



Childhood Defecation Disorders: Constipation and Stool Incontinence

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The purpose of this publication is to describe the characteristics and treatment for pediatric functional gastrointestinal disorders that prompt parents to bring their child to the doctor for constipation and/or stool incontinence: infant dyschezia, functional constipation (FC), and non-retentive fecal soiling. A *functional* disorder refers to a condition where the abnormality is an altered physiological function (the way the body works) rather than an abnormality that is characterized by tissue damage or inflammation. "Functional" means that the symptoms occur within the expected range of the body's behavior. (Examples: Shivering after a cold swim is a symptom, but not due to disease; a runner's leg cramp is very painful, but the muscle is healthy.)

Genetics, diet, social habits, convenience, cultural beliefs, relationships within the family and timing of daily activities influence how often a child has a bowel movement (BM). In healthy children, the number of BMs changes with age and diet. Infants average four BMs each day during the first week of life. There is a decline to about two BMs each day by age two, and one BM each day by age four. Healthy breast-fed infants may have no BMs for weeks. New parents may want to have the symptom checked by a pediatrician, but should be reassured by the absence of alarm symptoms such as vomiting, fever, failure to gain weight, or abdominal distention. Any of these alarm symptoms, along with the infrequent passage of stool, should prompt a visit to the pediatrician.

Constipation is defined by a reduced stool frequency, or by painful BMs, even when the stool frequency is not reduced. Constipation accounts for 3% of visits to the pediatrician, and about 25% of visits to the pediatric gastroenterologist. Constipation is a problem for about 1 in 6 children at some time. Boys and girls are equally affected.

Infant Dyschezia

Diagnosis requires both of these features in an infant less than 9 months of age:

1. At least 10 minutes of straining and crying before successful or unsuccessful passage of soft stool
2. No other health problems

Dyschezia means difficulty coordinating the two voluntary acts that are necessary to pass a BM: contracting abdominal muscles and relaxing the pelvic floor. Parents visit the clinician during their infant's first six months of life concerned that their child is constipated. The parents describe a healthy infant, who cries for 10–30 minutes, screaming, and turning red in the face with effort, until a BM finally takes place or not. Stools are soft and free of blood. These crying episodes, exhausting for the infant and anxiety provoking for the parents, occur several times

daily. Assessment includes charting the infant's growth, history (including diet), and a complete physical examination (including rectal examination) as the parents watch. All are normal, and the parents are reassured by the clinician's careful examination.

For everyone, a successful BM requires two coordinated events: relaxation of the pelvic floor muscles (a thick sheath of muscles that span the underlying surface of the bony pelvis), and an increase in abdominal pressure to push out stool. Infants with dyschezia have not yet learned to coordinate those two required actions. Crying is how they increase their abdominal pressure. They cry until, by chance, they relax their pelvic floor muscles at the same time and a BM occurs.

For the first few weeks of life many activities such as sucking, swallowing, urinating and stooling are accomplished by instinct alone. As development proceeds, instinct goes away and the child learns how to eat based on smell, taste and texture, how to urinate based on the physical urge, and how to have a BM. Dyschezia may occur during a brief time between the normal loss of instinct and the mastery of responding to the body's signal to have a BM by relaxing the pelvic floor and tensing abdominal muscles.

Reassurance to the parents is all that is needed. No tests or treatments are necessary. The infant is not crying from pain. The infant will learn to have BMs more easily in a few days to a few weeks. Suppositories and rectal stimulation interfere with the infant's learning to coordinate the act. They should not be part of the treatment.

Functional Constipation (FC)

Diagnosis must include one month of at least two of the conditions listed:

1. Two or fewer BMs per week
2. History of holding back stool, trying to avoid having a BM
3. Painful or hard BMs
4. Large, wide BMs
5. A large mass of stool waiting to pass at the end of the bowel
6. In children of developmental age of 4 years or older, at least one episode of BM into underclothes per week

The diagnosis of FC requires no testing. The diagnosis is based on meeting the diagnostic criteria listed above.

Accompanying symptoms include irritability, abdominal cramps, and decreased appetite. These symptoms disappear immediately following the passage of a large BM. Sometimes FC is associated with bedwetting, and 10% of affected girls get urinary tract infections.

If there are worrisome signs like poor weight gain, persistent abdominal distention, unexplained fevers, Down syndrome, bilious vomiting, occult spinal dysraphism [neurological involvement of spina bifida], then a thorough evaluation is appropriate.

Infants and children who pass soft stools at intervals greater than a week apart and fail to thrive will require a diagnostic evaluation for an abnormality in gastrointestinal anatomy or metabolic disease. Delayed passage of meconium, the sticky dark, first BM of the newborn is associated with Hirschsprung's disease. Hirschsprung's disease is a lack of nerve (ganglion) cells in a segment of the bowel. This interferes with the squeezing action (called peristalsis), which normally moves stool through the intestines.

FC begins in young children when there is a painful or frightening BM and the child learns to fear the urge to have a BM. They begin to hold back when they get the urge and a huge stool builds up in their rectum. Often, children are able to hold back the huge stool for weeks, but when they pass gas, small amounts of liquid or solid come out with the gas, soiling the underclothes. (See Figure) *Encopresis* is a psychiatric term meaning that children with a developmental age greater than 4 years put BM into inappropriate places, like their underwear.

FC often begins during one of three times: 1) in infants, at the time of weaning from breast milk to formula, with a change in BMs from soft to hard pellets, 2) in toddlers during toilet training as they struggle with issues of controlling BMs, and 3) in children beginning school, where they must hold back the urge to have a BM to stay seated in class.

A history and a careful physical examination provide reassurance to the clinician and parents that there is no disease, but that there are symptoms caused by a failure to relax the pelvic floor and push out the BM. Often, there is a mass of stool that the physician can feel on either side of the abdominal muscles when examining the belly. When the diagnosis is FC, no testing is necessary. Diseases of the colon have a different history and physical examination than FC. (See Table) If there is a history of constipation from birth, no retentive posturing, or no passage of huge BMs, then it is important to test for Hirschsprung's disease and other rare colon motility diseases. Remember that 1 in 6 children will have constipation, and Hirschsprung's disease is the most common colon motility disease, with a rate of 1 in 5000 children, so chances of having Hirschsprung's or any other serious disease is small.

Infants and toddlers

From a developmental point of view, FC is a failure in toilet learning. Normally, when an infant senses a need for a BM, he or she relaxes their bottom and at the same time increases abdominal pressure. Infants have months to practice this behavior before the opportunity to hold back a BM becomes a social choice. FC begins when the child fears passing a BM, most often because BMs are big and hard and hurt as they come out. When you are fearful, you cannot relax your bottom. The child's bottom contracts instead of relaxing, as the child attempts to avoid having a BM. The inside walls of the colon stretch to hold the contents, and the urge to have a BM passes in a few minutes. Over weeks and months the end of the colon stretches out. The infrequent passage of very large stools may cause not only pain, but also tears in the *anus*, the short canal at the end of the digestive tract. These painful tears, called anal fissures, bleed and frighten child and parents.

Children with FC sit on the toilet and push, but because they are afraid, they are unable to relax their bottoms, so the BM does not come out. Parents often report that the child tries really hard to push it out. It is true that they push, but at the same time they are not relaxing their bottom. When you are afraid, you cannot relax your bottom.

Parents become increasingly distressed by their child's symptoms, and contact a clinician. Some clinicians recommend suppositories or enemas, thinking that as uncomfortable as the procedure is, it will succeed in expelling the big BM. In adults this makes sense, but in children, it is shortsighted. Suppositories and enemas take control away from the child, and may frighten the child even more. These interventions do not help the child relearn how to relax their bottoms and have a BM. The next time there is an urge for a BM, the child may be more frightened, and hold back even more. Instead, we recommend reassurance that the stool is not toxic to the body, the colon never pops, and the child should go home and take oral medicine to help melt away the large BM. The child remains in control of the decision to have a BM. This child-friendly plan is developmentally appropriate at all ages.

Efforts at toilet training must be suspended until the toddler's fear goes away and is replaced by confidence, motivation and a desire to please.

School-age children

Sometimes FC lasts only a few weeks, but sometimes it lasts for years. Many affected school-age children develop negative thoughts about themselves, and wrongly believe that they are the only ones with this problem. To cope, they behave with nonchalance concerning soiling and denial about constipation. They claim to be unaware of odors. Some hide soiled underclothing or pieces of stool around the house. Their denial of the problem is a big part of the problem. The child is unable to cooperate with parents, school or clinician because the child denies that there is a problem. These children shrug their shoulders and tell the doctor that they do not know why they are in the doctor's office. They show little interest in treatment, and they frustrate their parents. Parents who follow doctor's instructions find that treatments fail. Treatments fail because regardless of how much stool collects in the colon and how uncomfortable the child may be, the child may refuse to relax the pelvic floor to allow a BM. Treatment succeeds only after the child decides to participate by attending to the sensations that signal a need to have a BM, and behaving by going to the restroom and relaxing his or her bottom.

Treatment

It is important to understand the problem as the child understands it. In infants and preschool children, it is all about fear. As children experience a period of painless BMs for several months, their fear goes away and they learn how to relax their bottoms. Until the fear is gone, toilet training will fail. When the fear resolves, the child will express interest in toilet training.

In school age children, it is all about denial. Affected children may be secretive about the problem, and pretend that it does not exist. Before treatment works for them, they must accept responsibility for recognizing the urge to have a BM and cooperate by taking their medicine and relaxing their bottoms.

Treatment goals for the clinician, as outlined in recommendations from the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN), are

to educate the child and family about the problem, to assist the child in evacuating any hard, large stool in the rectum, and to use medication to assure painless defecation, facilitating re-training.

Education includes teaching the parent and child that FC: 1) is not a disease, but symptoms due to failed toilet learning, 2) always gets better when the child chooses to relearn the correct way to have a BM, 3) is not dangerous – it never causes cancer, the colon never bursts, toxins never go back into the bloodstream, no matter how long between BMs, and 4) is very common. The child is not alone.

Fruit juices such as prune and pear may increase stool water by virtue of their fructose and sorbitol content, carbohydrates that are poorly absorbed by the small intestine. When changes in diet do not help, non-stimulant laxatives like polyethylene glycol, mineral oil, lactulose, and Milk of Magnesia can be effective, but only under a doctor’s supervision. To assure painless defecation, non-stimulant stool softeners may be given safely every day for months or even years, under the direction of your child’s physician. The goal is to make sure that there will always be soft BMs, with a diameter less than that of a quarter. Polyethylene glycol has become the most popular medicine, because it mixes colorless, odorless, and tasteless into the child’s favorite drink.

Differentiating Functional Constipation (FC) from Disease*		
Feature	FC	Disease
Starts at Birth	Rare	Common
Fecal Soiling	Common	Rare
Fecal Mass Above Rectum	No	Common
Retentive Posturing (holding back)	Common	Rare
Passage of Very Large Stools	Common	Rare
Painful Bowel Movements	Common	Rare

*This table is not intended to replace diagnosis and treatment of your child by a qualified pediatric doctor.

Mineral oil is a lubricant and softener with many favorable qualities. There is a commercial form of mineral oil (Kondremul plain) that mixes easily into infant formula or flavored milk, so that infants and children who are reluctant to take medicine are unaware of the mineral oil. Milk of magnesia, lactulose, and sorbitol (the substance found in prune juice that makes BMs soft) are other choices for softening the BMs. Lubiprostone (Amitiza) is a medicine which induces secretion of water into the bowel to promote soft BMs. Many teens prefer to take a tablet rather than to drink a polyethylene glycol. Adherence to instructions may be improved when teenagers make their own choices about which treatment they want. In the end, the most appropriate choice and dose of stool softener for your child are determined by the physician.

Two problems must be overcome for the child to stop holding back – the large hard stools and the fear (ages 6 months to 4 years) or shame and denial of the problem (ages greater than 4 years). Although the non-stimulant stool softener solves the problem of large hard stools, changing the child’s state of mind often takes many months. It is important for parents to be consistent about medicating the child every day, because one painful BM will cause more fear, and more holding back.

Usually, polyethylene glycol or other stool softeners can be stopped after several months free from pain and soiling. Relapses are common, especially during vacations away from home, when the child is hesitant to use unfamiliar restrooms, and times of stress. A successful initial treatment plan serves as the model for relapse treatment. Relapses tend to resolve quickly.

The clinician should provide continuing availability. The clinician is an empathetic teacher who helps the child relearn how to have a BM without pain, and helps the family understand the nature of the problem. Weekly visits and/or telephone or e-mail accessibility provide effective reassurance and an opportunity for positive reinforcement for good results.

Some patients benefit from other interventions:

1. Star charts or stickers for appropriate behaviors like sitting on the toilet or having a BM in the toilet.
2. Pelvic floor physical therapy or anorectal biofeedback may be helpful for some older children seeking a way to learn how to relax the pelvic floor muscles faster than trial and error at home.
3. Drugs that stimulate an urge to go may be helpful in training some patients to recognize and respond to the sensation.
4. Collaboration with a mental health professional is helpful when FC is one of a cluster of behavioral symptoms such as temper tantrums and sleep disorder in toddlers, associated with attention deficit disorder in schoolchildren, or the presenting symptom of a distressed family situation.

In general, it is not necessary to fuss with diet and fiber.

What parent wants to battle their child about diet when they are already struggling over BMs? The wise clinician prescribes sufficient stool softener and avoids dietary restrictions.

Punishment for episodes of incontinence does not work. It may make symptoms worse. It is much better to reward desirable behaviors than to punish bad behaviors. When there is stool in the underwear, it is best for parents to maintain a neutral stance, and without anger create an expectation that a school-age child can clean himself and his dirty underwear.

Prognosis

Roughly half of the children referred to a pediatric gastroenterologist have a successful outcome, defined by 3 or more soft stools/week, and no episodes of stool incontinence (in children older than 4 years) after one to six months of treatment. Why so many treatment failures? Factors that interfere with treatment success may include the state of mind of the child and/or the caregivers. The child must believe that he or she can get herself better, and be motivated to work on changing maladaptive behaviors. The caregivers’ acceptance of the clinician’s instructions, and the caregivers’ expectation that the child can get him or herself better are similarly important for treatment success. Some children get themselves better as they move from the primitive denial defense to insight. In adolescence they get motivated to change their toilet behaviors rather than hide them. A few children continue to have problems with constipation into adult life.

Non-retentive Fecal Incontinence (FI)

Non-retentive FI is defined in a child with a developmental age greater than 4 years by all of these features:

1. Defecation in places inappropriate to the sociocultural context
2. No evidence of holding back stools to avoid defecation
3. After appropriate evacuation, the FI cannot be explained by another medical condition

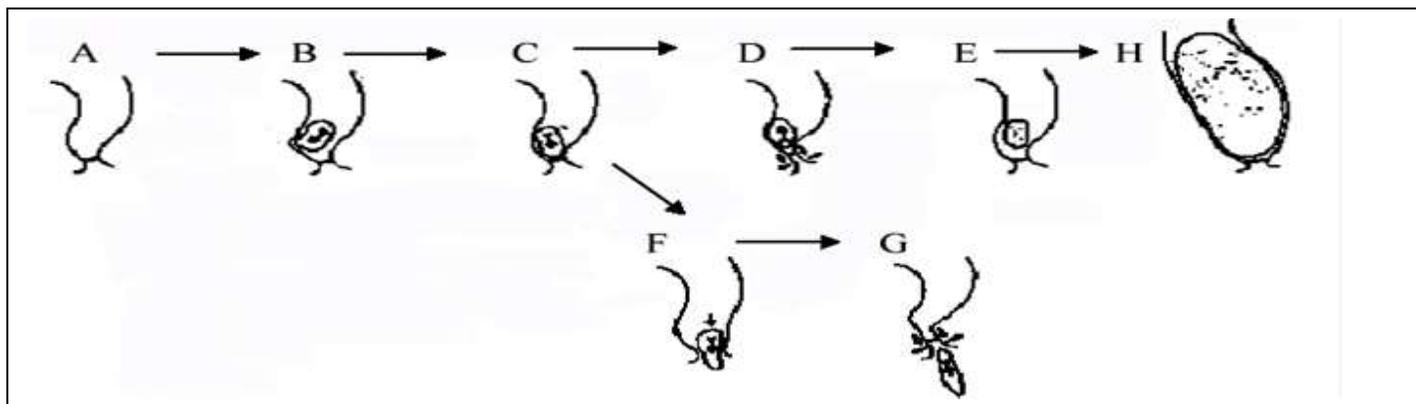
FI refers to passage of BMs into the underclothing, or other inappropriate places. FI commonly accompanies FC, when liquid BM leaks out as the child attempts to pass gas. FI without fecal retention occurs when someone has diarrhea, as the muscles of the bottom fatigue and cannot hold back anymore. *Non-retentive FI* is the diagnosis applied to children with a developmental age of at least 4 years, who have BMs in places and at times that are inappropriate, at least once a month for at least 2 months, in the absence of a disease to explain it, and without signs of fecal

retention. About one in ten incontinent children has non-retentive FI. The rest have FC.

Most children with non-retentive FI have BMs daily during waking hours and do not complain of constipation. Soiling may be in small amounts or consist of an entire BM. In contrast to children with FC and incontinence, children with non-retentive incontinence do not hold back their BMs and do not accumulate a big stool.

Sometimes non-retentive FI is caused by an emotional disturbance in a school-aged child. Often the soiling episodes have a relationship to a person or time of day, because defecation may be triggered by anger in children who meet diagnostic criteria for oppositional-defiant disorder or conduct disorder.

Treatment goals are to help the parent understand that there is no medical disease and to accept a referral to a mental health professional. Parents need guidance to understand that incontinence is a symptom of emotional upset, not simply bad behavior.



- A. The rectum is empty. There is no urge to defecate.
- B. Stool enters the rectum and stretches the rectal wall, causing a sensation of fullness.
- C. Rectal wall distention causes relaxation of the internal anal sphincter, allowing the stool to descend into the proximal anal canal. This movement causes awareness that stool passage is imminent.
- D. The pelvic floor muscles contract to maintain continence, moving the stool upward and out of the anal canal.
- E. If the stool remains in the rectum after the pelvic floor returns to its resting state, then stool will no longer be in contact with the anus. The rectal wall relaxes; reducing the pressure and wall tension, and the urge to defecate abates.
- F. Defecation occurs when the pelvic floor muscles relax, and the pressure in the rectum is greater than pressure from the external anal sphincter and the pelvic floor. Stool moves from the region of higher pressure to the area of lower pressure. The accompanying increase in intra-abdominal pressure propels stool through the anus.
- G. The pelvic floor contracts again when stool is no longer in contact with the anus, and this forces out any remaining stool.
- H. If a child repeatedly responds to the urge by withholding (C and D), a fecal mass accumulates. Over time the fecal mass becomes too large and too firm to be extruded without painful stretching of the anus. The mass is too bulky to be shifted out of contact with the lining of the anal canal. As pelvic floor muscles fatigue, the anus becomes less competent and leaking soft or liquid stool occurs. The child resorts to retentive posturing, attempting to avoid leaking stool by contracting the gluteal muscles. Also, everyone passes gas about 20 or 30 times a day. The sensitive lining of the rectum can tell the difference between gas and the big, hard stool. Also, the lining of the rectum can tell the difference between liquid and the big, hard stool. But, the lining of the rectum cannot sense the difference between gas and liquid, so that sometimes children relax their bottoms for just a second to let gas out, but liquid stool leaks out, too.

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