



A GUIDE TO TREATING YOUR CHILD'S
**Daytime or Nighttime Accidents,
Urinary Tract Infections and Constipation**

UCSF BENIOFF CHILDREN'S HOSPITALS UROLOGY DEPARTMENT

This booklet contains information that will help you understand more about your child's bladder problem(s) and provides tips you can use at home before your first visit to the urology clinic.

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Dear Parent(s),

Your child has been referred to the Pediatric Urology Parent Program at UCSF Benioff Children's Hospitals. We specialize in the treatment of children with bladder and bowel dysfunction. This booklet contains information that will help you understand more about your child's problem(s) and tips you can use at home before your first visit to the urology clinic. Please review the sections below that match your child's symptoms.

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(Bowel Dysfunction)

2. Bladder Dysfunction (p. 7)

Includes daytime incontinence (wetting), urinary frequency and infrequency, dysuria (painful urination) and overactive bladder

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A Quick Note: Telemedicine

The Urology Department has discovered that videoconferencing is a great asset. It allows patients to talk through their concerns without the burden of traffic, parking fees or long vigils in the waiting room. We now see all our patients via telemedicine, though occasionally an in-person evaluation is required. That's determined on a case-by-case basis and can be discussed with your provider.



Introduction

It's distressing to see your child continually having accidents. The good news is that the problem is very common – even if it doesn't feel that way – and that children generally outgrow it. However, the various interventions we offer can help resolve the issue sooner rather than later.

Childhood bladder and bowel dysfunction takes several forms. It consists of any of the following: wetting during the day, urinary frequency/urgency, wetting during sleep (nocturnal enuresis), pain with peeing, constipation, encopresis (stool incontinence) and recurrent urinary tract infections. All of these conditions have different patterns and causes, and they may require different treatment plans.

What you might not know is that most urinary ailments involve a problem with bowel function – specifically, constipation. Almost all kids with bladder problems will benefit from treatment of stool retention, even if they're having daily bowel movements.

The purpose of this booklet is to give you a better understanding of both abnormal *and* normal urination, to help determine the cause of abnormal urination and to show how normal urination can be resumed. We're going to start at the beginning: stool retention.

1. Stool Retention and Urologic Problems (Bowel Dysfunction)

Normal Bowel Function

The digestive process begins as soon as food is taken into the mouth. Saliva starts to break the food down, and the process continues as the food passes through the esophagus and into the stomach. It then moves into the small intestine in semiliquid form. The body begins to absorb nutrients from this substance through the small intestine wall, leaving behind liquid waste products.

This liquid is moved through the small intestine by peristalsis, a reflexive, wavelike motion of the intestine. (Have you ever felt rumbling in your tummy? That's likely peristalsis.) Stretching of the intestine triggers peristalsis – that's how fiber and other bulking agents cause bowel movements.

As the small intestine absorbs all the nutrients, peristalsis moves the liquid out of the small intestine and into the large intestine, or colon, which is in the shape of an upside-down "U." Here, peristalsis slows down, allowing for water to be reabsorbed and soft stool to be formed. After the needed fluids are reabsorbed from the stool, the large intestine deposits the stool into the rectum. The rectum is a muscle that functions as a "holding area."

At the end of the rectum is the internal anal sphincter, an involuntarily controlled muscle that automatically opens when the rectum is full of stool, making way for the stool to move into the anal canal. This activity triggers a signal that travels to the spinal cord and up to the brain, alerting the individual that a bowel movement is imminent.

The external anal sphincter is a voluntarily controlled muscle at the other end of the anal canal. When the brain receives the signal that stool is moving through the anal canal, a message is sent to the external anal sphincter to contract. It remains closed until the individual signals that it's safe to relax, at which point the stool passes out of the body.

Most people find that they have a routine time for a bowel movement (morning or night). But regularity can be affected by foods, hydration, medication, activity or a change in routine, such as having to use a public bathroom on vacation. Knowing your typical pattern can help prevent any changes in regularity.

Normal bowel movements:

- » Occur one to two times every day.
- » Are soft.
- » Are passed without pain or straining.
- » Occur at socially appropriate times to prevent soiling or accidents.

What Is Constipation?

Constipation can present in many different ways, including the following:

- » Infrequent bowel movements
- » Hard and/or small stool
- » Abnormally large stool
- » Difficult or painful defecation
- » Stool accidents, "skid marks" or smearing of stool in the underwear (encopresis)
- » Taking a long time to pass a bowel movement
- » Clogging of the toilet
- » Passing a bowel movement more than twice a day

What causes constipation in children?

The most common cause is withholding. Children will withhold stool for many reasons, including, but not limited to the following:

- » A response to social issues, such as toilet training
- » Dirty bathrooms
- » Restrooms that aren't private
- » Unavailability of a restroom
- » Preoccupation with playing
- » A past painful defecation
- » Changes in routine or diet
- » A desire to assert independence

How does constipation occur?

When the child withholds stool, the rectum stretches out to accommodate the increasing amount that begins to build up. The longer the stool stays in the rectum, the bigger and harder it gets. (The hardening happens because the body reabsorbs water from the stool as long as stool remains in the body.) As the rectum continues to expand, the child's normal urge to defecate gradually vanishes. This is where it gets tricky: Sometimes, soft new stool can squeeze past the old stool and make it seem like the child is having normal bowel movements and is not actually constipated.

As the cycle is repeated, greater amounts of stool build up in the rectum and bowel. As a result of this chronic retention, the bowel's ability to move stool contents is diminished (decreased motility), causing decreased rectal elasticity and sensation. In other words, children who have chronic constipation lose the ability to sense when the rectum is full and, over time, lose the ability to evacuate stool completely.

1. Stool Retention and Urologic Problems (Bowel Dysfunction)

When the child finally does pass stool, it may be painful because the stool is large and hard. This can turn into a vicious cycle: The pain may cause the child to further withhold out of fear of another painful defecation. As the cycle progresses, some children will begin to have stool accidents, otherwise known as soiling or encopresis.

Stool incontinence occurs:

- » As a result of looser stool leaking or overflowing from a rectum that's been distended by retained stool.
- » When soft or liquid stool leaks around a backup of stool in the rectum.
- » When the child tries to pass gas. When liquid stool leaks around the backup of stool, the child will think he is about to pass gas, when, in fact, what comes out is liquid stool. This will sometimes look like smearing of stool in the underpants.
- » When the muscles used to withhold become fatigued.

Interestingly, boys suffer from stool soiling three to six times more than girls do. This may be because they urinate while standing. When urinating, the pelvic floor muscles relax, which may cause stool in the rectum to be expelled into boys' underwear without their even knowing it. Girls sit when urinating, so if stool is expelled at the same time, it goes into the toilet, not on their pants.

It's important to note that no concerning or significant pathology is found in 90 percent to 95 percent of children with constipation/stool retention. In addition, what causes constipation in adults does not necessarily cause constipation in children. The table below describes some of the differences.

Constipation Differences Between Children and Adults

	CHILDREN	ADULTS
TRANSIT TIME Time between eating food and producing a stool	16 hours	30-48 hours after puberty
BEHAVIOR	Withholding	Straining
INCONTINENCE	Common	Rare
SEDENTARY LIFE	Rare	Common
FIBER IN DIET	Rarely helpful	Helpful

Why is my urology specialist concerned about stool retention?

Stool retention is often the primary cause of urinary tract infections and childhood urinary incontinence.

Studies have shown the following relationships between constipation and urologic conditions:

- » Children with recurrent urinary tract infection often have associated constipation. When the constipation is treated, they get fewer urinary tract infections.
- » Treating constipation in children with diagnosed "hyper bladders" can resolve their uninhibited bladder contractions.
- » Vesicoureteral reflux (see page 11) is more likely to resolve if constipation is treated.
- » Constipated children are often unable to empty their bladder completely and may have dilation of the kidneys. Both issues – residual urine after voiding and kidney dilation – can influence urinary tract infections.
- » Most types of childhood urinary incontinence (both day and night) resolve once constipation is treated.

How do I know if my child has stool retention?

It's very difficult to assess stool retention in children. Most parents don't know their children's bowel habits, and the children themselves are rarely able to give a good bowel history.

Based on the information you and your child are able to provide, plus her history and a physical exam, your urology practitioner may simply assume your child is constipated and treat her accordingly. The practitioner may also want to obtain an X-ray to assess exactly how much stool retention is present. But since an X-ray exposes the child to radiation, we often just presume constipation and treat the child without it.

1. Stool Retention and Urologic Problems (Bowel Dysfunction)

How do I treat my child's constipation and/or stool accidents?

Our recommended treatment has two phases:

1. Clean-Out Phase

The goal of the clean-out is to empty the entire bowel of stool. How long this takes will depend on the amount of retained stool. This phase always requires medication.

2. Maintenance Phase

The goal of the maintenance phase is to maintain an empty bowel by having one to two continent, soft stools per day. This phase will most often involve medication.

Note: Treatment may take several months. A successful outcome depends on having patience and not stopping the therapy too early.

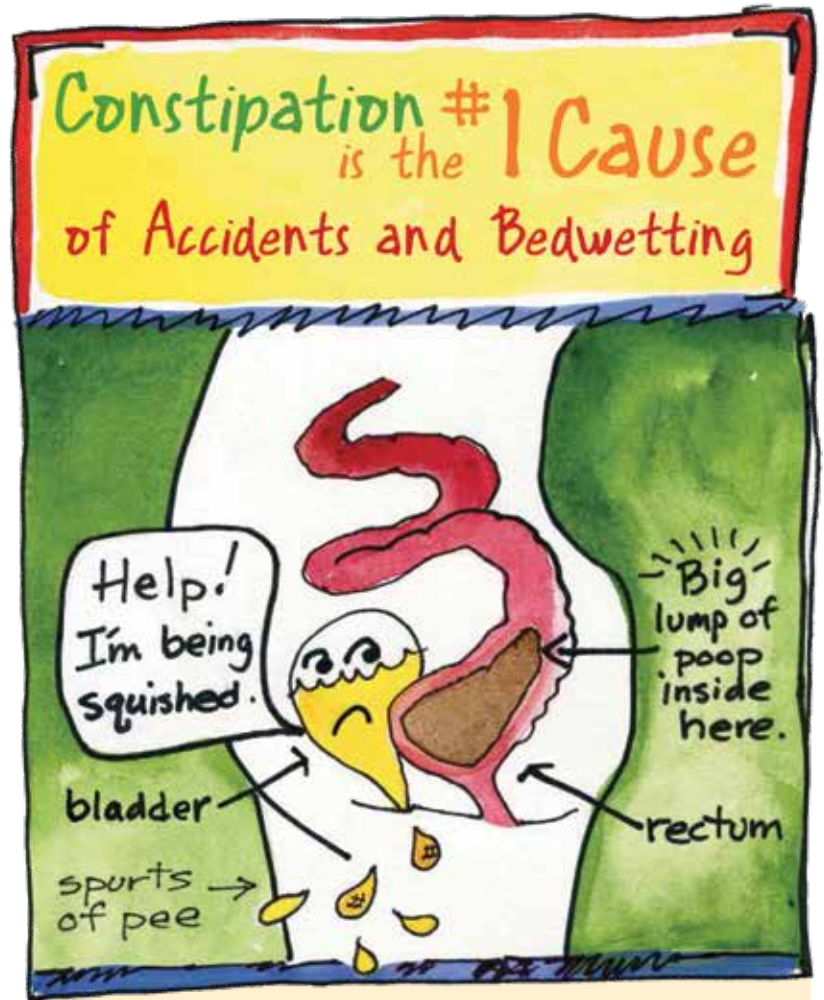
What types of medications are used?

Many different types of medicines can be used to treat constipation, each with its own risks and benefits. Here's a sample list:

- » Osmotic laxatives (MiraLAX), magnesium supplements (magnesium citrate, milk of magnesia), lactulose (Enulose)
- » Stool softeners such as docusate (Colace)
- » Stimulants (senna, ex-lax)
- » Enemas (Fleet, Pedia-Lax), which go directly into the rectum

We generally recommend using osmotic laxatives and enemas, since studies show they are safe and effective and are the least likely to be absorbed into the body (with the exception of the magnesium supplements, which we use only for the clean-out phase). Stool softeners such as Colace are best used to treat constipation in patients who need to avoid straining – after surgery, for example – but not to resolve stool retention.

The primary side effects of all stool medications include soiling, gas, nausea, vomiting, abdominal pain and diarrhea. Fortunately, most children tolerate these medications well and don't actually experience many of these effects.



How Accidents Happen

Child holds poop.
↓
Poop piles up and stretches the rectum.
↓
Stretched rectum squishes and irritates bladder.
↓
Bladder leaks pee.

How to Stop Accidents

Clean out rectum with enemas or laxatives.
↓
Rectum shrinks back to size.
↓
Bladder returns to normal.
↓
Child continues with laxatives and high-fiber diet to keep poop soft.

1. Stool Retention and Urologic Problems (Bowel Dysfunction)

Clean-Out Phase

The clean-out process is typically performed over several weekends, when your child isn't in school. The success of this treatment depends on a successful initial clean-out, which can only be done effectively with medication. The following medications may be used:

- » **MiraLAX (polyethylene glycol 3350)**
MiraLAX is our first choice for the clean-out phase. It's an over-the-counter osmotic laxative, which means it works by increasing the flow of water into the colon to produce softer, easier-to-pass stools. It has no flavor, is very effective and has the least amount of side effects of all the clean-out medications. Side effects may include nausea, cramping, soiling and bloating. It can be difficult to predict how long it will take for the medicine to start working.
- » **Magnesium supplements (magnesium citrate, milk of magnesia)**
This is another osmotic laxative that's available over-the-counter. It's less expensive than MiraLAX, but is not quite as effective and may cause cramping.

Maintenance Phase

After the bowel has been cleaned out, it's important to keep it that way. We do this in the maintenance phase. This may last as long as six months because it can take that long for the intestine and rectum to shrink back down to their normal size, so that stool doesn't accumulate once again. There are three parts to the maintenance phase: medication, diet/fiber and the daily sit.

1. MEDICATIONS

- » **MiraLAX (polyethylene glycol 3350)**
MiraLAX, in smaller doses, can also be used as a maintenance medication to ensure that a child is having one to two soft stools per day. As the bowel regains its elasticity and form, the dose should be gradually decreased. Most children need MiraLAX for the first one to three months of the maintenance program.
- » **Enemas**
An enema is medicine that is administered directly into your child's rectum in liquid form. While this doesn't sound easy or fun, many parents and kids actually prefer this method because it works faster than orally ingested laxatives and provides for a more predictable bowel movement. Most kids say that it isn't painful, that it just feels like pressure inside their bottom.
- » **Lactulose**
Lactulose is a maintenance medication used for chronic constipation. The dose needs to be slowly titrated up, however, until the desired effect is reached (again, one to two soft stools per day). Starting on too high a dose can cause cramping and gas. This medication is by prescription only.

2. DIET AND FIBER

- » **Water:** Increasing a child's daily water intake is an important step in treating constipation, since water helps soften the stool.
- » **Fiber:** There's no direct evidence that increased fiber in the diet is helpful for childhood constipation, although we still recommend that your child get the recommend amounts of fiber by eating plenty of fruits, vegetables and whole grains.
Over-the-counter fiber supplements may bulk up the stool and help produce a bowel movement.
For young children, the powder form might be the best choice, as it can easily be mixed in liquid. Of the powders, Benefiber dissolves best in water or juice, making it more palatable for small children. For older children who can swallow pills, the tablet or capsule form is probably the easiest. For children somewhere in between, wafers would be the best choice.
Keep in mind that the fluid-to-fiber ratio is very important. Not getting enough fluid with the fiber can actually make constipation worse. If using the wafers or tablets, have the child drink the liquid first and then take the fiber; give less fiber if the child doesn't drink all the liquid.
Remember, if you increase your fiber intake, increase your water intake, too. They work together.

3. DAILY SIT

If your child is having stool accidents (encopresis), the daily sit is a crucial element of the bowel maintenance program. It involves sitting on the toilet for 15 to 20 minutes after a meal. Doing this takes advantage of the gastrocolic reflex, which increases the motility of the lower gastrointestinal tract following a meal. Depending on your child's individual situation and the severity of the condition, she should sit on the toilet after breakfast or dinner, or both. Sometimes, depending on the habits of an individual family, we'll have the child eat an afternoon snack and sit on the toilet after that, too. The daily sit is a good time to work on reading skills.
If your child doesn't have a bowel movement within 20 minutes, she may get up. It's okay to get up early, before the time limit's up, if your child has a bowel movement.

What else can I do to help my child?

- » Avoid blame, criticism or punishment for bowel accidents.
- » Always reward your child for following the recommendations, not for success.
- » Encourage your child's teacher to participate in this process, allowing the child to have ready access to a school bathroom.

2. Bladder Dysfunction

The Physiology of Normal Urination

Urination may seem like a straightforward event, but it's actually a complex phenomenon. It involves the coordination of two completely separate systems: (1) the bladder, composed of smooth muscle like the intestine, over which we have no direct control, and (2) the sphincter, composed of a type of muscle like the muscles in our arms and legs, over which we do have control (Figure 1)

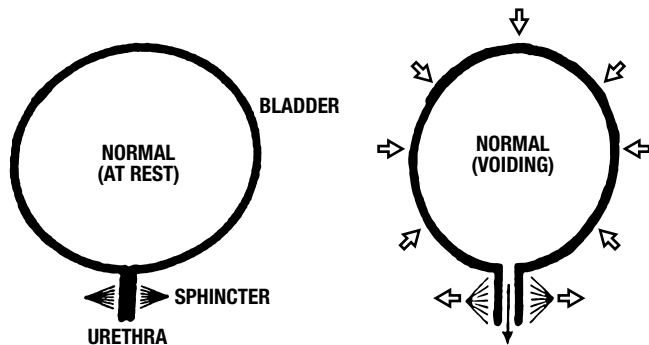


Figure 1. The normal anatomy of the urinary tract, showing the bladder connected to the urethra, through which the urine passes to the outside. The sphincter surrounds the urethra and, by contracting, can shut off the flow completely.

The bladder is remarkable in that it holds large amounts of urine (up to 15-20 oz., or about a pint in a typical adult) with very little rise in pressure. Ideally, the bladder muscle relaxes to increase in size while filling up with urine. When it's full, the bladder muscle begins to contract and signal its desire to empty itself (Figure 2). It doesn't do so immediately, however, in part because the sphincter muscle is in a constant state of contraction to hold the urine in. It relaxes only when the individual is ready to start urinating.

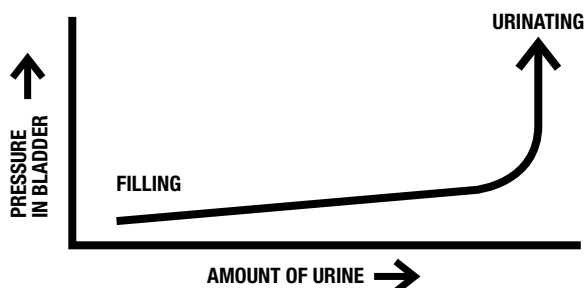


Figure 2. The pressure-volume relationship seen in the normal bladder. As the bladder fills, the pressure rises very little until the stretch limit has been reached, at which time contraction of the bladder stimulates urination.

Normal Urination in Infants

An infant's bladder empties by reflex. Once the bladder reaches a certain level of fullness, a contraction begins. While the brain is aware of this contraction, it doesn't interfere with

this sustained contraction of the bladder. This results in good bladder emptying, which means the bladder empties until there is no more urine. This is called reflex voiding.

Normal Adult Urination

An adult's voiding pattern is very different from an infant's. When an adult feels the beginning of a bladder contraction at an inconvenient time or place, a message is sent from their brain to the bladder that tells it to stop contracting. Once this message is received and the bladder stops contracting, this results in a loss of the urge to urinate.

When it's a socially appropriate time to empty a full bladder, one sits on or stands in front of the toilet or urinal and makes a conscious effort to start urinating. The brain then sends a message to the bladder to begin contracting. An adult will also relax the muscles of the pelvic floor and smoothly empty the bladder to completion.

Abnormal Urination

The infrequent voider

Children ignore the early signs of a full bladder for a variety of reasons. They may be distracted by what they're doing, or they simply may not have developed the ability to interpret the signs that their bladder is full. Once the child's bladder has exceeded its capacity, a powerful contraction will occur that may be especially hard to inhibit. To avoid this problem, children should be encouraged to try to empty their bladder five to six times a day (every two to three hours), *before* they feel the urge to urinate.

Difficulty in inhibiting a bladder contraction

When children are unable to send a message to their brain to stop the bladder contraction, they rely on just the sphincter; this can result in damp pants. Signs of this situation include the child who fidgets, the girl who squats and sits on her heel or the little boy who grabs his genitalia. When this happens and the child is asked if he needs to go to the bathroom and says "no," it is because he doesn't understand what is happening in his body at that time.

Children try various means to overcome a bladder contraction – a condition called voiding dysfunction. This tendency accounts for the difficulty many children experience relaxing their pelvic muscles to facilitate complete bladder emptying. In other words, they're contracting those muscles so often that when they finally do attempt to urinate, they can't relax them. When listening to these children urinate, you'll notice that the flow is interrupted rather than smooth and flowing. Children with this problem are prone to infections and constipation.

2. Bladder Dysfunction

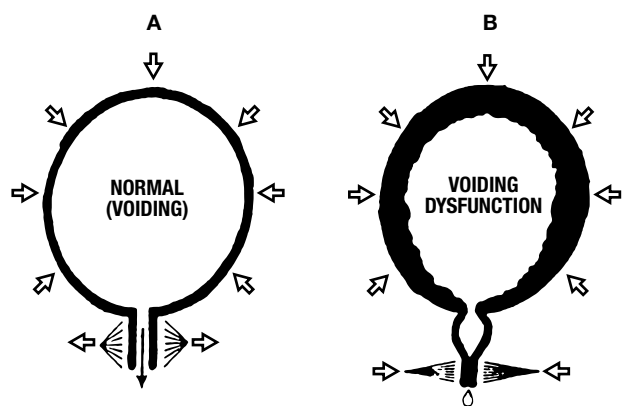


Figure 3A. During normal urination, the bladder contracts and the sphincter relaxes, allowing urine to flow freely from the bladder.
Figure 3B. Children suffering from voiding dysfunction tend to tighten their sphincters as their bladders contract, which interrupts urinary flow.

Failure to empty the bladder

Failing to urinate to completion can be confirmed by listening to the child pee. If the urinary stream stops abruptly, rather than gradually diminishing in force, then the child has unintentionally tightened up the sphincter and hasn't voided completely. To solve this, have the child remain on the toilet and encourage relaxation. Children who don't empty their bladders consistently may feel a constant need to urinate and are at risk for urinary tract infections.

The hyperactive or uninhibited bladder

A small percentage of children who experience problems with continence and urinary frequency or urgency have what is considered a hyper or uninhibited bladder. The hyper bladder contracts after holding less urine than a normal bladder without sending a message to the brain, which can lead to accidents. Some children will simply urinate much more frequently (every 30-60 minutes) but remain dry.

Hyperactive bladder can occur because of infection, emotional stress or other conditions, but more often there's no specific cause. Your child may be prescribed medicine to help the bladder relax.

Vaginal voiding

If you have a daughter who complains of painful urination (without infection); is constantly leaking; gets redness, itchiness or irritation in her private area (sometimes called vaginitis); or leaks urine right after she urinates, she may be experiencing vaginal voiding. Vaginal voiding occurs when a female urinates with her legs too close together, causing urine to wash back up into her vagina – then leak out later. The easiest solution is to teach your daughter to urinate with her legs apart.



2. Bladder Dysfunction

Treatment of Bladder Dysfunction

TIMED URINATION

The purpose of timed urination is to have the child empty his bladder *before* it fills to the point where it triggers a hard-to-stop bladder contraction. This means your child should pee before they feel like they need to. (It's harder than it sounds!) The frequency of urination is influenced by the amount of fluid being taken in, as well as whether or not the bladder is completely emptied with each urination. As a general rule, children should empty their bladder completely five to six times a day, or roughly every two to three hours.

INCREASE WATER INTAKE DURING THE DAY

Many children don't drink liquids at breakfast or at school, which can make them very thirsty in the afternoon and evening. The body – specifically, the kidneys and bladder – needs water regularly throughout the day. Recommended fluid intake for children is based on age and by weight.

Age/Weight	Recommended Fluid Intake
<2 years old/<22 lb.	30-35 oz./day
2-5 years old/<44 lb.	40-50 oz./day
6-12 years old/<110 lb.	50-60 oz./day
Teens/any weight	60-70 oz./day

URINATION WITH RELAXATION

Without good relaxation of the right muscles, children can't empty their bladder completely. When teaching your child to relax while urinating, you may find it helps to have them audibly "sigh" during the process. Sighing is a normal relaxation trigger and makes it impossible for the child to strain at the same time. You can also have your child count or sing.

LEARNING TO EMPTY THE BLADDER COMPLETELY

If you notice an abrupt interruption of the urinary stream, have your child try to relax and urinate again (i.e., double voiding). By listening to the stream, you can determine whether the bladder is being completely emptied. Make sure the child understands that she controls her bladder.

WORK ON STOOL RETENTION/CONSTIPATION

This will require medication for many months (see stool retention/constipation, pages 3-6).

BLADDER MEDICATIONS

The most commonly prescribed pediatric bladder medications are anticholinergics such as Ditropan (oxybutynin) and Detrol (tolterodine). Their main side effects include dry mouth, constipation and facial flushing, but these often resolve over time and occur significantly less with the controlled-release form of the drug. It's important to maintain good oral hygiene while on any of these medications since they may cause a decrease in saliva, which can increase the risk of cavities.

- » **Ditropan (oxybutynin) and Ditropan XL:** Ditropan comes in regular or controlled-release form (Ditropan XL). It has an antispasmodic effect on the smooth muscle of the bladder, which increases the amount of urine that the bladder can hold and helps lessen urinary urgency and frequency. Ditropan comes in pill and liquid form; Ditropan XL comes only in pill form. Ditropan XL must be swallowed whole – never chewed or crushed.
- » **Detrol (tolterodine) and Detrol LA:** Detrol also acts on the smooth muscle of the bladder, allowing it to relax and fill with more urine before the child feels a need to urinate. It comes in regular or controlled-release form (Detrol LA). Detrol is available in pill form.

Note: There's another category of medications, called alpha blockers (e.g., doxazosin), that have been used to treat voiding dysfunction. Ask your urology provider if this option is appropriate for your child.

POSITIVE REINFORCEMENT

Use positive reinforcement to motivate your child to work with the bladder training program. If using a reward system, make following the bladder program the goal, not staying dry. This helps set your child up for success since, although he has not yet learned how to stay dry, he does have control over whether he follows the program or not. When the child independently sticks to the plan, he could be rewarded with a sticker or a gold star on a calendar, or any other reward system. (Bottom line: Reward your child for trying, not for results.)

TIMED URINATION ALARMS

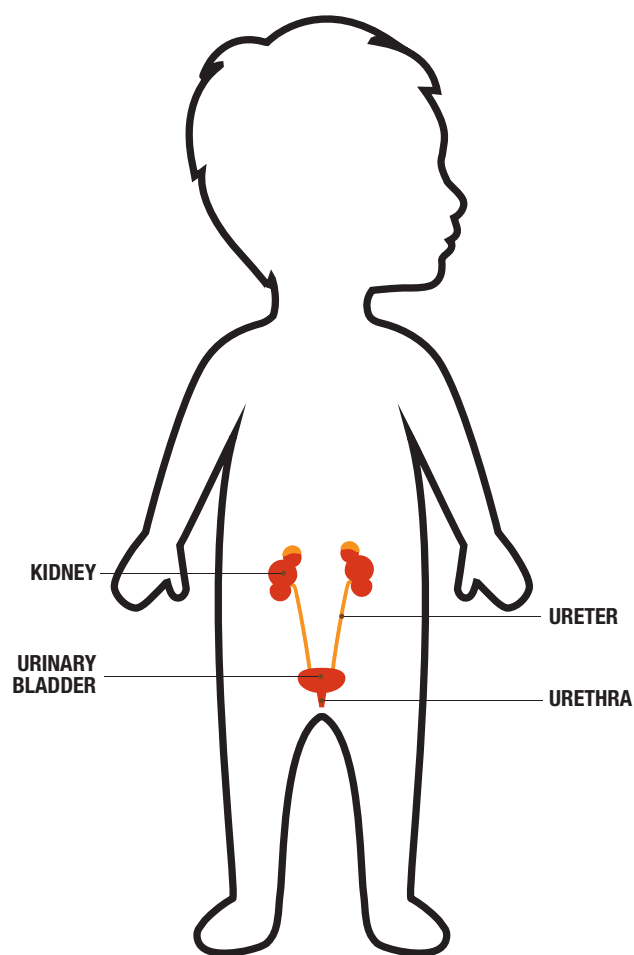
For children who might benefit from a timed urination schedule (e.g., they should attempt urination every two to three hours), we recommend buying a watch with an alarm as a reminder. For younger children, get a watch that will go off without having to be reset.

It's important that you explain to any adult who may be supervising your child – teachers, coaches or camp counselors – that your child must be excused from regular activities and possibly even reminded to use the toilet at the prescribed intervals.

3. Urinary Tract Infection and Vesicoureteral Reflux

What Is the Urinary Tract?

The kidneys filter blood to produce urine, which travels from the kidneys down the ureters and into the urinary bladder, where it's stored until urination occurs. The tube through which urine then passes out of the bladder during urination is called the urethra. The entire passage is called the urinary tract.



What Is a urinary tract infection (UTI)?

A UTI is an inflammation of the bladder or the bladder and the kidneys. It's usually caused by bacteria from the skin outside the urethra moving up the urethra and into the bladder. If the bacteria stay in the bladder, the infection is called cystitis, or "bladder infection." If the bacteria find their way up to the kidneys, it's called pyelonephritis or "kidney infection."

What are the signs and symptoms of a UTI in a child?

The signs of a UTI depend on the child's age.

For infants:

- » Fever
- » Irritability
- » Inconsolable demeanor
- » Vomiting and diarrhea
- » Poor feeding
- » Failure to gain weight

For older children:

- » Burning or pain with urination
- » Frequent or urgent urination
- » Fever
- » Lower-abdominal pain
- » New wetting episodes or more frequent occurrences
- » Side or back pain
- » Blood in urine (visible or seen in urine test)

As children reach toddler age, more classic symptoms appear, such as pain during urination or urinary frequency and urgency. It becomes easier to recognize urinary tract infections as the child becomes verbal and is toilet-trained.

Regardless of age, bladder infection (cystitis) isn't usually associated with fever and generally doesn't cause long-term damage to the bladder or kidneys. However, a kidney infection (pyelonephritis) is usually associated with a high fever and may produce permanent damage or scarring of the kidneys, even after only one infection – especially in a very young child.

Figure 4. Anatomy of the urinary tract.

3. Urinary Tract Infection and Vesicoureteral Reflux

How can you tell if your child has a urinary tract infection?

After you collect a urine specimen, your provider or lab will look at your child's urine with a microscope (urinalysis). To be certain that there's an infection, a urine culture will also be done. Results can take up to 48 hours, and antibiotics will be prescribed.

The method of urine collection will affect the accuracy of the urine culture. It's important to:

- » Wash the skin around the urethra with the cleansing pad to get rid of the bacteria on the skin's surface. Then have the child urinate into a specimen cup. It's best to let a few drops of urine go into the toilet first and collect the middle of the urine stream in the cup.
- » If the urine is collected at home, please keep the sample cold by placing it in the refrigerator and packing it in ice while traveling to the doctor's office.
- » Because bacteria from the skin may contaminate these samples, it may sometimes be necessary to pass a small plastic tube (called a catheter) through the urethra into the bladder to obtain a clean specimen.

Why do children get urinary tract infections?

The most common cause is constipation/stool retention (see pages 3-6). The next most common cause is abnormal urination/bladder dysfunction (see pages 7-8). Some children are genetically more prone to infection than others.

When does a urinary tract infection warrant further testing?

Children who have a *culture-proven urinary tract infection* may need radiologic studies such as an ultrasound of the kidneys and bladder. Depending on the symptoms and frequency of infections, your provider may recommend a voiding cystourethrogram (VCUG) test (see page 15) to rule out vesicoureteral reflux, a condition in which urine travels the wrong way in the urinary tract and ends up back in the kidneys. Vesicoureteral reflux can run in families, or it can be caused by abnormal urination and constipation. Waiting until a child has had multiple urinary tract infections before having an evaluation increases the risk that kidney damage or scarring may occur.



What if my child is diagnosed with vesicoureteral reflux?

Many children will outgrow vesicoureteral reflux, but some may need a surgical procedure to correct it. Surgery won't prevent a bladder infection, but it will prevent the infection from spreading to the kidneys. Children with bowel and bladder dysfunction are less likely to outgrow reflux and more likely to continue to get infections, even while on a daily preventive antibiotic. Children who are treated for constipation are more likely to outgrow their reflux and less likely to need surgery.

How are urinary tract infections treated?

- » All children with a urinary tract infection are treated with a safe and well-tolerated antibiotic. A child who is very ill with a kidney infection may require hospitalization for intravenous antibiotics until the fever goes down and the urine culture results are known. Another urine culture may be done while your child is taking the antibiotic or when the medication is finished to make sure the infection is gone.
- » Some children who have repeat urinary tract infections may need to take a daily low-dose antibiotic for a period of time. This is called a prophylactic antibiotic.
- » Our team doesn't use urethral dilation (stretching the urethra) for UTIs. It was once assumed that many girls who got urinary tract infections had narrow or tight urethras, but we now know that this isn't the case.
- » Treatment for children with vesicoureteral reflux will vary according to the child's age, the number of urinary tract infections and findings on the tests described above. To learn more, contact your urology or pediatric provider.

How can I help prevent urinary tract infections in my child?

Treating constipation/stool retention and bladder dysfunction is highly effective in preventing urinary tract infections (see pages 6 and 9).

4. Nocturnal Enuresis (Nighttime Bedwetting)



What Is Nocturnal Enuresis?

Persistent nighttime enuresis, or nighttime bedwetting, is the involuntary loss of urine during sleep in a child age 5 or older, and it's the most common bladder control issue in childhood. Fifteen percent of 5-year-olds and 10 percent of 6-year-olds experience the problem, but as children get older, there's about a 15 percent reduction each year in the number of children who are wet.

What causes nighttime bedwetting?

The most common causes include constipation (see page 4), bladder dysfunction (see page 7) and a genetic predisposition (it tends to run in families, although this isn't always the case).

Regarding the bladder component, most urologists feel that the difficulty lies with a developmental delay in the bladder's micturition (urination) cycle. These children simply need more time for their nighttime control to fully develop. Just as some children walk and talk before others their same age, bladder control also varies per child.

There are several theories about what causes nocturnal enuresis that *haven't* entirely held up:

1. Psychological problems were once thought to be a cause, but this is no longer believed to be the case.
2. It was once believed that an inadequate production of an antidiuretic hormone (ADH), which concentrates urine in the event of dehydration, was responsible for nocturnal

enuresis. Secretion of this hormone is normally high at night. However, this is no longer believed to be true. Some children do respond to this hormone in medication form (called desmopressin acetate, or DDAVP) in a way that decreases their urine output at night, but some do not. Sometimes children respond for a period of time, and then the medication stops working.

3. Children with enuresis do not sleep any differently than children who don't wet the bed. However, children often wet the bed during deep sleep, which causes parents to think that their child is a deep sleeper.

A physiologic cause for enuresis is unusual in children who:

- » Wet only during sleep.
- » Have never had a urinary tract infection.
- » Do not wet during the day.

A physiologic cause for enuresis might be present in children who:

- » Wet day and night.
- » Have urinary tract infections.
- » Have trouble with bowel control or stool retention.

Many children who visit the doctor for bedwetting issues also have daytime urologic symptoms (e.g., urinary urgency, frequency, accidents). The management of this group varies in some ways from those who are wet only at night.

4. Nocturnal Enuresis (Nighttime Bedwetting)

Evaluation

All children who need treatment for bedwetting benefit from treating stool retention first. An X-ray of your child's abdomen may be recommended to determine if she is retaining stool. If a child with nighttime wetting has a normal history and physical examination, further testing beyond an X-ray is not typically necessary.

Management

Since bedwetting is very common until children reach the age of 7, it's difficult to justify treating nocturnal enuresis in this age group unless it's caused by bowel/bladder dysfunction. At any age, treatment decisions should take into account the extent to which the problem affects the child and her level of motivation. Quite often, the child has no physical abnormality and does not need long-term therapy.

Treatment will always consist of first treating constipation (see page 4) and bladder dysfunction (see page 9). Once these conditions are treated, if the bedwetting persists, we advance to prescribing medication, conditioning or a combination of approaches.

Drug therapy

There's no drug that cures enuresis; medications used in the treatment of enuresis address only the symptoms. When the drug is stopped, the enuresis will usually return unless the child has naturally outgrown the condition. The most commonly used drug is called DDAVP (desmopressin acetate). This drug mimics the natural hormone that tells the kidneys to conserve body water and concentrate the urine.

DDAVP:

- » Promotes water reabsorption, resulting in increased urine concentration and decreased urine output during sleep.
- » Is generally recommended for children over 6 years old.
- » Is available in small pills that can be chewed.
- » Can be used on an intermittent basis for overnight trips and camp outings.
- » Has shown significant improvement in 25 percent to 65 percent of children with enuresis.
- » Has minimal side effects.
- » Has high relapse rates after discontinuing use (about 80 percent).
- » Is used for about three to six months if the child responds positively, then the dose is gradually tapered down over several weeks.

To reduce the risk of fluid overload and electrolyte abnormalities, it's important to use DDAVP only at bedtime. Children must not drink fluids after taking the medication. DDAVP is safe and often effective, but it isn't a cure.

Conditioning

Using a bedwetting alarm is a form of conditioning that's designed to awaken the child when he begins to wet. Repetitively arousing the child during wetting can ultimately condition the child to recognize that urination is about to occur. This teaches the child to suppress the reflex to urinate.

The alarm consists of a moisture sensor that attaches to the inside of your child's underwear. The alarm will vibrate, make noise or both when it senses moisture. We highly recommend an alarm that makes a sound, since that makes it easier for a caregiver to know when the child needs help. For conditioning to succeed, you must help your child wake up completely when the alarm goes off.

Bedwetting alarms can be labor-intensive and require patience. The major causes of failure are poor compliance from the child and/or parents, incorrect use of the alarm and not treating bowel/bladder dysfunction before using the alarm. When there's 100 percent compliance, at least 95 percent of children will stay dry at night in about six to eight weeks.

Methods many parents try before they seek medical attention – such as limiting fluids before bedtime, awakening the child at night at random times and reward or punishment strategies – generally don't work. Children with simple enuresis will outgrow this pattern eventually.

4. Nocturnal Enuresis (Nighttime Bedwetting)

Bedwetting Alarm Instructions

A bedwetting alarm should *never* be used until constipation/ stool retention (proven clear by X-ray or after performing a bowel clean-out; see pages 5-6) and bladder dysfunction (see page 9) are cured.

Please follow these instructions for best results:

1. Buy a bedwetting alarm that makes a loud sound. These are available online (try BedwettingStore.com or Amazon.com). Prices range from \$30 to \$300.
2. Encourage your child's motivation. If the child and family aren't ready and willing to commit to an eight-week period, then it's best to wait until everyone is excited and ready to be dry.
3. Make sleeping arrangements for the next eight weeks. If the parent assisting the child is a sound sleeper, that parent might consider sleeping in the same room with the child.
4. Make sure the child urinates right before bed.
5. Set up the bedwetting alarm:
 - Place the sensor in the child's underwear (no boxers), and then, if you're using Pull-Ups, put one over the underwear.
 - Follow the directions that come with the alarm.
6. Before sleep, the child should chant, "When the alarm goes off, I will wake up completely," 20 times. This will help the child fully awaken with the alarm.
7. The alarm will ring whenever the child begins to urinate while asleep. *Every time the alarm rings:*
 - The parent will wake the child.
 - The child will urinate in the toilet (to empty any urine not emptied when the alarm went off).
 - The child will put on dry underwear and a new Pull-Up.
 - **MOST IMPORTANT:** Children must become completely awake. This may take 15 to 20 minutes. Create a new password each night that your child must remember in the morning, or practice a math problem. Children who don't remember the word in the morning or cannot solve the problem weren't awake enough and will need more activity (shower, walking, talking, etc.) to fully awaken the next night.
8. Repeat the alarm setup and go back to bed.

What to expect: The child will begin to have less urine in the underwear each night. This means that the child is waking up to the alarm more quickly, before emptying the bladder completely. Give rewards for following recommendations and for trying hard to wake up – not for being dry. The alarm will ring less and less with time.

When your child is cured, please consider donating your alarm to the clinic, so another one of our pediatric urology families can use it.



5. Urologic Tests

While these aren't always necessary, your child may need one or more of the following special diagnostic tests to rule out congenital or neurologic causes of incontinence and to decide the best course of treatment.

URINALYSIS

Your child may be asked to urinate into a cup when she arrives at the appointment. The urine is then analyzed in several different ways to check for early signs of diseases such as diabetes, kidney disease or urinary tract infection.

URINE CULTURE

If your child is thought to have a urinary tract infection (UTI), due to either symptoms or a positive urinalysis, a urine culture will be necessary. This can be done using the same urine that's used for the urinalysis. The urine culture tells us what organism is causing the infection, so we can determine the right treatment. It takes two days to get the results.

KIDNEY, URETER AND BLADDER (KUB) RADIOGRAPHY

This test uses standard X-ray technology to take pictures of internal organs. A KUB X-ray can show kidney stones, tumors and stool retention. To a limited extent, it can also help evaluate for any spinal anomalies. Your child will need to hold still while the X-ray machine takes a picture, but there's no discomfort involved.

RENAL BLADDER ULTRASOUND (RBUS)

This is a test used to look at the kidneys, ureters and bladder and detect congenital anomalies, dilation, obstruction, kidney stones and other urinary tract problems. A small lubricated probe is placed on the skin over the area to be examined ("jelly on the belly"). Ultrasounds involve no radiation and are painless.

VOIDING CYSTOURETHROGRAM (VCUG)

This study gives important information about the shape and size of the bladder, the bladder neck (or opening) and ureters (tubes that drain urine from the kidneys into the bladder). It allows us to diagnose reflux (the abnormal backflow of urine from the bladder into the ureter and up to the kidney), and it provides additional anatomic information about the urethra (the tube that takes urine from the bladder outside the body) to make sure there's no blockage. This test is often used to evaluate a child after a urinary tract infection.

During this exam, a small tube or catheter is passed through the urethra (the hole where the urine comes out) and then up into the bladder. The insertion may cause some discomfort or the urge to urinate. The bladder is then filled, through a catheter, with liquid contrast that can be seen on an X-ray monitor. X-rays are taken during filling of the bladder and while the child urinates.

URODYNAMICS

Urodynamics are done for children with incontinence or urinary tract infections in the rare cases when there is a concern that neurological disorders or other problems might be present. For this exam, a special catheter is passed through the urethra into the bladder, and electrodes (similar to those used for an EKG) are painlessly placed on the perineum (near the buttocks). A small catheter is then placed inside the rectum, and the electrodes and the catheters are connected to a computer. While the bladder is slowly filled with liquid contrast, bladder pressure and pelvic floor activity are measured. X-ray pictures for a VCUG may be taken at the same time. This test will give us a better idea of whether or not the bladder is working with the external sphincter in a coordinated fashion and whether there are possible nerve problems.

URINARY FLOW RATE

Your child may be asked to urinate in a special toilet that measures urinary flow rate. By looking at the rate at which urine comes out, we can get a better idea as to whether your child is voiding completely and correctly. Ideally, urinary flow rate resembles a bell curve, with the flow rate peaking mid-urination and ending gradually, not abruptly.

KIDNEY (RENAL) SCAN

This test is not done for incontinence alone, but it may be requested if there's a history of urinary tract infection or after a positive finding on an ultrasound or VCUG. It's used to more closely examine the function and/or drainage of the kidneys. A kidney scan can also show if there is kidney damage or scarring that may have resulted from a previous urinary tract infection.

MAGNETIC RESONANCE IMAGING (MRI)

An MRI provides detailed pictures of soft tissues without the obstruction of overlying bone. It allows us to see if organs are typical in size and position, if there are any growths or lesions and, sometimes, if the organs are functioning normally. An MRI of the spine may reveal a neurologic disorder called tethered spinal cord. Younger children will be given general anesthesia for this test.

6. Resources for Parents

UCSF Benioff Children's Hospitals Pediatric Urology

» www.childrenshospitaloakland.org/urology

BedwettingAndAccidents.com

Support and solutions from Steve Hodges, MD, Pediatric Urologist, Wake Forest School of Medicine

Books for parents available on Amazon.com

- » A website for parents on pediatric bowel and bladder dysfunction
- » *It's No Accident: Breakthrough Solutions to Your Child's Wetting, Constipation, UTIs, and Other Potty Problems*, by Steve J. Hodges, MD, Pediatric Urologist with Suzanne Schlosberg
- » *Bedwetting and Accidents Aren't Your Fault: Why Potty Accid*, by Steve Hodges, MD, and Suzanne Schlosberg

Pedia-Lax products (including over-the-counter enemas)

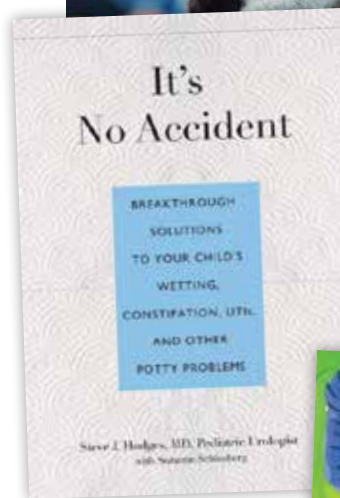
www.pedia-lax.com/products

Watches to remind kids to urinate

www.woblwatch.com

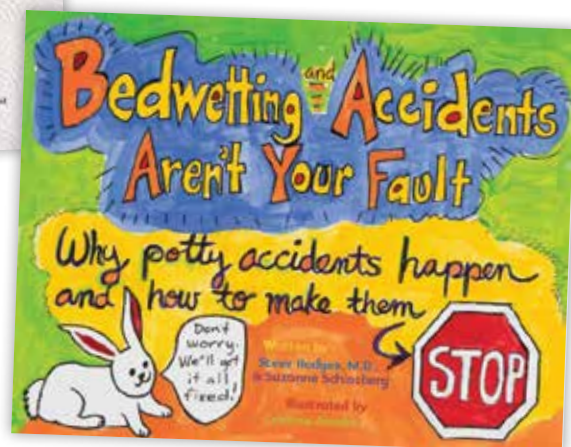
Bedwetting alarms

- » www.pottymd.com
- » www.bedwettingstore.com



Highly Recommended for Parents

It's No Accident: Breakthrough Solutions to Your Child's Wetting, Constipation, UTIs, and Other Potty Problems



Highly Recommended for Parents

Bedwetting and Accidents Aren't Your Fault: Why Potty Accidents Happen and How to Make Them Stop

7. References

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8. Checklist for Referring Providers

1. Bowel Program (check one):

Please consult your provider before starting the bowel program below.

OPTION 1: BEST OPTION

- Children <45 lb.:** MiraLAX 7 capfuls in 32 oz. any liquid over 6 hours (will produce increased/loose stool). Then ½ capful in 4 oz. every day until urology appointment.
- Children ≥45 lb.:** MiraLAX 14 capfuls in 64 oz. any liquid over 6 hours (will produce increased/loose stool). Then 1 capful in 8 oz. every day until urology appointment.

OPTION 2

- Children <45 lb.:** Magnesium citrate solution, 100 mL daily for three days (will produce increased/loose stool). Then Pedia-Lax Chewable Tablets, one to three tablets daily until urology appointment.
- Children ≥45 lb.:** Magnesium citrate solution, 150 mL daily for two days (will produce increased/loose stool). Then Pedia-Lax Chewable Tablets, three to six tablets daily until urology appointment.

OPTION 3

- Children <45 lb.:** Pedia-Lax Enema or saline enema: ½ enema after dinner every evening followed by 15-minute toilet sit, daily until urology appointment.
- Children ≥45 lb.:** Pedia-Lax Enema or saline enema: one enema after dinner every evening followed by 15-minute toilet sit, daily until urology appointment.

2. Leg Abduction

- a. Pull panties/pants/tights all the way down to ankles.
- b. Open legs wide when sitting down to pee (as though you were sitting on a horse).
- c. Lean forward; watch urine stream come out.

3. Tea Baths

- a. Fill bathtub with warm water.
- b. Add five to six black tea bags (e.g., Lipton).
- c. Sit in bath cross-legged for 10 to 15 minutes once or twice daily until irritation resolves.
- d. Rinse bathtub thoroughly to prevent staining.

4. Timed Voiding

Have your child try to urinate every two to three hours during the day, even if they do not feel the urge to urinate.




Consider an alarm watch to remind your child to urinate on a schedule during the day. Otherwise, look at your child's schedule during the day and plan potty breaks accordingly. Many children eat three meals and three snacks. If so, they can urinate every time they eat. When eating, one is usually near a restroom.

5. Increase Fluids During the Day

Age/Weight	Recommended Fluid Intake
<2 years old/<22 lb.	30-35 oz./day
2-5 years old/<44 lb.	40-50 oz./day
6-12 years old/<110 lb.	50-60 oz./day
Teens/any weight	60-70 oz./day

NOTES:

MY POOP CHART

	1.  rabbit pellets
	2.  big ol' logs
	3.  thick and bumpy sausage
	4. Smooth mushy snakes 
	5. mushy blobs 
	6.  lumpy gravy
	7.  diarrhea



A GUIDE TO TREATING YOUR CHILD'S Daytime or Nighttime Accidents, Urinary Tract Infections and Constipation



UCSF Benioff Children's Hospitals Pediatric Urology Clinic Locations

Greenbrae

1300 S. Eliseo Dr., Suite 204
Greenbrae, CA 94904
(415) 353-2200

Oakland

744 52nd St.
Oakland, CA 94609
(510) 428-3402

San Mateo

101 S. San Mateo Dr., Suite 205
San Mateo, CA 94401
(415) 353-2200

Modesto

1444 Florida Ave., Suite 100
Modesto, CA 95350
(415) 353-2200

San Francisco

1825 Fourth St., Fifth Floor
San Francisco, CA 94158
(415) 353-2200

Walnut Creek

2401 Shadelands Dr.
Walnut Creek, CA 94598
(510) 428-3402

To make an appointment or check the status of a referral please call: 877-UC-CHILD (877-822-4453)

Oakland outpatient fax (510) 985-2202
San Francisco outpatient fax (415) 353-4485