Bladder and Bowel Issues

for Kids

A Handy Guide for Kids 4-12 Years old

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Introduction

This book's primary purpose is to help young people (5-12 years old) who experience functional bladder or bowel problems that are not structural or anatomical in nature. It might be that the individual experiences loss of urine or feces during the day. It might be that the individual experiences constipation or difficulty starting the flow of urine. It might be that nighttime wetting is a problem. The bowel or bladder dysfunction is experienced by the young person- he/she is not consciously causing the dysfunction.

A second purpose of this book is to provide parents with information and intervention suggestions for the bladder or bowel dysfunction their young person experiences. Chapters eight and nine describe a straight-forward goal-directed plan of action for various dysfunctional patterns. Using the interventions in conjunction with advice from a health care professional the parent and young person can experience control and success, often for the first time.

A third purpose of this book is to provide useful information for medical professionals dealing with young people experiencing bladder and bowel dysfunction. The suggestions in this book are meant for consideration after a complete and appropriate workup has eliminated structural or pathological conditions.

Childhood bladder and bowel dysfunction is a major medical problem after the age of four. The Diagnostic and Statistical Manual 4th edition considers bowel and bladder dysfunction as a diagnostic category in children by five years of age based on brain and body maturation. Approximately twenty percent of all pediatric visits to physicians are for incontinence problems. Fifteen percent of visits to gastroenterologists are for lower bowel dysfunction. Three percent of visits to pediatricians are for constipation. Five million youngsters complain of nocturnal enuresis (nighttime bedwetting).

Bowel or bladder dysfunction is not a main component of any specific psychological condition yet there may be an increased incidence of emotional disturbance. In school-age youngsters it can lead to isolation, depression, shame and embarrassment. Family dynam-

ics often change when a youngster experiences a bladder or bowel problem.

For Parents

This book includes a story for children about Bobby Bladder and Carrie Colon to explain dysfunctional voiding in understandable terms. The illustrations can be colored by the child to reinforce learning. The parent can read the story to the younger child. The older child can read the story to the parent. Parents can ask their child questions about his/her problem based on the story. The story suggests lifestyle changes and exercises that the parent and child can initiate under the guidance of a medical professional.

Following the story of Bobby Bladder and Carrie Colon is a chapter with older children's stories of bladder and bowel dysfunction. This chapter is designed to provide parents and older children ages 8 through 14 years old-with information about similar bowel or bladder problems. It is important to know "I am not alone".

Chapter one includes important general information for parents about bladder and bowel dysfunction. Basic definitions, subcategories of bladder and bowel problems, and frequency data provide the language for parents to communicate with medical professionals. Factors associated with bladder and bowel dysfunction are also outlined.

Chapter two describes the developmental sequence of bowel and bladder control from infancy to adulthood. Chapter seven outlines the basic anatomy and function of the pelvic muscles and bladder and bowel systems. Chapter eight includes a description of the exercises and training techniques to improve function of the bladder, bowel, and the pelvic muscles that support those organs.

Chapter nine describes step-by-step bladder and bowel training. Chapter ten includes forms that can be used for keeping a record of the steps in training, the exercises completed, and the young person's bladder and bowel patterns.

Chapters five and six are written for the clinician. Chapter five describes types of dysfunctional voiding. Chapter six outlines a medical assessment, special questions, medical tests and medications. These chapters are written in more technical terms and are not essential for a parent to read. A reference list provides additional

reading on specific topics and appropriate children's books.

To get started read the children's story and then proceed to the chapters describing the developmental sequence of bowel and bladder control and anatomy and function. Finally continue to the program training chapter and begin the program with the assistance of a medical professional.

For Clinicians

Clinicians will find useful information about functional bowel and bladder problems in children 4-14 years old. Introductory information is found in chapter one. Chapter two describes normal bowel and bladder function. Chapter five describes characteristics of dysfunctional voiding categories and subcategories as well as statistics, and urodynamic characteristics for each category of dysfunction. Chapter six outlines medical assessment, medical tests and appropriate medications.

Anatomy, neurology and function of the bladder, bowel, and pelvic muscles are detailed in chapter seven. Therapeutic and behavioral intervention strategies are included in chapters eight and nine.

The chapters designed for parents and children (chapters 1 through 4) can be used by clinicians for education and treatment planning. Included are forms for data collection and goal reinforcement (chapter 10). A reference list provides additional reading on specific topics of dysfunctional voiding. Product information is available following the reference section.

Chapter 1

General Information

Bladder and bowel dysfunction can take many forms but they can often be grouped into a few categories.

Bladder dysfunction is defined as the involuntary loss of urine during the day and/or night in a child 5 years or older in the absence of congenital or acquired deficits. Nocturnal enuresis is nighttime bedwetting. Daytime wetting can be grouped into three general categories based on the severity of wetting. Group one is defined as experiencing damp underwear but outer clothing is not affected. Group two is defined as experiencing wetting enough to dampen the outer clothing with a visible wet area. Group three is defined as experiencing a wet puddle in shoes, on the floor or chair. Most youngsters fit in group one or two.

Types of daytime wetting can also be defined by what stimulates the leaking. Urge incontinence is leaking with a sudden urge feeling that occurs only seconds before the uncontrolled release of urine. Stress incontinence is leaking with physical activity, coughing, or sneezing, any activity that increases intra-abdominal pressure. Giggle incontinence is sudden and complete uncontrolled bladder emptying during laughing or giggling.

Secondary incontinence is leaking with a sudden infection or illness (urinary tract infection or cancer). Careless incontinence is leaking when the youngster does not take time to toilet while playing or attending school.

Daytime wetting occurs in approximately 1% of girls and .5% of boys 4-7 years of age. Nighttime bedwetting occurs in approximately 15%-20% of 5 year olds and 5% of 10 year olds. One to two percent of 15 year olds still experience nighttime bedwetting an average of two nights per week.

Factors that are associated with bladder dysfunction include:

family history
delayed physical maturation
decreased functional bladder capacity
urinary tract infections
constipation
toilet training practices
sleep disturbances
diet
hormonal irregularities
stressful situations

A family history of nighttime bedwetting is common. Seventy percent of youngsters with this problem have a parent or sibling with the same problem. Genetic twins are approximately twice as likely to experience wetting as non-identical twins.

Delayed physical maturation becomes a factor when ambulation does not occur in the normal developmental sequence or age range. The pelvic muscles required for continence are the same that provide stability and rotation through the hips enabling a child to walk.

Decreased functional bladder capacity is associated with frequency and urgency during the day. The youngster will toilet more often than other children of the same age and eliminate less urine during each toileting episode.

Urinary tract infections (UTI) are commonly associated with leaking, frequency and urgency, as well as pain during toileting. As many as 50% of girls with daytime wetting problems have UTIs.

Constipation can irritate the bladder (from the enlarged bowel) by pressing on the bladder and by causing irritation to the nervous system that controls the bladder and bowel. Daytime or nighttime wetting can be the result of constipation.

Toilet training practices can create excess anxiety over toileting locations, frequency, or acceptability. If too frequent toileting is reinforced on a scheduled basis the youngster may not develop the recognition of the natural sensation of fullness. If toileting only at home is reinforced the young person may learn dysfunctional holding patterns.

Sleep disturbance can affect the level of sleep during periods of the night. This can lead to short deep sleep cycles with the inability to wake to the messages of a full bladder.

Dietary habits can include food or drink that are irritating to the bladder or foods that have diuretic properties (increase fluid transfer from the body to the bladder). Youngsters who have wetting problems are often told to avoid teas, coffee, chocolate, sodas, and citrus juices. Foods with diuretic properties include melons, cucumbers, and asparagus. It is important that youngsters drink adequate fluid each day. An 8 ounce glass of liquid at each meal and a glass between each meal is usually adequate.

Hormonal or biochemical irregularities can be linked to wetting. Some hormones affect the body's ability to transfer fluid from the body to the bladder. Increased fluid transfer at night can lead to nighttime bedwetting. Attention deficit disorder is often accompanied by hormonal or biochemical irregularities and associated with day and nighttime leaking. Diabetes is associated with insulin deficiency and associated urinary frequency.

Stressful situations are often linked to bladder or bowel dysfunction. Children have been known to regress in the their toileting skills during times of stress such as during a divorce, a major illness of a parent, or a new baby in the household. Regression is often seen at the beginning of school, moving to a new city or a new neighborhood, or beginning a new activity like piano lessons, a soccer or swim team, or a new social, religious, or volunteer group.

Bowel dysfunction is defined as constipation, staining or soiling underwear with feces after 5 years of age. A more specific definition of constipation is having bowel movements less than 3 times per week that require straining to push out because of hard consistency. Staining or soiling underwear with feces occurs with excessively soft stools, poor control of the anal sphincter muscles, retention of stool with secondary overflow soiling, or mental distractability. Three to five percent of youngsters over 5 have bowel dysfunction at some time in childhood.

Bladder and bowel dysfunction affects the youngster and the family in emotional terms. Parents often feel helpless, guilty, or anxious. Parents question their parenting skills. Tension around the

dysfunctional behavior carries over to family dynamics. Self esteem is affected in youngsters who experience chronic bladder or bowel problems. They feel "different" and distant from others their age. The youngsters with bladder or bowel dysfunction are on constant alert to prevent being "discovered" by friends while at the same time often denying the extent of the problem. They will often isolate themselves refusing to participate in overnight outings, sporting events or social gatherings.

Chapter 2

Normal Bladder and Bowel Function

Normal Milestones

Normal milestones of bladder function include:

Newborn	Reflex voiding up to 20 times/day
Six Months	Bladder volumes increase Voiding frequency decreases
One to Two Years	Conscious sensation of bladder filling Increased bladder capacity Voluntary sphincter control Voluntary control of voiding reflexes
Two to Three Years	Voluntary control of voiding
Four Years	Adult pattern of voiding Every 3-4 hours daytime Sleep through the night

Normal milestones of bowel function include:

Newborn	Four stools per day during first week
Two Years	1.7 stools per day
Four Years	1.2 stools per day

Note: Breast-fed infants may go as long as 2-3 weeks without a bowel movement and not be constipated. Soft, non-formed stools are normal with breast-fed babies.

The majority of children have a bowel movement at least every other day after the age of three.

The normal sequence of control is usually: nighttime bowel control, then daytime bowel control, then daytime bladder control, then nighttime bladder control.

Normal Bowel Movement

Normal bowel movement occurs in the following sequence:

A bowel movement enters the lower bowel. Its presence and the sensation of fullness is sent to the brain where it is registered as a "need to have a bowel movement".

The pelvic muscles relax when approximately 2/3 cup of stool or more enters the lower bowel. The bowel movement then moves to the lowest part of the bowel, the anal canal, where it is registered in the brain as "urgency to have a bowel movement".

If it is not appropriate to have a bowel movement immediately the pelvic muscles tighten to maintain the bowel movement in the anus until it is safe to toilet. When it is appropriate to have a bowel movement, the pelvic muscles relax and the bowel movement is emptied.

The bowel emptying occurs through bowel muscle contraction aided by gravity and abdominal muscle tightening (straining). Abdominal muscle tightening is minimal unless there is a hard stool. During the day and night bowel continence is achieved by continuous resting tone of the pelvic muscles maintaining closure of the anus.

Normal Urination

Normal urination occurs in the following sequence:

Urine enters the bladder and the presence of urine is picked up by sensory nerve endings in the bladder muscles as they are stretched from the increasing volume of fluid. The sensation of fullness is transmitted to the brain where it is registered as a "need to urinate".

If it is not appropriate to urinate immediately the pelvic muscles tighten to maintain the urine in the bladder until it is safe to toilet. When it is appropriate to urinate, the pelvic muscles relax and the urine is emptied.

The urine is emptied through bladder muscle contraction aided by gravity. Abdominal tightening is not necessary for normal bladder emptying. During the day and night bladder continence is achieved by continuous resting tone of the pelvic muscles maintaining closure at the bladder outlet.

A Day in the Life of Bobby Bladder and Carrie Colon

A Story for Children

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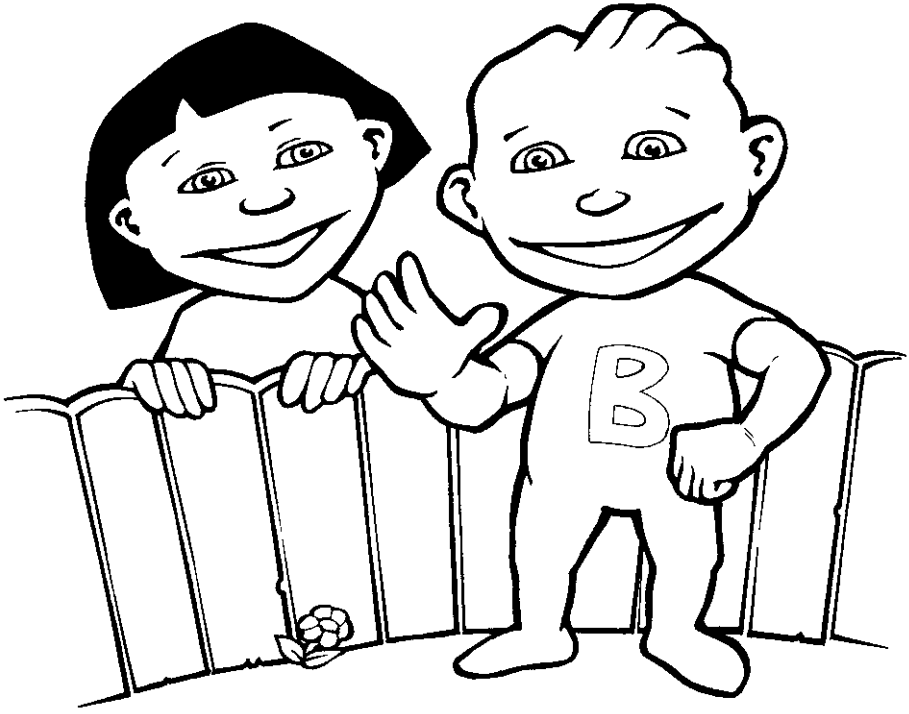


This is the story of Bobby Bladder and Carrie Colon. Bobby Bladder and Carrie Colon are friends. They live next door to each other inside your body and they live in everybody's body. They take the leftovers from what you eat and drink out of your body. Your bladder takes liquid out of your body and it is called urine, pee or number one. Your colon takes solids out of your body and it is called bowel movement, poop, or number two.

Sometimes friends get along and play well together, but sometimes they disagree. When Bobby Bladder and Carrie Colon are not getting along, it makes them unhappy, and that can make you unhappy. Luckily, there are easy things you can do to help Bobby Bladder and Carrie Colon get along and be happy.

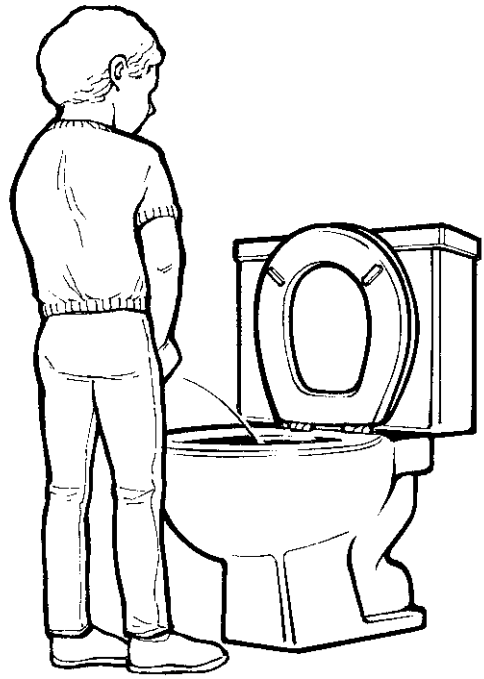
Billie Brain lives in your head and has fast telephone lines so he can talk to his friends Bobby Bladder and Carrie Colon.

Bobby Bladder and Carrie Colon must talk to and listen carefully to Billie Brain so they can know when to go to the bathroom to toilet. Some foods and drinks make it hard for Billie Brain, Bobby Bladder and Carrie Colon to talk together. Sodas or pop, hot chocolate, tea and coffee, orange and grapefruit juice can confuse messages between Bobby Bladder and Billie Brain. The telephone lines work best when you drink water.

Sometimes Bobby Bladder tells you he needs to go to the potty. The feeling can be a full tummy, a tight bottom or a feeling of pressure around your bottom. If Billie Brain knows you have to wait he uses his telephone lines to send messages that help Bobby Bladder hold on until you can make it to the potty. When Bobby Bladder gets too full it makes him grumpy and he spills the liquid inside him out. That liquid is called urine. This gets your pants wet, yucky and cold.

One way to make sure that Bobby Bladder does not get too full is to go to the potty whenever you have the full, tight or pressure feelings in your tummy or bottom. Another way is to go potty every 2-3 hours (you can ask a grownup to help you know when to go and empty Bobby Bladder). When you go to the potty often, Bobby Bladder stays happy and you can run and jump and play, and not spill. It is kind of like trying to run and jump and play with a really full glass of water- some of the water will spill out.

If you pour some of the water out, you can run and jump and play without spilling.



When you go to the potty the water runs out.

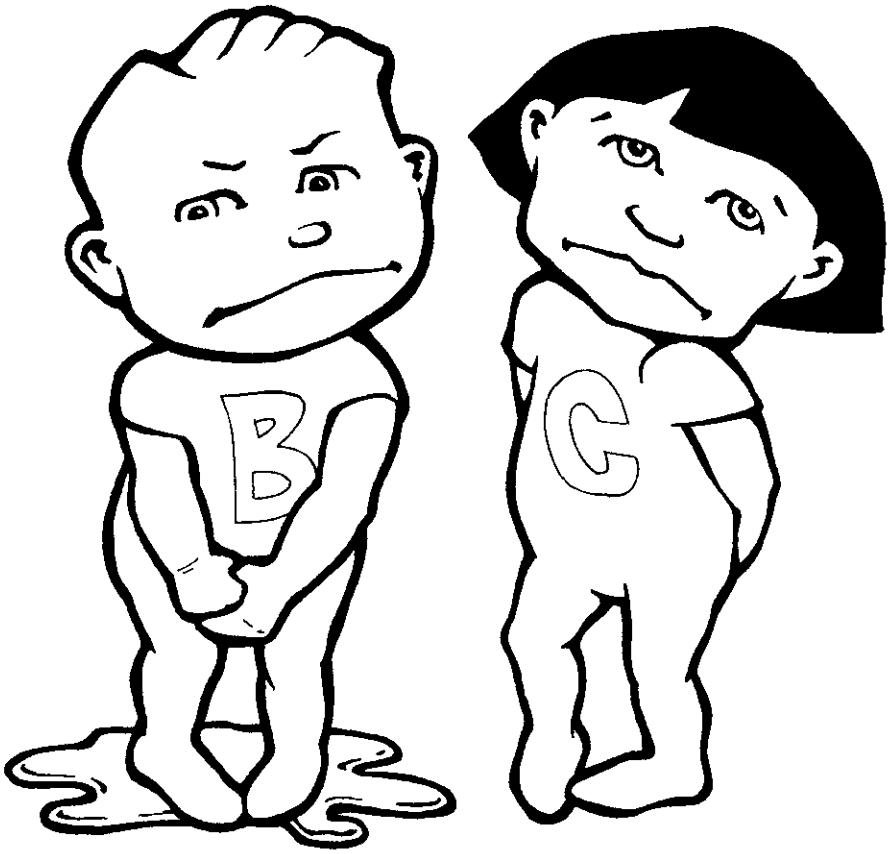
When you are a little baby Billie Brain and Bobby Bladder do not know how to help hold urine from spilling out. When you get older Bobby Bladder learns to tell Billie Brain it's time to toilet. They learn how to hold urine in until you can get to the bathroom. Bobby Bladder has to learn how to hold the urine in, he also has to learn how to let the urine out when he gets to the potty.

One day, Billie Brain asks Bobby Bladder a question. "Bobby, do you know how to let the urine out when you get to the potty?" "Yes," says Bobby Bladder. "I am a strong muscle. Before I get to the potty, I hold onto the urine so I will not spill. When I get to the potty and it is time to let the urine out I relax and let it out. It is kind of like pulling the plug when bath time is over. The bathtub is like me, holding in the water. When the plug is pulled up, the water goes down the drain." "That is right." says Billie Brain.

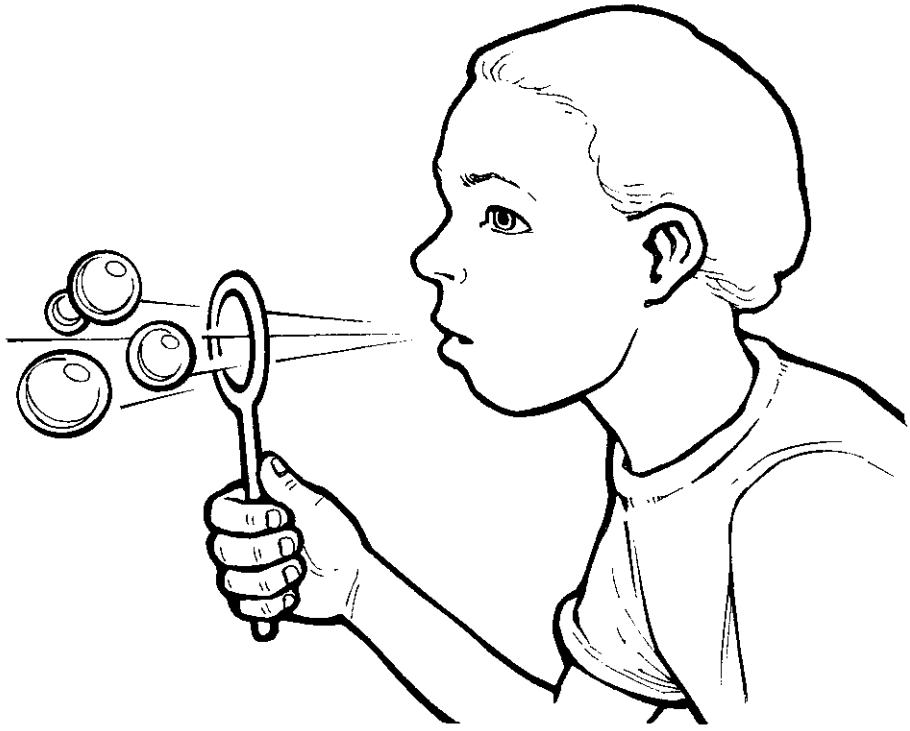
Bobby Bladder has another neighbor and his name is Tommy Tummy. Tommy Tummy helps you to run and jump and play. He likes to play with Bobby Bladder.

Billie Brain asks, Bobby Bladder, "Does Tommy Tummy have to help hold urine in when you are playing or push it out when you go to the toilet?" "No," says Bobby Bladder. Tommy Tummy is a bigger stronger muscle than Bobby Bladder. When Bobby Bladder tells Billie Brain that he is getting full Tommy Tummy's bigger, stronger muscle sometimes tries to hold the urine in by getting tight.

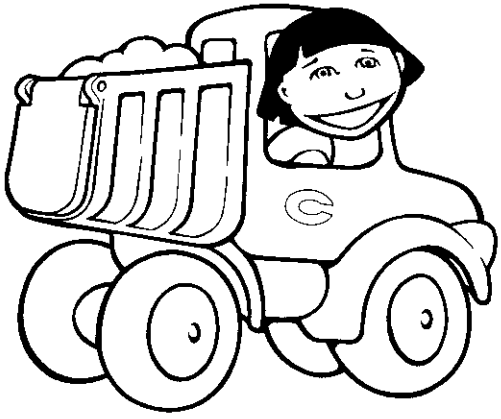
That does not work and instead the urine leaks out. When Tommy Tummy muscle tightens or pushes too hard on Bobby Bladder urine leaks out. So it is important that Tommy Tummy stays relaxed. When Tommy Tummy gets excited and pushes too hard urine leaks out.

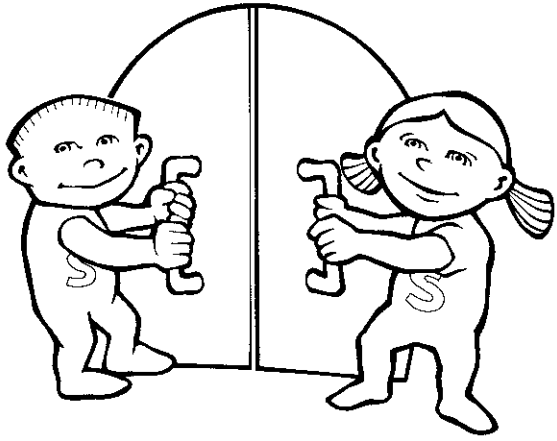


Sometimes Bobby Bladder and Carrie Colon are having so much fun playing that they do not listen to Billie Brain saying "It is time to go to the toilet." When Bobby Bladder and Carrie Colon do not listen to Billie Brain it can make Bobby Bladder spill and make your pants wet and yucky and cold.

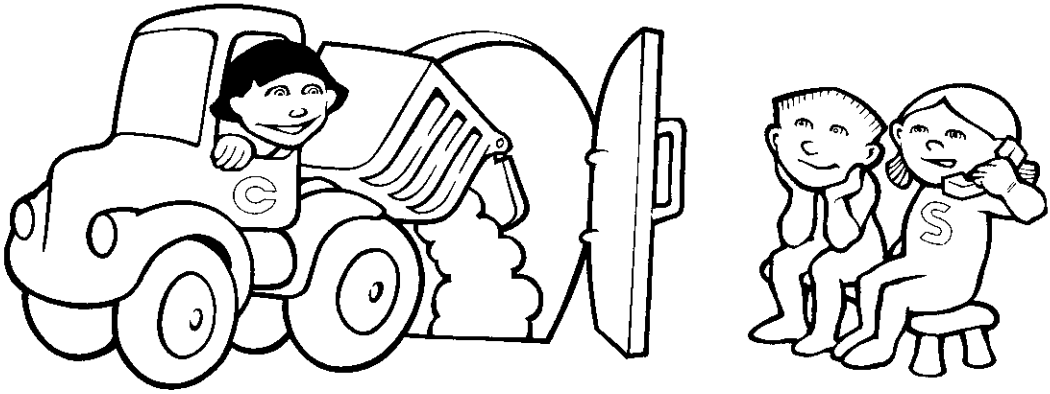


One way to make sure that Bobby Bladder does not spill is to teach Tommy Tummy to relax when it is time to go to the bathroom. When Tommy Tummy stays relaxed, even when running, jumping and playing, then Bobby Bladder has time to make it to the potty without spilling any urine. Tommy Tummy can relax if you blow out like blowing bubbles or blowing dandelion seeds.



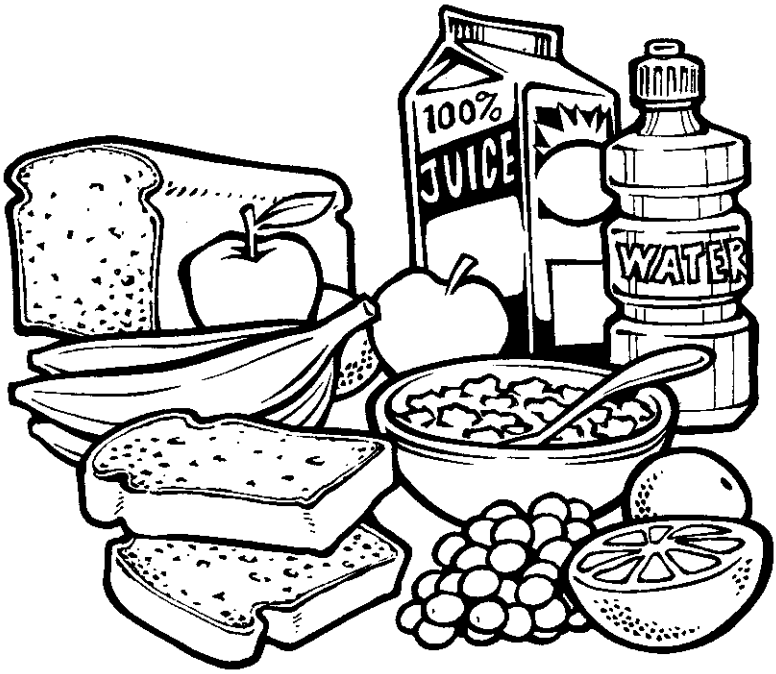


When you eat food your body uses most of it to give you energy. There is some left over that your body cannot use and Carrie Colon takes the left-over food and makes it into a Bowel Movement, a B.M., sometimes called poop. Carrie Colon has two friends, Sal and Sally Sphincter, who keep the poop inside your body until you can go to the potty and let it out.



Carrie Colon is like a dump truck. When she is full, Carrie Colon tells Billie Brain that she needs to dump her load. Billie Brain tells Sal and Sally Sphincter to take a rest break and let the poop out. Sal and Sally Sphincter have to be comfortable so they can relax. It is important that you are comfortable on the potty so that Sal and Sally Sphincter can relax and let the poop out.

Sometimes Carrie Colon's truck is full but something goes wrong and Sal and Sally Sphincter do not relax and let the poop out. When this happens, the poop stays in Carrie Colon and gets dried out and hard like rocks. Then the poop is too dry and hard and it does not come out even when Sal and Sally Sphincter are relaxed. You have to push hard to get the poop out and that can hurt you and Sal and Sally Sphincter very much.



It is important to fill Carrie Colon's dump truck with foods that will help her make soft poop. She needs fiber, which is like a dry sponge that needs water to make it soft and squishy. Foods that have fiber in them are fruits, vegetables, and whole grain cereal and bread. Can you name these good foods that help Carrie Colon make soft poop? Let's make a list of your favorites. Then you can share it with Mom and Dad.

The liquid that Carrie Colon likes best is water. To help you drink enough water to make Carrie Colon work well, make sure you drink a glass of water or other fluid with each meal and one between each meal.

My Favorites:

1. _____

2. _____

3. _____

4. _____

5. _____

Carrie Colon and Sal and Sally Sphincter must talk to and listen carefully to Billie Brain so they can make soft poop. Some foods and drinks make it hard for Billie Brain, Carrie Colon and for Sal and Sally Sphincter to talk together. When this happens, poop gets too hard and hurts when you try to push it out. Can you name some of the foods and drinks that make it hard for Billie Brain to talk with Carrie Colon and Sal and Sally Sphincter?

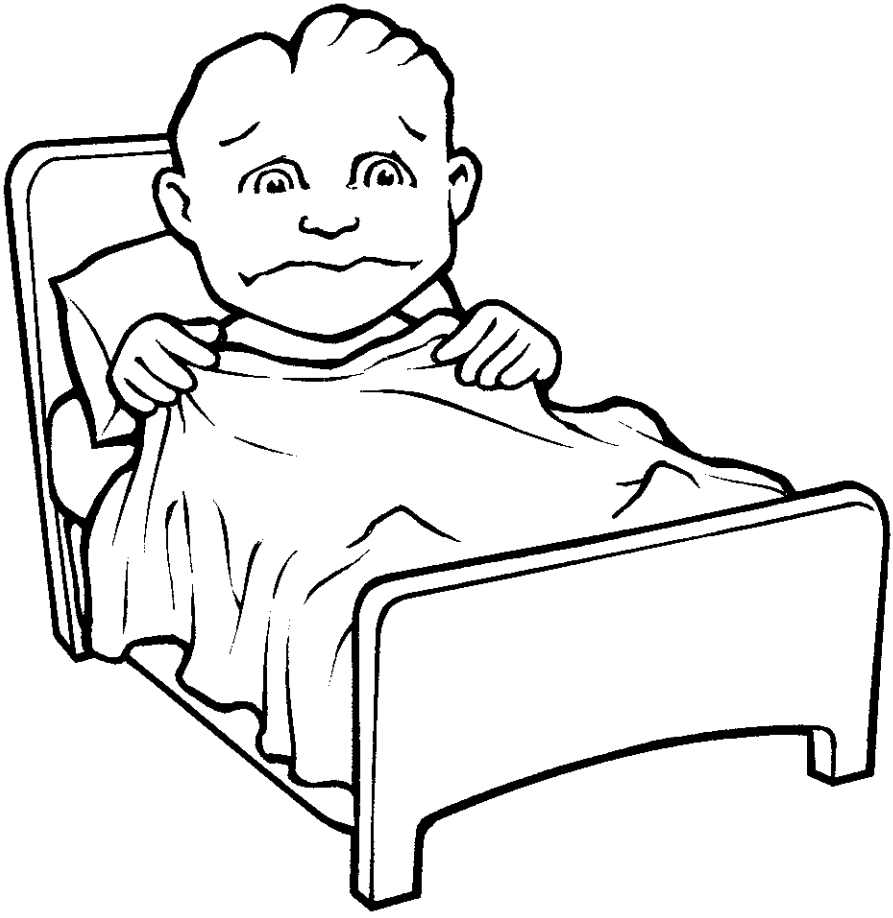
Playing outside, running, jumping and just plain walking everyday is really helpful for all your inner body-buddies. Billie Brain uses wonderful telephone lines to keep Bobby Bladder and Carrie Colon working together. You and your body-buddies can have lots of wonderful days if you balance all the things you do so everything works well.

It is important to practice good toileting habits with Bobby Bladder and Carrie Colon

- Go to the toilet regularly.
- Sit or stand so you are relaxed and comfortable.

Wipe, Woosh and Wash after every time you toilet.

When Bobby Bladder or Carrie Colon do not make it to the potty in time and your underwear and pants are wet and yucky it is important to tell your mother, father or another adult to replace the wet, yucky pants with dry ones. Remind Bobby Bladder and Carrie Colon to get to the potty next time by saying, "I can go to the toilet when I need to potty."



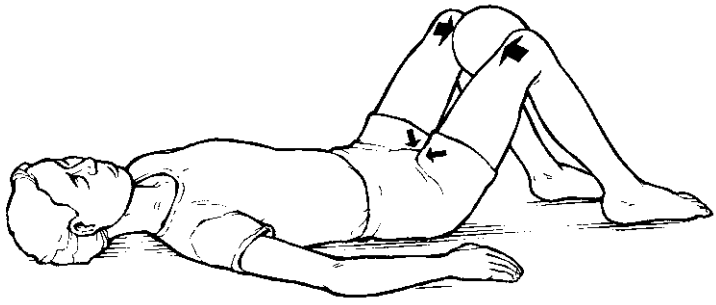
Sometimes when you are asleep Bobby Bladder lets go of urine instead of holding it and the bed gets wet. You do not do this on purpose. Sometimes when Bobby Bladder grows quickly, or gets sick, the telephone messages between Billie Brain and Bobby Bladder get mixed up and do not wake you up in time to go to the toilet. This problem usually goes away when you get older. Sometimes Mommy or Daddy had this problem when they were a little girl or boy.

When Bobby Bladder does not grow as fast as the rest of your body it cannot hold a night's worth of urine and you may wet at night. To stay dry through the night stop drinking 2-3 hours before bedtime. Take your time and relax while going to the bathroom before you go to bed. You want to make sure Bobby Bladder is empty when you go to sleep.

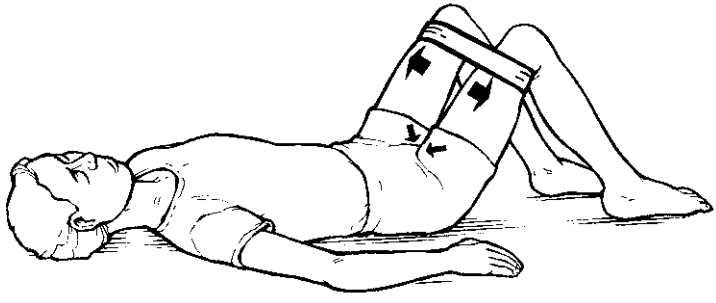
An alarm connected to a sensor in your underwear can wake you up when just a little urine has leaked out. Often this will allow you to make it to the bathroom to empty Bobby Bladder without making the whole bed wet.

Exercise is an important part of being dry during the day and at night. Exercise is an important part of having regular, pain-free poops. These 2 exercises are easy to do.

In your bed or on a carpet lie down with your knees bent. Then roll your knees in on a small soft ball and squeeze the ball while you count to 10 slowly. Be sure to breathe while you count to 10. Then relax while you count to 10. Do this 10 times.



The second exercise. Fasten an elastic band above the knees with the knees touching. Then roll your knees out against the band and hold while you count to 10 slowly. Then relax while you count to 10. Do this 10 times.



Chapter 4

Young People's Stories of Bladder and Bowel Dysfunction

Linda's Story

Linda, an 8 year old active young person, lives with her parents and 3 brothers and sisters. Her mother describes problems with day and nighttime leaking on a daily basis. She usually arrives home from school with wet underwear. During after-school dance classes she frequently leaks enough to have to change her tights and underwear. She experiences nighttime leaking 3-4 nights per week. Linda has a bowel movement (of soft consistency and without straining) every 1-2 days. Linda acknowledges that she doesn't notice when she needs to toilet but it bothers her to have wet underwear. She states it is embarrassing when she has to leave dance class to change her tights. At night she sleeps through the wetting episodes and wakes up in the morning with the sheets and pajamas wet. Linda was toilet trained by 3 years old for bladder and bowel. She has always had occasional nighttime bedwetting. The daytime problem became noticeable when Linda started kindergarten. Linda's teacher describes her as an active, inquisitive youngster who becomes intensely interested in learning tasks. The classroom is arranged into learning centers so Linda is going from one learning center to another during the day alternating sitting at a desk and standing during the learning tasks. Her teacher will let her go to the toilet at any time if she asks.

Brian's Story

Brian, a 9 year old young person, lives with his parents in a small rural community. He attends school, plays baseball, and helps with chores on the farm. His father describes nighttime bedwetting problems that have been present since Brian was 3 or 4 years old. He was toilet trained by 4 years old but always had occasional night time wetting. Now Brian wants to travel to tournaments with the baseball

team and the bedwetting is interfering with overnight travel. Brian's father describes having bedwetting problems as a youngster until he was about 12 years old. Brian describes sleeping well but waking in the middle of the night with his pajamas wet. If he is very tired he may sleep through the wetting and wake in the morning to wet sheets and pajamas. He has tried waking up to an alarm in the middle of the night to toilet but that has not solved the problem. Brian toilets during the day every 3-4 hours and has a bowel movement daily.

Molly's Story

Molly, a 12 year old athletic young person, describes bowel movements that are so large they frequently plug up the toilet. She has bowel movements every 1-2 days. The bowel movement is usually soft but occasionally it becomes hard and she must strain to empty. Molly has occasional wet underwear during the day. She experiences nighttime wetting 1-2 nights per week. Molly is an A student and an accomplished swimmer as well as a musician. She describes minimal perception of an "urge" to toilet, either for bladder or bowel. "Too busy with other things", she responds when asked why she may be having accidents. She was toilet trained by 3 years old but had occasional accidents day and night.

Jenny's Story

Jenny, a 14 year old self-described bookworm, experiences dribbling leaking after toileting. She toilets every 3-4 hours and feels she completely empties her bladder when she toilets. She also describes several vaginal yeast infections as well as redness and sensitivity around the perineal area. She likes school, movies, and books. She does not participate in athletics. She has problems maintaining a normal weight and is presently working with Weight Watchers with a goal to lose 20 pounds. Jenny's mother was asked to observe Jenny's position on the toilet. Jenny sat on the toilet with her toes resting on the floor, legs together and leaning back towards the toilet tank.

Michael's Story

Michael, an 8 year old self-described computer game afficionado, experiences uncontrolled day time stool loss. The loss of stool occurs

2-3 times per week. His mother describes his bowel patterns as every 2-3 days with firm to hard stools. His teacher and mother describe noticing the odor before Michael becomes attentive to the fecal soiling problem. When asked if he needs to toilet he is cooperative but claims to be unaware of the previous need to toilet. Michael is an average and interested student. He does not participate in any physical activities outside of school gym and is overweight. He spends after-school hours on the computer or watching television and says he does not notice any urge to have a bowel movement. His typical breakfast is sugared cereal and milk, lunch is a peanut butter and jelly sandwich, potato chips and pop. His after-school snack is cookies and Kool aide, his dinner is often hamburger and fries. He and his mother are concerned because he is losing friends and his grandparents do not want him staying overnight unless he has bowel control.

Jason's Story

Jason, a 10 year old boy with Down's Syndrome, attends public school. He could be in a regular classroom with an aide but is in the resource room because he is bowel and bladder incontinent day and night. He uses adult protective pads that the teachers and parents change. Many of the other resource room students have emotional control problems and are larger than Jason. He is often on the receiving end of emotional and physical outbursts. His parents have tried toilet training several times without success but are very concerned that he is still in the resource room at school.

Laura's Story

Laura, a 14 year old young woman, dreams of becoming a model and clothing designer. She is always in style with her dress, makeup and hair. Since the age of 12 she describes having diarrhea when she eats any type of food. She is afraid to be out in public after eating because of the explosive diarrhea that does not give her adequate warning to get to the bathroom. She describes drinking cola and eating 1 or 2 small soda crackers during the day so she can go to school, participate in gym and have a social life. On the weekend she stays home one day and eats whatever she wants but must stay close

to the bathroom all day. She is losing weight and complains of fatigue.

Benjamin's Story

Benjamin, a 12 year old young man, was born with spastic type of cerebral palsy primarily affecting the lower limbs. He uses a walker during ambulation. He was toilet trained by 5 years old after he began walking at 4 years of age. He occasionally has accidents if he misses a scheduled time for toileting or if the bathroom is too far away at the time of his scheduled toileting. Benjamin uses a vibrating watch to remind him when it is time to go to the bathroom. He also schedules his fluid intake to precede the toileting time by approximately 1 hour.

Chapter 5

Bowel and Bladder Dysfunction

Gastrointestinal Dysfunction

Gastrointestinal dysfunction includes the categories of constipation, functional retention with overflow soiling, functional non-retentive fecal soiling, anorectal malformations, spinal problems, Hirschprung's disease, sphincter damage, irritable bowel syndrome, and Chron's disease.

Constipation is characterized as having a bowel movement less than three times per week, a hard solid bowel movement that requires straining to eliminate. Causative factors include diet, irregular habits, endocrine disorders, or medications. Factors associated with chronic constipation include obstructed defecation, pelvic muscle dysenergia, and non-relaxing puborectalis contraction.

Functional retention with overflow soiling is defined as infrequent passage of large stools with liquid and pieces of bowel movement expelled with gas or muscle fatigue. It is also termed fecal soiling. Liquid stool from higher in the colon leaks past hard stool to stain underwear and leave small amounts of fecal material in the underwear. The sequence is often that there is an initial incidence of a painful passage of hard stool that then leads to the voluntary withholding of a bowel movement for fear of more pain. The rectum enlarges to accomodate more stool and the feeling of urge to defecate decreases. More water is absorbed as the stool is in the colon for longer periods. This leads to hard stool, increased pain and straining, and longer times between bowel movements. The colon can increase in size to as much as ten times normal before the urge to defecate is perceived.

Functional retention is diagnosed using the criteria of: 1.) passage of enlarged stools, and 2.) defecation avoidance through pelvic floor tightening, gluteal holding, and retention posturing. Retention patterns in infants include back and leg extension patterns and gluteal and anal muscle tightening.

In the toddler it can include the child rising up on toes, stiffening legs, wiggling or fidgeting while holding onto furniture. In the older youngster leg stiffening and buttocks tightening is common. The fear of discomfort and pain with a bowel movement is a primary factor in the holding posture.

Associated symptoms of functional retention include urinary urgency, frequency, leaking and infections. Urinary urgency, frequency or leaking can be secondary to the pressure of the enlarged rectum. Urinary tract infections are often secondary to the fecal soiling. Irritability, abdominal cramping, and decreased appetite are also secondary symptoms.

Functional retention is the most common bowel complaint in children, accounting for 3%-5% of visits to pediatricians. Onset of symptoms often occur after a change in routine or at developmental transitions. For example symptoms may first appear when an infant is changed from breast milk to formula, during toilet training, after an illness, vacation or change in eating habits, or when the young child first goes to school and is expected to sit at a desk and inhibit the urge to toilet until recess.

In the older child functional retention can take the form of large toilet clogging bowel movements even though they are soft, formed and occur daily. The size of the stool indicates excessive accumulation of feces in the bowel and is characteristic in the child that feels the urge to toilet but puts it off as less important than school work, athletics or socialization. Associated day or nighttime urinary leaking is common and responds well to a bowel program. Colon fullness is assessed through abdominal palpation.

When the symptoms persist for a long period of time there are emotional sequelae. School age children express negative self image, poor self esteem, and social withdrawal. They are secretive about the problem believing they are the only ones with discomfort and constipation. Denial is often used as a coping mechanism. The youngster hides soiled underclothing and claims to be unaware of the odor from fecal soiling.

Functional non-retentive fecal soiling is defined as voluntary or involuntary elimination of small, medium or large bowel movement in the underwear or in other inappropriate places at least once a week by youngsters more than 4 years old. There is no associated

structural or inflammatory condition, constipation, failure to thrive or abdominal pain.

There may be a tendency for the young person to neglect or "block out" the stimulus to have a bowel movement. In a minority of cases there can be a mental health disorder that needs to be addressed. Urinary leaking day or night accompanies this diagnosis 40%-45% of the time. Ten to twenty percent of defecation problems are due to functional non-retentive fecal soiling. One to three percent of children older than four can experience this problem.

Anorectal malformations are defined as congenital defects of the lower rectum, urogenital tract or anus. Fistulas can occur into the urinary tract or vagina at three levels: above the level of the puborectalis muscle, at the level of the puborectalis muscle or below the puborectalis muscle. The puborectalis muscle, its position and function at the anorectal malformation, is often evident within 72 hours of birth because of signs/symptoms of intestinal obstruction or fistulas. An intestinal obstruction is a blockage. A fistula is an abnormal opening or connection between two structures. A discharge of meconium(a fetal bowel movement) from the perineum, scrotum, vagina, or urethra is indicative of a fistula. No meconium is indicative of a covered or imperforate anus.

Spinal problems resulting in a neurogenic bladder include spina bifida, myelomeningocele, tethered cord, transverse myelitis, and spinal cord injury with resulting paralysis and loss of sensation below the lesion level.

As the youngster grows, the nerve roots can become retethered (scarred down) resulting in new bowel and bladder symptoms. Spina bifida or myelodysplasia is a defect in the formation of the spinal column and meningomyelocele is herniation of the spinal cord and membranes through that defect. The lumbosacral area is the most common area of lesion. There is resultant bowel and bladder dysfunction. The rectoanal inhibitory reflex is preserved but the urge to defecate is lost. If the external anal sphincter is paralyzed there is constipation. There can be diarrhea or small ribbon-like stools.

Hirschsprung's syndrome (congenital aganglionosis) results in abnormal passage of stool leading to constipation, abdominal distention, and vomiting caused by inadequate enteric innerva-

tion to the lower bowel. The inadequate innervation of the lower bowel leads to ineffective colon contractions and accumulation of feces in the rectum. Secondary problems include a megacolon and at the extreme a ruptured colon.

Sphincter damage is from severe perianal trauma, penetrating or impalement injuries or sexual abuse.

Irritable bowel syndrome (IBS) is characterized by alternating constipation and diarrhea, flatulence, and abdominal discomfort. Visceral hypersensitivity leads to increased speed or intensity of gut contractions or decreased water or nutrient absorption rates due to enteric nervous system dysfunction. Chron's disease is characterized by a chronic and long lasting ulceration of a section of the intestine. When the inflamed parts heal the resultant scar tissue narrows the passageway. If the inflamed part does not heal a resection to remove the diseased tissue is required. Obstructions, fistulas (abnormal pathways between two parts of intestine or organs) and chronic bleeding can lead to infection, pain, diarrhea, nausea, and vomiting.

Bladder Dysfunction

Dysfunctional voiding is characterized by daytime leaking, voiding frequency, dysuria, constipation, and recurrent urinary infections. It is a diagnosis of exclusion. A thorough assessment eliminates confounding diagnoses of neurogenic bladder, infection, posterior urethral valves, bladder/urethral masses or any physiological problem. Dysfunctional voiding includes subcategories of hypertonic bladder, bladder hyperreflexia, lazy bladder, vaginal voiding and Hinman's syndrome.

Hypertonic bladder symptoms include recurrent bladder infections, frequency, urgency, and urge incontinence. There is often staccato voiding(pulsed urine release) and incomplete emptying due to pelvic muscle/sphincter dysfunction.

Bladder hyperreflexia symptoms include frequency, urgency and sudden leaking. The child often crosses his/her legs and puts the heel into the perineum in an attempt to prevent leaking. Urodynamic testing indicates uninhibited bladder contractions with secondary pelvic muscle contraction in an attempt to maintain continence.

Lazy bladder is described as holding urine for a prolonged period of time. Urodynamic testing finds a compliant bladder with an

unsustained contraction or absence of bladder wall contraction when the bladder is full.

Vaginal voiding symptoms include dribbling urine upon standing after voiding, external perineal irritation, itching and redness and vaginal yeast infections. Seen most often in heavy set young girls, it is a mechanical problem. The young girl sits on the toilet with her feet poorly supported, legs together, and trunk leaning back towards the toilet tank. During toileting the urine runs backward into the vagina instead of forward and out. This results in irritation of the perineal tissue and when the young girl stands up the urine dribbles out from the vagina.

Corrective action includes prompting the young girl to remove pants and underwear down to the ankles, relax legs apart, lean forward with the pelvis pushed forward and elbows resting on her thighs. If that does not solve the problem she can sit backwards on the toilet, facing the toilet tank, legs straddling the toilet bowl and resting her arms on the tank.

Hinman's syndrome includes symptoms of day and night bladder and bowel incontinence and recurrent urinary tract infections. Urodynamic testing finds ineffective detrusor contractions, active contraction of the external sphincter during voiding, and intermittent urine flow.

Nocturnal enuresis (nighttime bedwetting) is described as uncontrolled loss of urine during sleep after control is normally present. Primary nocturnal enuresis is defined as never being totally dry for greater than 6 months after toilet training. Secondary nocturnal enuresis starts at least one year after being dry and usually has a psychological component. Daytime dysfunctional voiding can lead to nocturnal enuresis so it is important to ask about and treat daytime dysfunctions even when the presenting complaint is night time wetting. In this type of nocturnal enuresis the child accumulates urine during the day not emptying the bladder completely or regularly. At night during sleep the bladder releases large amounts of urine, often more than once during the night. Until this young person is practicing timed voiding during the day the nocturnal enuresis will continue to be a problem. In other cases the young person may sleep through the loss of urine or may wake up wet. Nighttime wetting often runs in families and disappears at puberty.

Diagnoses with Bladder or Bowel Component

Bladder and/or bowel dysfunction can be a secondary component of a pediatric diagnosis. These diagnoses include attention deficit disorder (ADD), cerebral palsy (spastic, athetoid, or hypotonic), spina bifida (meningomyelocele), Down's syndrome, diabetes, spinal cord injury, Hirschsprung's disease, Chron's disease, anorectal malformations, perianal trauma including penetrating or impaling injury, and psychiatric disorders.

Attention deficit disorder is often related to bladder or bowel incontinence day or night. This incontinence is persistent until the ADD is treated, often with medications. Some medications used to treat ADD can make dysfunctional voiding worse.

Cerebral palsy (spastic, athetoid, or hypotonic) is related to bladder or bowel incontinence in approximately 30% of cases. Incontinence is more prevalent if the individual is not able to walk. If the child uses a wheelchair the energy and time needed to toilet transfer can preclude successful continence without an attentive caregiver. Children with cerebral palsy who use assistive devices to ambulate are often continent by 5 years old. If later in life the child decides to use a wheelchair for energy conservation incontinence becomes more prevalent. Youngsters with athetoid tone experience more bladder and bowel incontinence than those with spastic or hypotonic tone. Neurogenic bladder is common in cerebral palsy.

Spina bifida(myelomeningocele) is related to bladder and bowel incontinence depending on the involvement of the nerves innervating the bladder and bowel. Spina bifida occurs in approximately 1:1000 births. If the child is ambulatory there is an improved possibility of continence. As the youngster grows the spinal nerves that innervate the bladder and bowel may become tethered which can decrease the remaining innervation to the bowel and bladder so function can decrease with age. The energy and time needed to toilet transfer if the child uses a wheelchair can preclude successful continence without an attentive caregiver.

Down's syndrome and the related low muscle tone can lead to bladder and bowel dysfunction day and night. An increased incidence of Hirschprung's syndrome in children with Down's syndrome can be a complicating factor in bowel function. When the child learns to walk toilet training can usually be successful.

Spinal cord injury, congenital or acquired, is related to bladder and bowel incontinence due to interruption of nerve input to these organs. If the injury results in an incomplete lesion of the cord, partial or complete bladder or bowel control is possible. If the lesion is complete there is loss of sensation and paralysis below the lesion level. There can be fecal soiling, diarrhea or constipation depending on the reflexes still intact.

Hirschsprung's syndrome, decreased or absent nerve innervation to the lower bowel, can lead to constipation, abdominal distension, vomiting and megacolon. It can also affect bladder continence due to common innervation and approximation of structures. In severe cases surgery to remove the section of bowel that lacks nerve innervation is often performed in infancy.

Irritable bowel syndrome (IBS) is described as abdominal pain relieved by defecation, abdominal bloating, and alternating constipation and diarrhea. These symptoms occur in approximately 6%-14% of school-age children. Visceral hypersensitivity can lead to increased speed or intensity of gut contractions or decreased water or nutrient absorption rates due to enteric nervous system dysfunction.

Chron's disease is characterized by intestinal inflammation leading to diarrhea, abdominal pain and abdominal distension. The chronic inflammation with resulting scarring, bleeding and obstruction can be life threatening. The bowel and bladder dysfunction contributes to the severity of the symptoms.

Anorectal or urogenital malformation results in bowel and/or bladder dysfunction. Anorectal malformations, congenital defects of the lower rectum or anus including a covered or imperforate anus, and urogenital malformations, congenital defects of the urethra and external urethral sphincter can often be identified within several days after birth due to signs/symptoms of intestinal or bladder obstruction. These defects occur in 1:3000-5000 births. Fistulas, connections between the rectum, vagina, and urethra are noticed due to abnormal fluid excretion.

Perianal, perivaginal, or periurethral trauma can result in bowel and/or bladder dysfunction. Sphincter damage can be severe from penetrating or impalement injuries or sexual abuse.

Chapter 6

Medical Assessment & Medications

The components of a medical assessment for bladder and bowel dysfunction include a history, special questions, a bladder/bowel diary and special medical tests. The objective bladder/bowel diary data can be used as baseline data for functional improvement. It is more accurate than recollection data aquired during a history. The history and special questions provide a global picture of the bowel/bladder dysfunction in relation to the young person's developmental progression, socialization, family dynamics, and medical status. Medical tests are used to support or eliminate specific diagnoses and to facilitate effective treatment strategies.

Assessment Questionnaire - Bowel

Name_____ Date _____

Date of Birth_____ Age_____ Sex_____ School Grade_____

Parent/Guardian Name_____

Siblings Name & Age _____

_____

Primary Problem - Bowel

Describe the problem in your own words:

_____

_____

_____

When did the problem start: _____

_____

My problem occurs during: _____

Frequency of problem:

mark with an X if the item is answered yes.

❑ Day ____x/day, ____x/week, ____x/month

❑ Night ____x/night, ____x/week, ____x/month

Quality of Bowel Movement:

❑ hard ❑ solid/soft ❑ liquid

Shape of Bowel Movement:

❑ pellets/rocks ❑ ribbon-like ❑ round/firm formed

Fluid Intake:

# of 8-ounce glasses ___breakfast ___lunch ___dinner ___bed

Types of fluid:_____

❑ Uncontrolled Loss of Bowel Movement:

❑ staining of underwear ❑ solid stool loss

❑ liquid stool loss ❑ gas loss

continued next page ▸

❑ Constipation:

❑ strain with bowel movement ❑ pain with bowel movement
❑ laxative use ❑ enema ❑ feeling of incomplete emptying
❑ toilet plugging bowel movement

❑ Diarrhea:

❑ after eating _____frequency

❑ Associated Symptoms:

❑ nausea ❑ bloating ❑ belching ❑ vomiting ❑ indigestion ❑ appetite loss
❑ trouble swallowing ❑ full feeling after a few bites ❑ urine loss

Rationale for Loss of Control:

❑ fear of toilet/bathroom ❑ sudden urgency
❑ preoccupied so not responsive to signals
❑ unaware of bowel movement passage

Toileting Posture:

Describe position sitting on the toilet: (foot, knee, hip, and back positions)

_____

Underwear/Protection Used: _____

Impact of Bowel Problem on Daily Life: (circle one)

0 1 2 3 4 5 6 7 8 9 10

none moderate significant

What activities have changed:_____

_____

Medical History:

❑ Fecal impaction ___# in past year

❑ Serious Illness List: _____

❑ Surgery List:_____

❑ Developmental Delays List: _____

❑ Medications List: _____

❑ Family History: Mother_____ Father_____ Siblings_____

❑ Toilet Trained: Bladder at ___ yrs/old Bowel at __ yrs/old

Assessment Questionnaire - Bladder

Name_____ Date _____

Date of Birth_____ Age_____ Sex_____ School Grade_____

Parent/Guardian Name_____

Siblings Name & Age _____

_____

Primary Problem - Bladder

Describe the problem in your own words: _____

_____

_____

When did the problem start: _____

_____

My problem occurs during: _____

Frequency of problem:

mark with an X if the item is answered yes.

❑ Day ____x/day, ____x/week, ____x/month

❑ Night ____x/night, ____x/week, ____x/month

Urine Loss Amount: ❑ small (drops) ❑ medium (wet underwear) ❑ large (wet outerwear)

❑ Urgency to Toilet ❑ Extreme Urgency to Toilet

Location of Symptom Occurrence: ❑ home, ❑ school, ❑ other

Toileting Frequency:

Day: every ❑ hour ❑ 2 hours ❑ 3-4 hours ❑ 5 or more

Night: times/night ❑ 0 ❑ 1 ❑ 2 ❑ 3 ❑ other

Fluid Intake:

# of 8-ounce glasses ___breakfast ___lunch ___dinner ___bed

Types of fluid:_____

continued next page ▸

Urine Flow Characteristics:

❑ initiation hesitancy ❑ reduced stream flow ❑ pulsed/staccato flow ❑ strain/push to urinate ❑ pain with urination ❑ dribbling post urination

Rationale for Loss of Control:

❑ fear of toilet/bathroom ❑ sudden urgency ❑ preoccupied so not responsive to signal ❑ unaware of urine loss ❑ other

Associated Symptoms:

❑ constipation ❑ abdominal discomfort

Toileting Posture:

Describe position sitting on/standing at the toilet: (foot, knee, hip, and back positions)

_____

_____

Underwear/Protection Used: _____

Impact of Bladder Problem on Daily Life: (circle one)

0 1 2 3 4 5 6 7 8 9 10

none moderate significant

What activities have changed:_____

_____

Medical History:

❑ UTIs ___# in past year

❑ Serious Illness List: _____

❑ Surgery List:_____

❑ Developmental Delays List: _____

❑ Medications List: _____

❑ Family History: Mother_____ Father_____ Siblings_____

❑ Toilet Trained: Bladder at ___ yrs/old Bowel at __ yrs/old

Medical Tests

Bladder

Post-Void Residual(PVR) - Analysis of the amount of fluid remaining in the bladder immediately following urination. Measurement of PVR volume is through pelvic ultrasound or catheterization.

Urinalysis - Analysis of urine to locate blood, glucose(sugar), calcium, protein, or bacteria.

Ultrasound Bladder Scan - Renal and pelvic ultrasound to screen the kidney, ureters and bladder for possible upper or lower urinary tract abnormalities. It also pictures the PVR, the amount of urine remaining in the bladder.

Voiding Cystourethrogram(VCUG) or Cystometrogram(CMG) - A CMG measures bladder pressure as it is filled with fluid using a catheter, A VCUG studies the bladder and urethra, bladder pressure, any ureter reflux, urine flow, contraction of bladder neck with voiding, or PVR.

Urodynamic Testing - Urodynamic testing measures bladder pressure with filling, urine flow rate, PVR, sphincter activity during filling and emptying, and inter-abdominal pressure. It is effective in identifying neurogenic causes of dysfunction and risk of kidney involvement.

Uroflow tests the ability of urine to flow down the urethra, the amount, force and length of flow.

Bowel

X-Ray, Flat Plate - Analysis of fecal material in colon and rectum. It provides evidence of constipation, impaction and any vertebral anomalies.

Anorectal Manometry - Analysis of anal and rectal function including anal resting pressure, anal squeeze pressure, rectal sensation and response of pelvic muscles during straining.

Pudendal Nerve Motor Latency - Analysis of pudendal nerve conduction speed as it innervates the pelvic muscles including the external anal sphincter. It is used in identifying the extent of dysfunction in Hirschrung's syndrome and anal atresia or anal sphincter defect.

Medications

Bladder

Commonly used medications for bladder dysfunction include Ditropan (oxybutin chloride), Levsin (hyoscyamine sulfate), Tofranil (imipramine hydrochloride), and DDAVP (analogue vasopressin).

Ditropan is an anti-cholinergic medication that affects the ability of the bladder to contract and is used to help the bladder relax.

Levsin is an anti-cholinergic medication that is mildly anesthetic and a bladder relaxant.

Tofranil is a tricyclic antidepressant that decreases the bladder muscle's ability to contract and increases closure of the bladder outlet.

DDAVP is a nasal spray that stimulates the anti-diuretic hormone which promotes water reabsorption and decreases urine output. It is used for primary nighttime bedwetting.

Bowel

Commonly used medications used to empty out the lower bowel when significant constipation or impaction occurs include mineral oil, magnesium citrate, Miralax, Lactulose, Senocot tablets and enemas.

Mineral oil is a lubricating agent that coats the stool preserving water in the stool as it descends throughout the colon.

Magnesium Citrate is a saline agent that draws water into the intestine and stimulates stool movement through the colon.

Lactulose is an osmotic agent which acts with bacteria to increase osmotic pressure which increases its water content and softens the stool.

Miralax is an osmotic agent that softens, lubricates and increases bulk of the stool.

Senocot is a stimulant agent that increases peristaltic movement in the intestine and can stimulate water secretion from the intestine with increased dosages.

Phosphate and saline/tap water enemas can be helpful after an unsuccessful medication trial in children 5 years of age or older.

Once the bowel is cleaned out bulk forming agents can help maintain normal bowel function. These include Metamucil wafers, Citrucil, Fibercon, Kashi cereal, or other high bran cereals. It is important that an 8 ounce glass of fluid is consumed with each serving of fiber.

Chapter 7

Anatomy and Function of the Bladder, Bowel, and Pelvic Muscles

Anatomy and Function of the Bladder, Bowel, and Pelvic Muscle Systems

The four main systems that help process waste material (urine and bowel movements) are the urinary system, the bowel (gastrointestinal) system, the pelvic muscle system, and the nervous system. These systems must work together to achieve optimal bladder and bowel health in children. That is why the Roll for Control Program incorporates exercise, Physiological Quieting, and lifestyle change to optimize bladder and bowel function. Coordination of the four systems is an essential component to bladder and bowel health and control. The first step in implementing the program is to understand how these systems work and how they interrelate.

First let's talk about how your bladder functions. Your bladder is like a balloon that holds your urine until it is time to go to the toilet. (Fig. 1) The bladder contains muscles that tighten/contract to push urine out and relax to hold urine in until it is time to toilet. Most of the day and night the bladder must be relaxed to receive and hold waste material. It is only during a few minutes of the day that it tightens/contracts to eliminate the urine from the body.

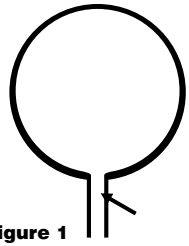


figure 1
The bladder and bladder outlet

Now let's talk about how your bowel functions. Your bowel is like a tube within a tube that holds your bowel movement until it is time to go to the toilet. The bowel tubes contain muscles that tighten/contract to push the bowel movement out and relax to hold the bowel movement in until it is time to toilet. Most of the day and night the lower bowel remains relatively relaxed to receive and hold the waste material. It is during several minutes of the day that it tightens/contracts to eliminate the waste material from the body.

Now let's talk about how your pelvic muscle system functions. (Fig. 2) The pelvic muscle system includes a muscular bowl located in your pelvis between your hip bones. It contains muscle slings with openings in the bottom of the bowl. One opening is to let urine escape and another is to eliminate bowel movements.

The bowl of muscles is attached within your pelvis to other muscles that then attach to your leg bones at your hips. This group of muscles we call the Pelvic Muscle Force Field. The Pelvic Muscle Force Field is a series of muscles that work together to hold the bladder and bowel in a stable position in the pelvis and maintain the bladder and bowel outlets closed until it is time to toilet. (Fig. 3) When it is time to toilet, the Pelvic Muscle Force Field releases to let the urine or bowel movement empty. (Fig. 4) Twenty-three and a

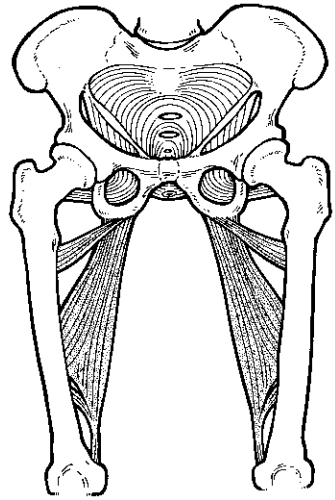


figure 2
Pelvic Muscle Force Field

half hours of the day your bladder and bowel remain relatively quiet to hold in the urine and bowel movements. They are expanding to allow urine and bowel movements to accumulate in the bladder and bowel. At the same time the Pelvic Muscle Force Field holds the bladder and bowel outlets closed so nothing leaks out.

When it is time to toilet, your bladder and bowel contract for a few minutes at a time to push urine and bowel movements out. At the same time the Pelvic Muscle Force Field releases to open the outlets so urine and bowel movements can exit.

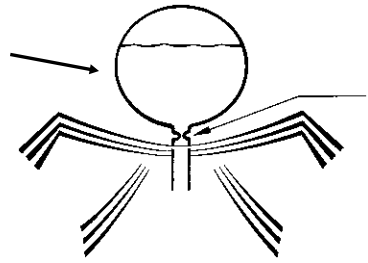


figure 3
Bladder outlet closure through muscle action

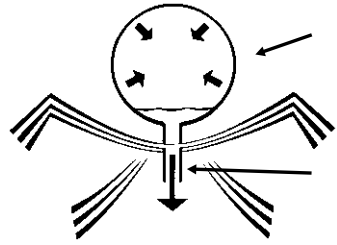


figure 4
Bladder outlet opening through muscle relaxation

Chapter 8

Roll for Control Exercises

How the Roll for Control Exercises Improve Bladder and Bowel Control

The Pelvic Muscle Force Field has three parts: (Fig. 5)

1.) Central core we will call the pelvic bowl
2.) Outer portion we will call the outrigger pulleys, and
3.) Inner portion we will call the electrical fireworks.

The central core of the force field is the bowl of muscle attached to the pelvis with openings at the bottom for emptying. One of the primary functions of the pelvic bowl of muscle is to maintain a stable position of the bladder and bowel in the pelvis 24 hours a day. The outer and inner portions of the Pelvic Muscle Force Field enable the pelvic bowl to work and rest while still maintaining the best position and function of the bladder and bowel.

The Outrigger Pulleys

The outer portion of the Pelvic Muscle Force Field is like your grandmother's clothesline. (Fig. 6)

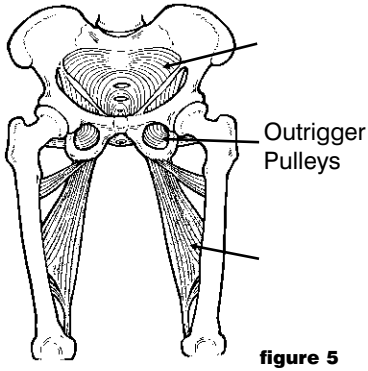


figure 5
Pelvic Muscle Force Field

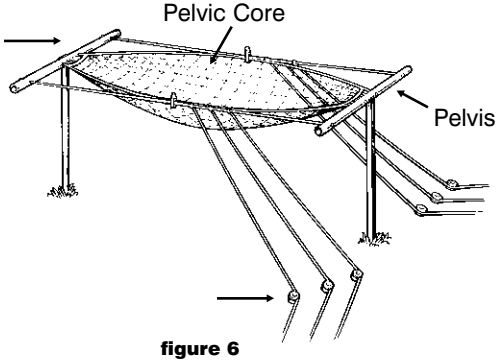


figure 6
The Clothesline

The pelvic bowl or core, your grandmother's sheet, is attached to the two clotheslines. The clotheslines are also attached to outrigger pulley lines that go through pulleys that are attached to the ground. These outrigger pulley lines are muscles attached to your legs close to your hips. When your hips roll out the outrigger pulley lines are shortened and the clotheslines pull apart. As a result, the sheet/pelvic bowl is passively lifted up and the outlets are closed.

The outrigger pulley exercises are designed to strengthen the Pelvic Muscle Force Field by using the outer muscles. To lift your pelvic bowl up and keep the bladder and bowel outlets closed you roll your knees apart. When your hips roll out the outrigger pulley lines pull the clotheslines apart and lift the bowl up. This closes the openings in the bowl and keeps the urine in the bladder and the feces in the anus and rectum. So to effectively lift the pelvic muscles using the outrigger pulley lines do the exercise called Outrigger Pulls.

Outrigger Pulls Exercise (Fig 7)

1. Secure the elastic band around your legs just above the knees. Your legs should be touching each other and the band should be tied firmly and securely.
2. Focus on your slow low breathing and maintain that breathing throughout the exercise.
3. Separate your knees 2"-3", rolling them out against the band and rotate your heels together.
4. Hold your knees and heels in this position, pushing against the band for a slow count of 10.
5. Return to the knees together position and rest for a slow count of 10.
6. Repeat this exercise 10 repetitions morning and night.

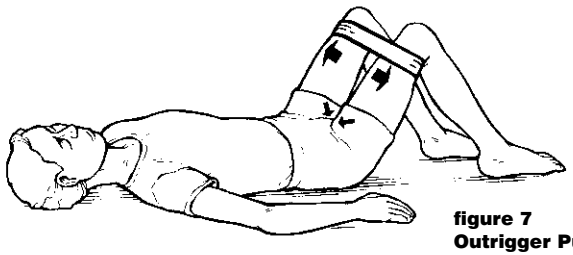


figure 7
Outrigger Pulls Exercise

The Electrical Fireworks

The inner portion of the Pelvic Muscle Force Field is like fireworks.(Fig. 8) When the muscles of your inner thighs tighten/contract to bring your legs together electrical fireworks occur through the inner thigh muscles and travel to any other muscles that are close to them. The pelvic bowl attachments are very close to the fireworks muscles so the fireworks' electricity travels to the pelvic bowl. When your hips roll in the electric fireworks of the inner thigh muscles flow into the pelvic bowl increasing its activity. This stimulates the pelvic bowl to lift and the outlets to close. The following exercise is designed to strengthen the Pelvic Muscle Force Field by using the inner thigh muscles fireworks' electricity. To effectively lift the bladder and close the outlet using the fireworks muscles do the exercise called Electric Fireworks.

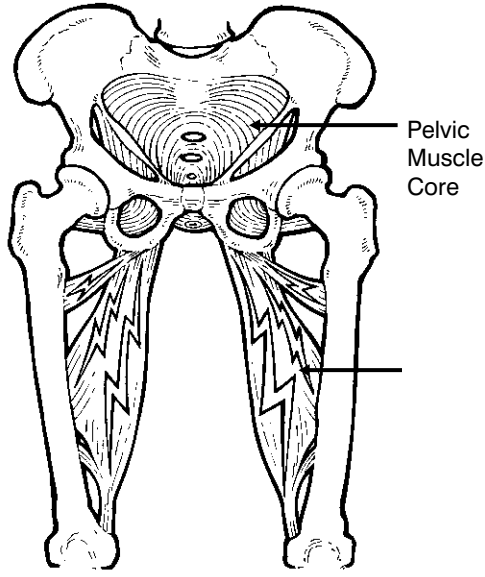


figure 8
Electrical Fireworks Muscles

Electrical Fireworks Exercise (Fig. 9)

1. Place the soft ball between your legs just above the knees.
2. Focus on your slow low breathing and maintain that breathing throughout the exercise.
3. Bring your knees together, rolling them in against the ball as you rotate your heels apart.
4. Hold your knees and heels in this position, pushing against the ball for a slow count of 10.
5. Return to the knees apart position and rest for a slow count of 10.
6. Repeat this exercise 10 repetitions morning and night.

Special Considerations during Exercises

Youngsters with spina bifida may have shallow hip joints with a tendency for hip dislocation. If hip subluxation or dislocation is a risk the exercises are carried out using a wedge between the legs so the legs remain in abduction which stabilizes the hip joint. (Fig. 10)

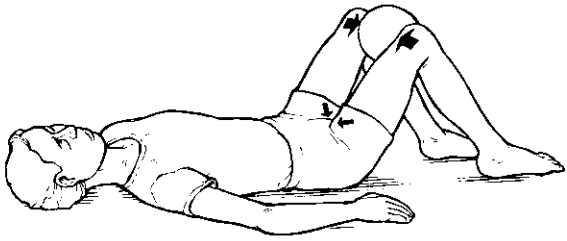


figure 9
Electrical Fireworks exercise

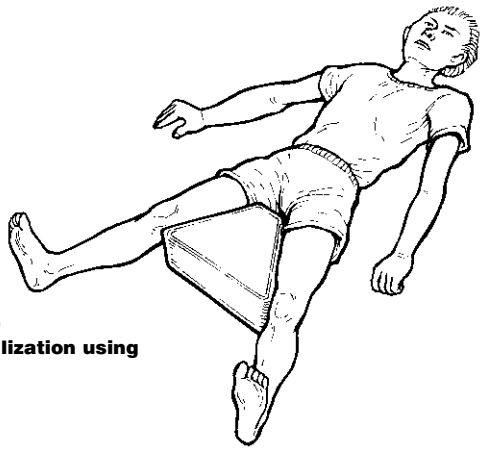


figure 10
Hip stabilization using wedge

How the nervous system affects bladder and bowel muscles

The bladder and bowel muscles relax to fill with urine or stool and contract to empty urine and stool when the brain perceives fullness. The autonomic nervous system is the telephone system that sends messages between the brain and the bladder or bowel telling them to contract or relax. If the telephone system that operates the bladder or bowel thinks the bladder or bowel is full, the message system tells the organ to contract. That message should be heard every 2-4 hours for the bladder and once every day or two for the bowel to prompt you to go to the toilet. Sometimes the message system gets confused as to how much urine is really in the bladder or how much stool is in the bowel. There may be very little urine in the bladder yet the message system tells the bladder to contract and you feel the need to go to the toilet. There may be a large amount of stool in the bowel yet the message system tells the bowel to relax instead of contract. Frequent toileting or infrequent bowel movements can disrupt your life and cause you to be afraid to go places and plan activities. You can help stop the abnormal signals by using Physiological Quieting techniques that train the bladder and bowel muscles to contract at appropriate times.

How Physiological Quieting improves bladder and bowel control

Physiological Quieting is often overlooked or ignored while you do the exercises to improve the Pelvic Muscle Force Field. In fact, Physiological Quieting trains the bladder and bowel by normalizing the autonomic nervous system that controls the bladder and bowel. It is possible to train the autonomic nervous system and the bowel and bladder to have more normal bladder and bowel function. Physiological Quieting also normalizes the pelvic muscle resting tone to make it easier to toilet, emptying easily and completely as well as holding when it is appropriate.

To effectively normalize bladder and bowel function, use the Physiological Quieting techniques of diaphragmatic breathing and handwarming.

Diaphragmatic Breathing

1. Inhale slowly, let your bellybutton rise.
2. Exhale slowly, let your bellybutton fall.
3. Think "Quiet shoulders, quiet chest, jaw released, tongue relaxed".
4. Inhale through the nose, exhale through the lips if possible.

Handwarming

1. Focus your attention on the warmth or coolness in your hands.
2. Think "My hands are warmer and warmer. Warmth is flowing into my hands warmer and warmer."
3. Imagine the warmest color surrounding your hands and flowing into your hands.
4. Imagine and visualize your hands in the warmest, safest place.
5. Feel your hands absorbing the warmth from the warmest color and the warm, safe place.

Physiological Quieting techniques can erase confusion in the message system and allow the bladder to relax while it fills with fluid or the bowel to act when it needs to eliminate feces. Here is how it works. The telephone system that communicates with your bladder and bowel also communicates with all the other muscles of the body. Practicing Physiological Quieting tells the bladder and bowel muscles to function normally instead of acting too much or too little because the telephone messages are more accurate for your specific needs. Diaphragmatic breathing and handwarming train the autonomic nervous system to send messages to the bladder and bowel that result in normal urination and bowel movements. All parts of your body are connected to all other parts. Remember the song "the leg bone is connected to the ankle bone, the ankle bone is connected to the foot bone". Even muscles you are not aware of being able to control, like the bladder or bowel, are affected when you change other parts of your body, like the temperature in your hands or the rate and smoothness of your breathing.

Chapter 9

Behavioral Intervention Strategies

Behavioral Intervention for Independent Toileting

Note: Steps 1-3 are maintained throughout the progression through Step 6.

STEPS:

1. Timed Voiding/Scheduled Voiding
2. Wet Pants Changing
3. Roll for Control Exercises
4. Modeling Desired Voiding Behavior
5. Prompted Voiding Behavior
6. Independent Scheduled Voiding
7. Independent Inner Message Voiding

Step 1: Timed Voiding /Scheduled Voiding

a. Every 2-3 hours or assess the length between wetting episodes and time toileting to just precede the wetting length.
   Note: if incomplete voiding- double void
b. Adequate fluid, non-caffeinated, 1 glass/meal, 1 glass between each meal.
c. Verbal /sign prompt when time to toilet. "Time to go to toilet."

Step 2: Wet Pants Changing

a. Change in quiet, private area with no radio, tv, friends for stimulation.
b. Change wet for dry pants without verbiage, eye contact, or emotion.
c. Return to pleasant daily activities.

Step 3: Roll for Control Exercises

a. Resisted hip roll in and out (chapter 8).
b. Diaphragmatic breathing.
c. 10 repetitions morning and night.

Step 4A: Modeling Desired Voiding Behavior

a. Using Step 1 a same sex adult or child goes with the child and urinates in the toilet every 2 hours while the child watches. The child observes correct behavior for undressing, positioning at the toilet, wiping, redressing, and washing.
b. Positive verbal/sign and concrete reinforcement with each trial.

Step 4B: Modeling Desired Voiding Behavior

a. Using Step 4A with addition that child models back behavior using a doll.
b. Position doll on/at toilet, squeeze doll so water flows out, wipe, and dress.
c. Positive verbal/sign to doll and child.

Step 4C: Modeling Desired Voiding Behavior

a. Using Step 4A with addition that the individual models back behavior observed.
b. Clothing removed, positioning at/on toilet, urinate if possible (in slow count of 10), redressing, washing.(void in tub of warm water if needed)
c. Positive verbal/sign and concrete reinforcement with each trial.

Step 4D: Modeling Desired Voiding Behavior

a. Using Step 4A with addition of stimulus for urination if needed.
b. Run water in washbowl, step in tub of warm water before standing at toilet, stand at toilet on a towel and pour warm water on lower legs.
c. Positive verbal/sign and concrete reinforcement with each urination.

Step 5: Prompted Voiding Behavior

a. Stand at bathroom door and cue with verbal/sign to toilet/urinate.
b. Positive verbal/sign and concrete reinforcement with each trip to toilet.

Step 6: Independent Scheduled Voiding

a. Individual toilets self-initiated every 2-3 hours.
b. Use a watch that vibrates or timer that buzzes.
c. Positive verbal/sign and concrete reinforcement with each trip to toilet.

Step 7: Independent "Inner Message" Voiding

a. Individual toilets when inner message says "toilet".
b. Individual marks chart with self reinforcement stars and shows it to parent.

Behavioral Intervention for Nighttime Bedwetting-Primary Type

Note: toileting frequency daytime every 3-4 hours
STEPS:
1. Adequate Timed Fluid Intake
2. Roll for Control Exercises
3. Positive Self Statements
4. Nighttime Alarm

Note: Steps 1-4 are carried out simultaneously.

Step 1: Adequate Timed Fluid Intake
- a. Eight ounce glass of fluid at each meal.
- b. Eight ounce glass of fluid between each meal.
- c. No drinking 3-4 hours before bedtime.
- d. Eliminate caffeine and soda drinks, bladder irritants.

Step 2: Roll for Control Exercises (chapter 7)
- a. Resisted hip roll in and out (see diagrams).
- b. Diaphragmatic breathing.
- c. 10 repetitions morning and night.

Step 3: Positive Self Statements
- a. Before bedtime repeat 5-6 times.
- b. "I deserve to sleep through the night and be dry." "I sleep through the night and am dry."

Step 4: Nighttime Alarm
- a. Use a night alarm with electrode in underwear.
- b. Star chart records nighttime toileting or sleeping through the night with stars and small or large leaking episodes with stars.
- c. Child wakes to the alarm when there is leaking, goes to the toilet and changes underwear and sheets if needed. Parent may need to wake child for 1-2 weeks if child sleeps through the alarm.
- d. Parent positively reinforces child for carrying out the program each morning.

e. Discontinue alarm after one month being dry.

Behavioral Intervention - The Nighttime Alarm

The nighttime alarm is designed to alert the individual to a full bladder during sleep. The alarm sounds when a small amount of urine leaks onto the detector plate in the underwear. The youngster awakens to the buzzing sound or to the vibration of the alarm. Gradually the youngster begins to awaken to the sensation of a full bladder before there is any leaking.

The alarm includes the noise or vibration box that attaches to the nightshirt. An electrode or detector plate slips into a pocket sewn in the underwear. A wire connects the detector with the noise/vibration box.

Success rates vary from 60%-80% (Forsythe and Butler 1989) when the program is completed. There can be as much as a 40% drop out rate.

The nighttime alarm is appropriate if:

-the young person is requesting help with the nighttime wetting problem.
-the young person is at an appropriate age to be able to go to the toilet alone, change underwear and pajamas, and return to bed.
-the young person is comfortable using the alarm.

The nighttime alarm is not appropriate if:

-the young person is resisting or uninterested.
-the young person is afraid of the alarm.
-the young person experiences transient wetting.
-the young person is an extremely heavy sleeper.

Nighttime Routine

It is important that the young person has a practice run using the alarm and nighttime routine. During this practice run he/she learns how to set up the alarm system, hears what it sounds like when it goes off, and practices the routine to do when the alarm goes off in the night.

Bedtime Routine

1. Go to the toilet and empty bladder.
2. Attach the alarm to the pajamas.
3. Repeat positive self statements 5-6 times. "I deserve to sleep through the night and wake up dry. "I sleep through the night and wake up dry."
4. Go to bed.

Alarm Routine

When the alarm goes off the young person:

1. Turns off the alarm and disconnects it.
2. Goes to the toilet and empties bladder.
3. Replaces underwear and pajamas if wet.
4. Remakes bed if sheets are wet.
5. Replaces electrode in underwear and turns on alarm.
6. Returns to bed and sleeps.
7. Records on the program chart in the morning.

Parent Routine

1. Place spare clean sheets in the bedroom.
2. Place spare clean underwear in the bathroom.
3. Provide a covered container to place soiled clothing.
4. Do not take the young person to the toilet.

Success Criteria

It is not uncommon that progress has ups and downs. Progress is initially carrying through with the program successfully. For instance, in the first few days success may be placing the alarm correctly and remembering the positive self statements. The next level of success is waking to the alarm and going to the toilet. The third level of success is having smaller wet spots when the alarm sounds. The fourth level of success is waking without alarm and going to the toilet and/or sleeping through the night. In summary, first the young person needs to feel he/she has done the work necessary to be dry. Next the young person feels in control. Finally the young person experiences success.

Behavioral Intervention for Effective Bladder Emptying

Effective bladder emptying factors include postural alignment on the toilet, pelvic muscle relaxation, and bladder contraction effectiveness.

Postural Alignment on the Toilet

When sitting on the toilet feet are supported so hips are bent to 90 degrees. Use a foot stool if needed to correctly position the hips with feet resting flat on a surface. Remove pants and underwear down to the ankles, relax legs apart, and lean slightly forward with wrists and hands resting on knees. If that does not solve the problem the young girl can sit backwards on the toilet, facing the toilet tank, legs straddling the toilet bowl and resting arms on the tank.

Pelvic Muscle Relaxation

When comfortably sitting on the toilet, roll knees in and out 4-5 times slowly. Inhale as the knees are rolled out, exhale as the knees are rolled in. This is an active, relaxing activity not a resistive exercise.

Effective Bladder Contractions

With hands and wrists resting on knees, let the stomach muscles be soft and relaxed. Inhale and straighten the back, exhale relax the back 3-4 times. Then think to yourself 4-5 times, "My hands are warmer and warmer. The warmest color is flowing into my hands warmer and warmer (name the color)."

Effective Urine Flow

As urine begins to flow continue to breathe in and out, count slowly to 10 and imagine a continuous flow of urine.

Double Voiding

When bladder emptying is incomplete:

1. Sit comfortably on the toilet.
2. Relax legs, feet flat on support.
3. Knees positioned slightly higher than hips.
4. Empty bladder.
5. Roll knees in and out 3-4 times.
6. Slow low breathe for 30-90 seconds.
7. Empty bladder again.

Behavioral Intervention for Effective Bowel Emptying

Effective bowel emptying is designed to recondition bowel habits by stimulating the gastrocolic reflex, improving toileting posture, and normalizing bowel and pelvic muscle activity.

On awakening

1. Roll knees in and out slowly 4-5 times. Inhale roll knees out, exhale roll knees in 4-5 times.
2. Gently massage lower abdomen: Begin on the lower right side. Making clockwise circular motions proceed up to the umbilicus level then across to the left side. Continue the gentle massage down the left side of the lower abdomen. Repeat 2-3 times.
3. Drink a glass of warm non-caffeinated fluid.
4. Try to toilet, sitting comfortably on the toilet for a maximum of 5-10 minutes.
5. Try to toilet a maximum of 2-3 time per day. For example when there is an urge, when there is usually fecal soiling, after each meal, after school or at bedtime.

When on the toilet

1. Position feet flat on a surface so knees are slightly higher than hips.
2. Rest hands and wrists on the knees.
3. Roll knees in and out 3-4 times. Inhale roll knees out, exhale roll knees in.
4. Do not strain or breath-hold to push.
5. Blow out gently like blowing bubbles or pin wheel to push.

After a bowel movement

1. Roll knees in and out 4-5 times to close anal sphincter and "clean cut" the stool.

Exercise each day

Exercise 20-30 minutes each day. The exercise should be mild to moderately aerobic such as walking, biking,or swimming.

Wipe, Woosh (flush), and Wash Protocol

1. Wipe your bottom after toileting.
2. Flush the toilet.
3. Wash your hands and dry them.

For each skill of Wipe, Woosh (Flush), and Wash follow the sequential protocol:

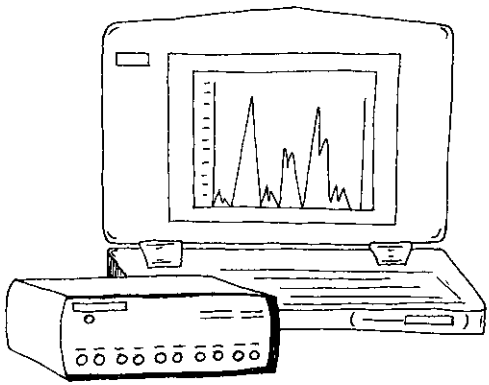
1. Observe an adult or other child during this behavior.
2. Practice on a doll.
3. Perform with assistance.
4. Perform independently.

Biofeedback

Biofeedback training with audio and visual feedback of pelvic muscle activity can be beneficial with recurrent urinary tract infection, dysfunctional voiding patterns, bladder reflux syndrome, and constipation. Young people with spina bifida, anal atresia, or Hirschprung's syndrome can benefit from biofeedback if there is some innervation to muscle structures and the individual is motivated to use the biofeedback in an exercise program. Biofeedback can be used alone or in conjunction with other behavioral programs and medications.

When using biofeedback for muscle retraining, surface sensors are placed in the pelvic muscle area and over the abdominal muscles. The young person practices pelvic muscle tightening and releasing using the audio or visual feedback to determine if the muscle action is done correctly.

When using biofeedback for autonomic nervous system training thermal sensors and a breathing belt can be used to feedback body temperature and breathing pattern changes. These changes are observed during Physiological Quieting practice and indicate changes in the autonomic nervous system control of the bladder and bowel .



Behavioral Intervention - Dietary Changes for Urgency and Frequency of Urination

When urgency and frequency are components of dysfunctional voiding food and drink that irritate the bladder can be part of the cause. Removal of these products may improve symptoms within a few days.

Bladder Irritants

Carbonation (soda)
Citrus (fruit or juice of oranges, lemons, grapefruit)
Acidic (cranberries, pineapple, tomatoes, vinegar)
Caffeine (coffee, tea, soda)
Chocolate
Spicy Food/Chilis
Artificial Sweeteners

Adequate water intake is important for normal bowel and bladder function. An 8-ounce glass of water at each meal and one between each meal provides the average young person adequate fluid for the day. Fluid is also consumed in foods like soups, gravies, and fruits. Milk and apricot juice are non-acidic non-irritating drinks. Water can be sweetened with a small amount of vanilla, mint, or Jello.

Behavioral Intervention - Dietary changes for the Bowel

When constipation is a component of dysfunctional voiding foods can be a contributing factor. Decreasing the quantity of these products can improve symptoms in a few days to a week. These foods include cheese, chocolate, pasta, and rice.

In constipation adequate dietary fiber is important to improve stool consistency and frequency. Fresh or lightly cooked fruits and vegetables provide additional fiber. Unprocessed bran can be sprinkled on foods the young person likes to eat. Kashi cereal, bran cookies, or Metamucil wafers provide additional fiber in the diet.

When dietary fiber is not sufficient to normalize bowel function the bowel can be "cleaned out" using magnesium citrate, mineral oil, Senocot liquid or tablets, miralax or lactulose by mouth or using an enema. This intervention may be continued for 1-3 months while bowel function normalizes- soft, normal size stool at regular intervals without straining. A physician or related medical professional supervises this process.

When irritable bowel syndrome, diarrhea, or intestinal pain are symptoms foods that can be contributing factors include:

Spicy foods/chilis,
Citrus fruit or juice (oranges, lemons, grapefruit)
Acidic fruits and vegetables (cranberries, pineapple, tomatoes, vinegar)

Sensitivity to milk products or wheat products can cause irritation to the bowel. Elimination of these products for 7-10 days should significantly improve symptoms if the sensitivity is a factor in the bowel irritation.

Adequate water intake is important for normal bowel function. An 8 ounce glass of water at each meal and one between each meal provides the average young person adequate fluid for the day. Fluid is also consumed in foods like soups, gravies, and fruit.

Behavioral Interventions - Neurogenic Bowel

Neurogenic bowel occurs with interruption of nerve transmission to the lower intestine and pelvic muscles in diagnoses like spina bifida and spinal cord injury. The two types of neurogenic bowel are reflexive and areflexive.

Lesions above T12-L1 lead to a reflexive bowel. Reflex arcs below the lesion remain intact so the young person exhibits an anal wink and reflex emptying of the bowel. Messages from the brain are absent. The gastrocolic reflex to stimulate colon activity with eating is absent. Reflex elimination can be stimulated with rectal stimulation, stretching, suppositories or warm fluid.

Lesions at or below T12-L1 lead to an areflexive bowel. The reflex arcs are significantly impaired and the external anal sphincter is flaccid. Transit times through the colon can be longer with greater absorption of water and resulting constipation and enlarged rectum. Rectal stimulation does not produce elimination of stool. Stool softeners and bulking agents are essential. Toileting position is optimal when sitting with knees higher than hips which helps with gravity evacuation. Bearing down or Valsalva maneuver increases intra-abdominal pressure to eliminate stool. Stool remaining in the rectum may need to be manually removed.

Chapter 10

MONITORING CHARTS

Daytime Data Chart

Nighttime Data Chart

Reward Chart

Daytime Data Chart

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
breakfast							
school							
break							
lunch							
break							
hometime							
supper							
evening							
bedtime							

Check and record at the above times using the following:

Urine:
* = dry D = damp V= visible on clothing P = puddle T = toilet U = urgency

Bowel:
B = bowel movement S = underwear stains A = accident in underwear

Fluid: F = 8 oz. fluid

Nighttime Data Chart

Record each morning:

T = Toilet

D = Dry

S = Slightly Wet

W = Big Accident

Week _______

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Week _______

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Week _______

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Week _______

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Week _______

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Week _______

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Week _______

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Week _______

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Week _______

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Journey to the Mountain Top

(Reward Chart)

Each Day:

Nighttime Bladder

Color one square if your bed is slightly wet.
Color two squares if your bed is dry.

Daytime Bladder

Color one square if you toilet every _____ hours.
Color two squares if your underwear is dry.

Bowel:

Color one square if you have a soft bowel movement.
Color two squares if you have clean underwear and a soft bowel movement.

Each time you go over the bridge you will get _____.

When you reach the mountain top you will get_____.

You will share your successes with _____ who will celebrate with you.

References

Agnarsson U, Warde C, et al. Anorectal function of children with neurological problems. I: spina bifida. Developmental Medicine & Child Neurology. 35: 893-902, 1993.

Benninga M, et al. Biofeedback training in chronic constipation. Archives of Disabled Children. 68:126-139, 1993.

Blackwell C. A Guide to Enuresis: A Guide to the Treatment of Enuresis for Professionals.2nd ed Northumberland Clinical Psychology Service, Bristol, England, 1995.

Chaney C. A collaborative protocol for encopresis management in school-aged children. Journal of School Health. 65(9): 360-364, 1995.

Edwards-Beckett J, King H. The impact of spinal pathology on bowel control in children. Rehabilitation Nursing 21(6): 292-297, 1996.

Forsythe W, Butler R. Fifty years of enuretic alarms: a review of the literature. Archives of Disease in Childhood. 64:879-885, 1989.

Hanson E, Hellstrom A, Jodal U. Rehabilitation of the dysfunctional bladder in children: method and 3-year follow-up. The Journal of Urology, 138: 847-849, 1987.

Hinman, F. Non-neurogenic neurogenic bladder (the Hinman Syndrome)-15 years later. The Journal of Urology 136: 769-777. 1986.

Hoebeke P, Walle J, et al. Outpatient pelvic-floor therapy in girls with daytime incontinence and dysfunctional voiding. Urology 48: 923-927, 1996.

Hulme J. Beyond Kegels: Fabulous Four Exercises and More To Prevent and Treat Incontinence. 2nd ed. Phoenix Publishing, Missoula, Mt, 2002.

Hulme J. Beyond Kegels: Book II Clinicians Guide to Treatment Algorithms and Special Populations. 2nd ed. Phoenix Publishing, Missoula, MT. 2002.

Hyman P. ed. Pediatric Functional Gastrointestinal Disorders. Academy Professional Information Services, Inc. NY, NY, 1999.

King J, Currie D, Wright E. Bowel training in spina bifida: importance of education, patient compliance, age and anal reflexes. Archives of Physical Medicine and Rehabilitation. 75(3): 243-247, 1994.

Kirsch S, et al. Continence following electrical stimulation and EMG bio-

feedback in a teenager with imperforate anus. Journal of Pediatric Surgery. 28:1408-1410, 1993.

Loening-Baucke V. Assessment, diagnosis and treatment of constipation in childhood. Journal of Wound Ostomy and Continence Nurses 21(2): 49-58, 1994.

Loenig-Baucke V. Encopresis and soiling. Pediatric Clinics of North America 43:279-298, 1996.

Loening-Baucke V. Urinary incontinence and urinary tract infection and their resolution with treatment of chronic constipation of childhood. Pediatrics 100(2): 228-232, 1997.

Poenaru D et al. The pediatric bowel management clinic: initial results of a multi-disciplinary approach to functional constipation in children. Journal of Pediatric Surgery 32(6): 843-848, 1997.

Rosenberg A. Constipation and Encopresis in Pediatric Gastro-Intestinal Disease, Pathophysiology, Diagnosis, Management. Wyllie, R. and Hyams J ed. W.B. Saunders, 1993.

Rushton H. Wetting and functional voiding disorders. Urologic Clinics of North America 22(1): 75-93, 1995.

Seth R et al. Management of constipation and encopresis in infants and children. Gastrointestinal Clinics of North America. 23: 621-636, 1994.

Stockbrugger R., Pace F ed. The Irritable Bowel Syndrome Manual. Mosby-Wolfe Medical Communications. Philadelphia, Pa 1999.

Wennergren H, Oberg E. Pelvic floor exercises for children: a method of treating dysfunctional voiding. British Journal of Urology. 76: 9-15, 1995.

White M. Teaching continence to children with disabilities. Professional Care of Mother and Child. 3(5): 139-142, 1993.

Whitehead W, Parker L et al. Treatment of fecal incontinence in children with spina bifida: comparison of biofeedback and behavior modification. Archive of Physical and Medical Rehabilitation 67: 218-224, 1986.

Yokoyama J et al. Constipation and Fecal Incontinence and Motility Disturbances of the Gut. Springer0Verlag. 1989

Children's Books

Gome T. Everybody Poops. Kane/Miller Book Pub, Brooklyn NY, 1993.

Cho S. Once Upon a Potty. Kane/Miller Book Pub. Brooklyn NY, 1994.

Products

Bedwetting Alarms

SleepDry 1 800 346-7283
WetStop 1 800 549-8371

Timed Voiding Watches

VebraLITE Vibrating Watch
Demose Six Alarm Vibrating Watch
Timex Ironman Triathalon and Expedition Watch (available at sporting goods stores)

Toileting Doll (available at toy stores)

Order Form

Bladder and Bowel issues for Kids	____@$14.95 = $_____
A Day in the Life of Bobbie Bladder and Carrie Colon	_____@$5.95 = $_____
(10 or more)	_____@$4.95 = $_____
Geriatric Incontinence: A Behavioral & Exercise Approach to Treatment	____@$29.95 = $_____
Roll for Control Video	____@$19.95 = $_____
Ball and Band set	____@$8.00 = $_____
Physiological Quieting audiotape	____@$10.00 = $_____
Physiological Quieting CD	____@$15.00 = $_____
Wet-Stop night alarm	____@$65.00 = $_____

POSTAGE & HANDLING

If your order is:

up to $18.00	Add $ 3.50
$ 18.01 - $ 35.00	Add $ 5.00
$ 35.01 - $ 50.00	Add $ 6.00
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