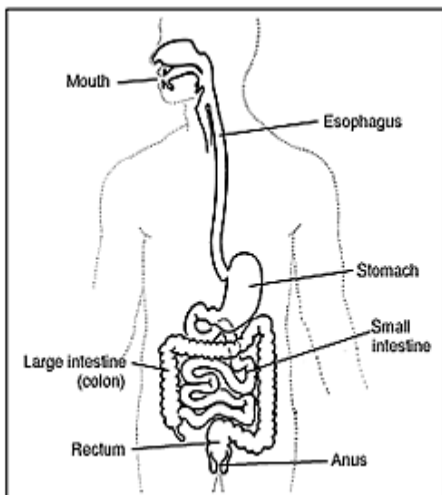


## BOWEL FUNCTION ANATOMY

Most of America gives little thought to bowel control. However, bowel control is actually a complex process involving the coordination of many different muscles and nerves.

The bowel is considered to be a part of the digestive or gastrointestinal system. It is designed to help the body absorb nutrients and fluids from the foods we eat and drink. After taking out everything the body needs, the bowel then expels the leftover waste.



The beginning of the bowel is the small intestine, sometimes referred to as the small bowel. This is where the useful nutrients are absorbed from what you eat. The small bowel delivers the waste to the colon, or large bowel. The colon is a 5-6 foot long muscular tube that delivers stool to the rectum. As the stool moves through the colon, the fluids are removed and absorbed into the body. The consistency of the stool is dependent upon many things, including how long the stool sits in the colon, how much of the water has been absorbed from the waste, and the amount of fiber and fluids in your diet. Stool consistency can vary from hard lumps to mushy to very loose, watery stool. The best and easiest consistency of stool is soft, like toothpaste; this consistency may be attained by adding

fiber to your diet. Fiber helps move waste through the colon because it is indigestible by the human body. In other words, fiber adds 'bulk' to the stool. It is important to eat a diet high in fiber, however, most Americans lack fiber in their diet. Up to 25-35 grams of fiber may be required by the body to keep the bowels healthy and moving. If your bowel movements are too loose, fiber can make them firmer; on the other hand, if your stools are too hard, fiber can make them softer.

Another factor that helps to control the consistency of your stool is fluid. The amount of decaffeinated fluids (decaffeinated soda, juice, water) helps to determine how soft your stools are and how easily they are expelled. If the colon does not have enough fluids to absorb from the waste, the stool will be dehydrated, resulting in hard, lumpy stool that is difficult to pass.

Caffeine is a diuretic. It draws fluid from your body and excretes it as urine. This dehydrates your body which forces the colon to pull extra water from the stool. Again, your stool will become dehydrated and will be hard, lumpy, and difficult to pass. For every cup of caffeinated fluids, MBCP recommends that you drink 2 cups of decaffeinated fluids. Also, do not rely on the foods that you eat for fluid. The water in your food should be considered bonus fluids.

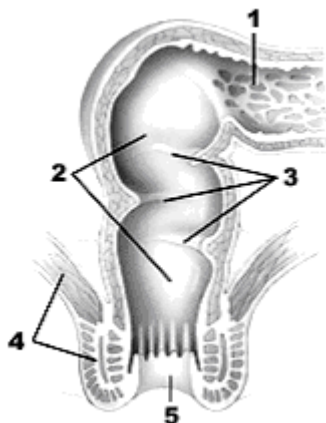
It is rarely the case that a person drinks too much fluid. Drinking too much fluid may become problematic if you cannot hold urine or if you have certain heart or kidney diseases. If you have a question about water in regards to your health, you should ask your doctor. In a healthy person, any excess fluid your body doesn't use will just be excreted as urine.

In most adults without bowel disease, a diet high in fiber and drinking 1-2 quarts of decaffeinated fluids a day will produce soft stools that are easy to pass. Fluid and fiber work together to encourage healthy bowel habits. You must eat a diet high in fiber and drink plenty of decaffeinated fluids. Remember, “healthy” stools should be the consistency of toothpaste being squeezed from the tube – soft and free flowing.

The speed at which food moves through the digestive system varies. Depending on the type of food present, it can take an average of one to three days to process. Up to 90% of that time being spent in the colon. People have many different perceptions of bowel habits. Normal bowel habits range from 3 times a day to 3 times a week. Not everyone will have a bowel movement daily.

Some people have difficulty moving food through the colon. We label this problem as slowed or delayed colonic transit time. Sometimes, taking medication to speed up transit can assist these people. On occasions, surgery may be necessary.

Stool enters the rectum (2) from the colon (1). There are two major muscles the stool must pass through to exit the body, the internal sphincter muscle and the external sphincter muscle (4).



The internal sphincter muscle is “involuntary”. It automatically relaxes and opens at the top of the anal canal to allow stool to pass through. As the stool enters the upper anal canal, it is “sampled” by the sensitive nerve cells. People with normal nerve sensation have the urge to have a bowel movement. The external sphincter muscle is a “voluntary” muscle; you have control over this muscle. It assists in keeping the stool in the rectum until you are ready to have a bowel movement. In fact, squeezing the external sphincter muscle pushes the stool out of the anal canal (5) and the rectum relaxes. The urge to have a bowel movement is gone until the next colon contraction hits the rectum. Frequent holding of

stools can cause constipation and desensitization of nerve cells. The longer the stool remains in the colon and rectum, the more fluid is absorbed, and the harder the stool becomes. This is why it is important to move your bowels when you feel the urge to have a bowel movement. A person with very loose or runny stools (diarrhea) will need urgent access to a restroom. Loose stool can slip through the sphincter muscles quickly without the person knowing.

## MUCLES OF THE PELVIC FLOOR

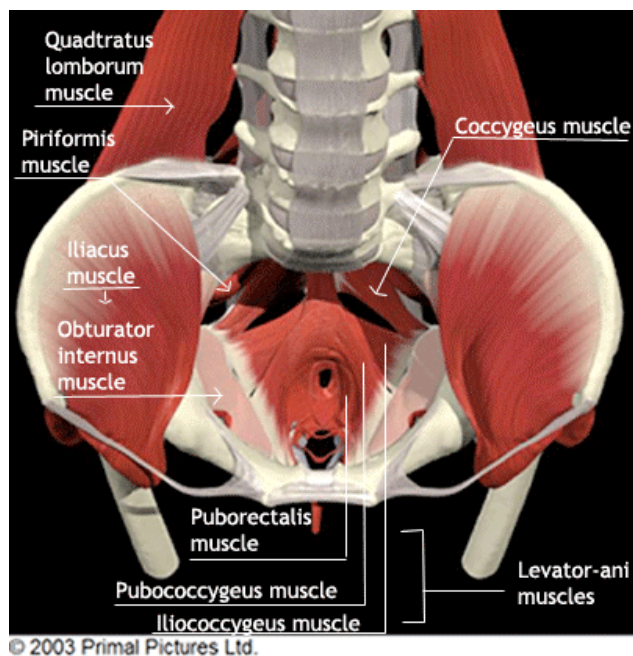
The ability to retain and expel stool is dependent on the muscles of the pelvic floor. The pelvic floor muscles ‘hold’ your organs where they should be and aide in many actions such as childbirth and having a bowel movement. These muscles are under voluntary control. The two major muscles of the pelvic floor are the levator ani muscle and the puborectalis muscle.

The levator ani muscles arise from the pelvic sidewalls and run downward to form a funnel in the pelvis, helping to support the anal canal, the urethra and in women, the vagina. These muscles are in close contact with the sidewalls of the pelvic organs.

The puborectalis muscle provides a ring of support around the anal canal at the small end of the funnel made by the levator ani muscle. It has a “U” shaped

configuration creating an angle between the anal canal and the rectum. Under resting conditions this angle is 90°, but during straining and moving your bowels this angle moves to 135°. If these angles are not correct, it may become more difficult to have a bowel movement.

## CONSTIPATION



The levator ani and the puborectalis need to coordinate properly in order to expel contents from the anal canal. If you don't have full control over your pelvic floor muscles, or if they spasm frequently, you may develop constipation. When the muscles aren't working properly, they can block the anal canal, making it very difficult to have a bowel movement. This can be called an outlet obstruction and pelvic floor / rectopubalis dyssynergia. It is like pushing through a closed door.

Physical therapy can assist with retraining the pelvic floor muscles to coordinate properly, thus returning to the proper anal-rectal angles. They can also assist with relaxing your muscles if they are spasming. Sometimes, simply being able to relax will assist with proper muscle functioning. Relaxation, distraction (from focusing on the bowel movement), and meditation techniques can be learned to assist with this process.

Physical therapy is a time commitment for the patient. Exercises will need to be practiced at home on a daily basis in addition to regular appointments with a physical therapist.

## INCONTINENCE

Pelvic muscle weakness can be a cause of bowel incontinence. The puborectalis provides a ring of support around the anal canal. The levator ani connects to the sidewalls of the pelvic floor organs and funnel down the pelvis. If these areas become weakened or do not function properly, stool can slip through the musculature and out the anal canal.

Physical therapy can provide exercises to assist with strengthening the muscle. Physical therapy is a time commitment for the patient. Home exercises need to be practiced on a daily basis.