for a milk of magnesia without added ingredients.

Laxative	Dose*	Timing
<p>Magnesium hydroxide. Osmotic laxative. (Brands: Phillips, Milk of Magnesia, Pedia-lax saline laxative)</p>	<p>Choose dosage of 400 mg/5 ml. (It comes in 400 mg/5 ml and 800 mg/5 ml).</p> <p>Children age 1-11: 1-3 ml/kg or 0.5 - 1.5 ml/lb. Max dose 60 ml daily (in divided doses or individually).</p> <p>Example: 1/2 - 1 ml for each pound your child weighs. (15 - 30 ml for a 30 pound child.)</p> <p>Children age 12-adult: 30-45 ml daily of 400 mg/5ml solution, or 15-30 ml daily of 800mg/5 ml solution.</p>	<p>Stools in 30 min - 6 hours</p>
<p>Magnesium citrate. Osmotic laxative. (Brands: Swan Citroma, Equate magnesium citrate, CALM magnesium, and many others, including professional brands.)</p>	<p>Children <6 y/o: 2-4 ml/kg or 1-2 ml/lb daily of 1.745 g/30 ml solution.</p> <p>Children 6-12 y/o: 100-150 ml daily of 1.745 g/30 ml solution.</p> <p>Example: 1 - 2 ml for each pound your child weighs. (Swan Citroma or Equate Magnesium citrate).</p> <p>OR</p> <p>Powdered Magnesium Citrate: Children >6 y/o: start with 500 mg Magnesium Citrate (e.g., CALM brand), increase by 250 mg daily until loose stools form.</p> <p>Children <6 y/o: start with 250 mg Magnesium Citrate, increase by 125 mg daily until loose stools form.</p>	<p>Stools in 30 min - 6 hours.</p>



5. Senna tea, drops, or tablets. Stimulating laxatives tend to be habit-forming, so consult your physician before using. Limit use to 2 weeks before transitioning to magnesium, prune juice, or other laxative. Senna products are often sold under the brand name "Ex-Lax." Though they frequently have some artificial colorings, flavoring and preservatives, they are readily available. Look for natural alternatives with equal dosage amounts in your local natural health food store if your child is sensitive to artificial ingredients. Again, speak with your child's physician before starting any Senna products. * (see references for dosage instructions)

Laxative	Dose	Timing
Senna. Stimulant laxative. (Brands: ExLax, Senokot, Fletcher's laxative for kids, various other senna syrups and teas.)	Senna syrup, 8.8 mg sennosides/ 5 mL or tablets 8.6 mg sennosides/tab. 1 - 2 years: 1.25 - 2.5 ml, once to twice daily 2 - 6 years: 2.5 - 3.75 ml, once to twice daily 6 - 12 years: 5 - 7.5 ml (or 1-2 tabs), once to twice daily 12 - adult: 5 - 15 ml (or 1-3 tabs), once to twice daily	Stools in 6-12 hours

6. Other laxative alternatives: Sorbitol 70% solution (not fruit juice), Lactulose 70% solution, or mineral oil can also be given. Vitamin C given in large doses can also provide laxative effect, but the dosage varies from patient to patient, and should be given under physician supervision.

Laxative	Dose*	Timing
Sorbitol 70% solution. Osmotic laxative	Children age 1-11: 1 ml/kg, 1-2 times per day. (Max dose 30 ml/day) Children age 12-adult: 15-30 ml once to twice daily	Stools in 24-48 hours

Laxative	Dose*	Timing
Lactulose 70% solution. Osmotic laxative.	Children age 1-11: 1 ml/kg, 1-2 times per day. (Max dose 30 ml/day) Children age 12-adult: 15-30 ml once to twice daily	Stools in 24-48 hours
Mineral oil. Lubricant laxative. (Multiple generic brands available.)	Children age 1-11: 1-3 ml/kg, once daily (maximum 45 ml daily) Children age 12 - adult: 15-45 ml once daily	Stools in 6-8 hours. Oil seepage is common.

- 7. Glycerine suppositories.** These can be helpful in infants or young children who have fecal impaction. The glycerine hydrates the stool which makes it easier to pass. Remember that these can also be habit forming, especially in younger children and infants. (Many infants who require disimpaction with a rectal thermometer will learn to only have a bowel movement when the thermometer is inserted - it becomes a conditioned response.)
- 8. Saline enema.** If fecal impaction is present then sometimes an enema is the only way to loosen the stool and remove the impaction. It is incredibly important to use enemas correctly - **they may be uncomfortable, but they should NOT cause pain for the child.** Always consult your physician before administering an enema, they can be dangerous if given inappropriately.

Directions for administering an enema:

- Have your child lie on his stomach with knees pulled under him, or in a hands and knees (crawling) position. Place plenty of towels underneath the child in case of leakage.
- Remove the protective cap and lubricate the tip of the enema with KY jelly or another lubricant.
- Gently slide the tip past the anal sphincter, pointing the nozzle in the direction of the child's belly button. Push gently and follow the path of least resistance. Push the tip or nozzle 1-2 inches into the rectum. **STOP if the child is in distress.**
- Squeeze a few tablespoons of solution into the rectum, or follow directions from your physician. Squeeze the enema tube very gently to give a small, slow stream of solution into the rectum.
- Remove the enema tip and place the child on the toilet. If they are unable to have a bowel movement within 15 minutes then try again with another enema, using slightly more solution.
- **Again, STOP if the enema is causing pain at any point!**

Enemas should not be used in infants unless otherwise directed by your physician.

What to do when this is not enough:

If these tricks don't work then it is time to do a more thorough work-up with your physician.

Go to the doctor if:

- There is severe pain along with the constipation
- There is blood in the stool
- After trying an enema the child still does not have a bowel movement and you suspect the stool is impacted
- The child has a fever that started as the constipation started
- There is a sudden change in how your child is having bowel movements (e.g., a baby usually goes every 2 hours, suddenly stops going for 2 days)
- A newborn who does not pass meconium within 48 hours of birth.



References

- 1) Manu R Sood, FRCPCH, MD. Functional constipation in infants and children: Clinical features and differential diagnosis. UpToDate. Web. 18 March 2015.
- 2) Fontana M, et al. Bowel frequency in healthy children. *Acta Paediatr Scand*. 1989 Sep; 78(5):682-4.
- 3) Williams CL, et al. A new recommendation for dietary fiber in childhood. *Pediatrics* 1995; 96:985.
- 4) Irastorza I, et al. Cow's-milk-free diet as a therapeutic option in childhood chronic constipation. *J Pediatr Gastroenterol Nutr*. 2010 Aug;51(2):171-6. doi: 10.1097/MPG.0b013e3181cd2653.
- 5) Daher S, et al. Cow's milk protein intolerance and chronic constipation in children. *Pediatr Allergy Immunol*. 2001 Dec;12(6):339-42.
- 6) Paoletti G, et al. Severe iron-deficiency anemia still an issue in toddlers. *Clin Pediatr (Phila)*. 2014 Dec;53(14):1352-8. doi: 10.1177/0009922814540990. Epub 2014 Jul 2.
- 7) Indrio F, et al. Prophylactic use of a probiotic in the prevention of colic, regurgitation, and functional constipation: a randomized clinical trial. *JAMA Pediatr*. 2014 Mar;168(3): 228-33. doi: 10.1001/jamapediatrics.2013.4367.
- 8) Dimidi E, et al. The effect of probiotics on functional constipation in adults: a systematic review and meta-analysis of randomized controlled trials. *Am J Clin Nutr*. 2014 Oct;100(4):1075-84. doi: 10.3945/ajcn.114.089151. Epub 2014 Aug 6.
- 9) Micklefield GH, et al. Effects of ginger on gastroduodenal motility. *Int J Clin Pharmacol Ther*. 1999 Jul;37(7):341-6.
- 10) Qin QG, et al. Acupuncture at heterotopic acupoints enhances jejunal motility in constipated and diarrheic rats. *World J Gastroenterol*. 2014 Dec 28;20(48):18271-83. doi: 10.3748/wjg.v20.i48.18271.
- 11) Zhang T, et al. Efficacy of acupuncture for chronic constipation: a systematic review. *Am J Chin Med*. 2013;41(4):717-42. doi: 10.1142/S0192415X13500493.



12) De Schryver AM et al. Effects of regular physical activity on defecation pattern in middle-aged patients complaining of chronic constipation. Scand J Gastroenterol. 2005 Apr;40(4):422-9.

13) Bromley D et al. Abdominal massage in the management of chronic constipation for children with disability. Community Pract. 2014 Dec;87(12):25-9.

14) Shukla R et al. Fecal Microbiota in Patients with Irritable Bowel Syndrome Compared with Healthy Controls Using Real-Time Polymerase Chain Reaction: An Evidence of Dysbiosis. Dig Dis Sci. 2015 Mar 18. [Epub ahead of print]

15) Zoppi G et al. The intestinal ecosystem in chronic functional constipation. Acta Paediatr. 1998 Aug;87(8):836-41.

*** *Dosage instructions come from:***

16) Author unknown. Constipation Treatment Recommendations When Child Is Over One Year of Age, for New Diagnosis or Recurrence of Symptoms. Seattle Children's Hospital. 2016

17) Author unknown. Pediatric Constipation Treatment and Referral Guidelines: a collaboration of pediatric gastroenterologists from the Departments of Pediatrics at Carolinas Health Care, Duke University, East Carolina University, University of North Carolina, and Wake Forest University and primary care physicians from across North Carolina. Updated May 2012. Web. Accessed 2 Nov 2016.

