

VOIDING DYSFUNCTION

PATTERNS OF ABNORMAL VOIDING

The pattern of abnormal voiding behavior seen in children can be quite variable. Some children hold the urine for extensive periods, overstretching their bladders, yet when they finally do urinate, they urinate with perfectly normal coordination. Other children have difficulty relaxing the sphincter during urination and void against the sphincter, straining the bladder muscle extensively in the process. The outcome is inefficient voiding. All of these abnormal voiding patterns may also be associated with constipation. These patterns collectively are referred to as dysfunctional elimination syndrome (DES).

EFFECTS OF VOIDING DYSFUNCTION/DYSFUNCTIONAL ELIMINATION SYNDROME (DES)

Infection occurs commonly with voiding dysfunction. The normal bladder is remarkably resistant to infection under ordinary circumstances because of its ability to wash out and thus eliminate bacteria with every urination. If, however, urine is held too long or is incompletely discharged, bacteria may increase.

The high pressure generated by muscles straining against themselves may break down the one-way mechanism of urine flow which normally prevents urine from going back up into the kidneys from the bladder. It may also impede the flow of urine from the kidneys into the bladder.

Urination occurs then, not because we voluntarily contract the bladder, but rather because we release the bladder, while it is under tension, by relaxing the sphincter. So fundamental to urination is the cooperation between bladder and sphincter that the activity is carefully coordinated by the nervous system through a reflex arc centered in the base of the brain. Newborn infants do it automatically. What then goes wrong in children with voiding dysfunction?

ABNORMAL VOIDING AND VOIDING DYSFUNCTION

Although an individual cannot willfully contract his bladder muscle, he can willfully contract his sphincter muscle. In some respects, it is simple to stop urination than it is to start it. As infants grow into children and become more aware of their bladders they are overcome with the desire to control their bladders and not wet themselves every time the bladder reflex is ready to kick off. They learn to do this very early in life by overriding the normal tendency of the sphincter to relax; they forcibly contract their sphincter instead, thus preventing any urine from escaping.

This forced contraction of the sphincter to hold urine back is a normal reaction of children to prevent wetting and is not particularly harmful provided that the child uses those few moments to get to the bathroom where he can relax the sphincter and let the urine escape.

If, however, the child continues to maintain his sphincter contracted against a straining bladder, an unhealthy situation develops in which the two muscles strain against one another. Over time, the bladder wall may reach two to three times its normal thickness

because of enlargement of its muscle fibers which now stand out like the muscles of weight lifters.

WHY DO CHILDREN DEVELOP VOIDING DYSFUNCTION?

Although voiding dysfunction appears to be an acquired disorder (i.e., they are not born with it), the cause is not always clear. In general, these children tend to be bright, busy, even hyperactive at times. Because proper voiding requires relaxation above all else, it is understandable that a busy child, anxious to get back to play, may not take the time to perform the act of urination as conscientiously as he should. Furthermore, any social or family pressures may interfere with proper relaxation.

HOW IS VOIDING DYSFUNCTION DIAGNOSED?

In most instances, voiding dysfunction can be diagnosed by the characteristic history of holding the urine back until the last minute, voiding explosively or intermittently, or involuntary wetting. The history often begins around the time of potty training as a child first begins to exert voluntary control over urination.

HOW CAN VOIDING DYSFUNCTION BE TREATED?

Because voiding dysfunction is basically a lack of coordination between the bladder and sphincter, the key to treatment centers on a voiding retraining program. Fortunately, the normal reflex which coordinates bladder and sphincter is so strongly ingrained in the nervous system that all that is required is to stop the voluntary overriding of the sphincter and allow the system to go back to its normal function. However, this may not be easy. The pattern of tightening the sphincter may, by now, be well established in the child and the thickened bladder muscles may be particularly difficult to hold back. Nonetheless, with proper attention to a bladder retraining program, the abnormal pattern of voiding can be broken and the normal pattern restored.

Bladder retraining is based on the principle of taking all the pressure off the bladder to allow its strained muscles to recover. To do this, two important principles are incorporated into the bladder retraining program:

1. Frequent voiding
2. Complete voiding

The time of voiding should be determined in advance and one should rigidly adhere to the schedule. Generally, a voiding schedule of every 2 hours during the day is selected and marked on a voiding calendar or diary (see Figure 1), and the child should then be sent to the bathroom at the appointed time without regard to his perception of whether or not he needs to void.

This voiding routine is effective, however, only if the bladder is emptied completely. The stretched smooth muscle of the bladder will empty the bladder completely if released and allowed to do so without interruption. But if contraction of the sphincter occurs during voiding, interrupting the stream and the bladder contraction, the bladder contraction may be lost. The bladder, though still not empty, may not be under the tension it was at the beginning of urination and thus possibly may not be started again.

The child is likely to announce that he has finished and is ready to go out and play again, even though his bladder is still half full.

In general, if a child voids every 2 hours and empties his bladder completely, he will keep the pressure in his bladder down to a level where the muscles will recover and normal function will be restored.

The expenditure of time and energy to normalize voiding in these children can be exhausting to the parents and child alike, and there is a decided tendency to quit these training sessions in favor of simpler or less time consuming approaches. The parents will often tell the child to do this himself or else rely on medication to correct the problem. The result of such short cuts is inevitably failure. There is no substitute for the discipline required in voiding by the clock, concentrating on a continuous stream at every void, and maintaining careful records in a voiding diary. Progress can be slow at times, but only with proper dedication to the effort can success be achieved.

QUESTIONS FREQUENTLY ASKED ABOUT VOIDING DYSFUNCTION

- **Q. Will surgery be required?**
 - A. This is a problem in coordination not an anatomical disease; thus, the primary disorder is not amenable to surgery. Consequences of voiding dysfunction, however, may require surgery.
- **Q. How long is treatment required?**
 - A. This varies depending on the specific type of voiding dysfunction present and the secondary changes that may have occurred. Usually, improvement is evident quickly, but complete reversal of the basic abnormal habit pattern takes months. Generally, the family should be expected to commit 6 months to 1 year to the retraining program.
- **Q. Do relapses occur?**
 - A. Relapses are common during the early treatment phase and are usually due to a lapse in following the retraining program vigorously. Once a pattern of normal voiding is established, however, it is usually durable.
- **Q. Will my child outgrow this?**
 - A. Yes. In fact, many children will finally outgrow the problem and acquire the necessary coordination spontaneously, even without treatment. This may take some time, however, and significant psychological and even organic urinary tract damage may occur in the interim. Thus, aggressive, early treatment seems justified.
- **Q. My child seems to have to go to the bathroom every 15 minutes. How will a program of voiding every 2 hours help this?**

- A. Most children's bladders will hold 2 hours of accumulated urine without any difficulty. If he has to void more often than this, it is usually due to one of two problems. The first is that he may not be emptying his bladder when he goes but instead is just squeezing a little off the top so that he quickly fills back up to capacity. The other possibility is that the bladder has been strained to the point it has gone into spasm and will not stretch.
- **Q. My child can't seem to feel the need to urinate. The urine just runs out without his seeming to realize it. Does he have something wrong with his ability to feel?**
- A. Probably not. We feel sensations because of the change in pressure on pressure receptors. Push your eyeglasses up over your forehead and leave them there. After a while you will no longer notice them because there is no longer any change in pressure upon the scalp. You feel the bladder full because it feels different from an empty bladder. If the bladder stays full all the time, this sensation of fullness gets lost. Usually, as the bladder begins to empty more effectively, the normal sensation of empty and full begins to return.

Modified from: Parents Primer to Normal and Abnormal Voiding in Children National Kidney Foundation of Texas.

Figure 1: Toilet Diary

TOILET DIARY

Please mark a “**U**” for each urination in the toilet, “**BM**” for each bowel movement in the toilet, “**A**” for each urine accident, and “**S**” for each bowel accident. Indicate beside “**BM**” or “**S**” if the stool was hard, normal, or loose and if the amount was small, medium, or large.

DATE					
TIME	Day 1	Day 2	Day 3	Day 4	Day 5
7 AM					
8 AM					
9 AM					
10 AM					
11 AM					
12 NOON					
1 PM					
2 PM					
3 PM					
4 PM					
5 PM					
6 PM					
7 PM					
8 PM					
9 PM					
10 PM					
11 PM					
Overnight					

Comments: _____

