ENURESIS (BEDWETTING)

Key Concepts

- Definition of Bed-Wetting
- Causes of Bed-Wetting
- Assessment of Bed-Wetting
- Investigation and treatment of Bed-Wetting

Abstract

Bedwetting refers to the unintentional passage of urine during sleep. It is a common disorder from 5-15 years of age. There are two types of bedwetting such as primary and secondary. The causes of bedwetting are multiple like urinary tract infection, diabetes mellitus, structural and anatomical abnormality and emotional problems. Assessment of children with bedwetting have examination and investigation for diabetes and urinary tract infection. The treatment options range from home remedies to drugs or even surgery.

Key words: Enuresis, Betwetting Alarms, Imipramine DDAVP.

Definition

Bedwetting is the unintentional (involuntary) discharge of urine during the night. Although most children between the ages of three and five begin to stay dry at night, the age at which children are physically and emotionally ready to maintain complete bladder control varies. Enuresis is a technical term that refers to the continued, usually involuntary, passage of urine during the night or the day after the age at which control is expected.

Bedwetting, or nocturnal enuresis, refers to the unintentional passage of urine during sleep. Enuresis is the medical term for wetting, whether in the clothing during the day or in bed at night. Another name for enuresis is urinary incontinence.

For infants and young children, urination is involuntary. Wetting is normal for them. Most children achieve some degree of bladder control by 4 years of age. Daytime control is usually achieved first while nighttime control comes later. The age at which bladder control is expected varies considerably.

- Some parents expect dryness at a very early age, while others not until much
later. Such a time line may reflect the culture and attitudes of the parents and caregivers.

- Factors that affect the age at which wetting is considered a problem include the following:
  - The child’s gender: Bedwetting is more common in boys.
  - The child’s development and maturity
  - The child’s overall physical and emotional health -- chronic illness and/or emotional and physical abuse may predispose to bedwetting.

**Bedwetting is a very common problem.**

- Parents must realize that enuresis is involuntary. The child who wets the bed needs parental support and reassurance.
- About 5-7 million children in the United States wet the bed. Most children simply outgrow bedwetting with a rate of resolution of the issue of about 15% per year.
- The prevalence of childhood primary enuresis is:
  - 5 years old 16%
  - 6 years old 13%
  - 7 years old 10%
  - 8 years old 7%
  - 10 years old 5%
  - 12-14 years old 2%-3%
  - over 15 years old 1%-2%
- Bedwetting is a treatable condition.

While children with this embarrassing problem and their parents once had few choices except waiting to "grow out of it," there are now treatments that work for many children.

Several devices, treatments, and techniques have been developed to help these children stay dry at night.

**Bedwetting Causes**

While bedwetting can be a symptom of an underlying disease, the large majority of children who wet the bed have no underlying disease. In fact, a true organic cause is identified in only about 1% of children who wet the bed. However, this does not mean that the child who wets the bed can control it or is doing it on purpose. Children who wet the bed are not lazy, willful, or disobedient.

There are two types of bedwetting: primary
and secondary. Primary bedwetting refers to bedwetting that has been ongoing since early childhood without a break. A child with primary bedwetting has never been dry at night for any significant length of time. Secondary bedwetting is bedwetting that starts again after the child has been dry at night for a significant period of time (at least six months).

In general, primary bedwetting probably indicates immaturity of the nervous system. A bedwetting child does not recognize the sensation of the full bladder during sleep and thus does not awaken during sleep to urinate into the toilet.

The cause is likely due to one or a combination of the following:

- The child cannot yet hold urine for the entire night.
- The child does not wake up when his or her bladder is full.
- The child produces a large amount of urine during the evening and night hours.

The child has poor daytime toilet habits. Many children habitually ignore the urge to urinate and put off urinating as long as they possibly can. Parents are familiar with the "potty dance" characterized by leg crossing, face straining, squirming, squatting, and groin holding that children use to hold back urine.

Secondary bedwetting can be a sign of an underlying medical or emotional problem. The child with secondary bedwetting is much more likely to have other symptoms, such as daytime wetting. Common causes of secondary bedwetting include the following:

- Urinary tract infection: The resulting bladder irritation can cause lower abdominal or irritation with urination (dysuria), a stronger urge to urinate (urgency), and frequent urination (frequency). Children may indicate another problem, such as an anatomical abnormality.
- Diabetes: People with type I diabetes have a high level of sugar (glucose) in the blood. The body increases urine output as a consequence of excessive blood glucose levels. Having to urinate frequently is a common symptom of diabetes.
- Structural or anatomical abnormality: An abnormality in the organs, muscles, or nerves involved in urination can cause incontinence or other urinary problems that could show up as bedwetting.
- Neurological problems: Abnormalities in the nervous system, or injury or disease of the nervous system, can upset the delicate neurological balance that controls urination.
- Emotional problems: A stressful home life, as in a home where the parents are in conflict, sometimes causes children to wet the bed. Major changes, such as starting school, a new baby, or moving to a new home, are other stresses that can also cause bedwetting. Children who are
being physically or sexually abused sometimes begin bedwetting.

- Sleep patterns: Obstructive sleep apnea (characterized by excessively loud snoring and/or choking while asleep) can be associated with enuresis.
- Pinworm infection: characterized by intense itching of the anal and/or genital area.
- Excessive fluid intake.
- Bedwetting tends to run in families. Many children who wet the bed have a parent who did, too. Most of these children stop bedwetting on their own at about the same age the parent did.

**Bedwetting Symptoms**

Most people (80%) who wet their beds, wet only at night. They tend to have no other symptoms other than wetting the bed at night.

Other symptoms could suggest psychological causes or problems with the nervous system or kidneys and should alert the family or health-care provider that this may be more than routine bedwetting.

- Wetting during the day
- Frequency, urgency, or burning during urination
- Straining, dribbling, or other unusual symptoms with urination
- Cloudy or pinkish urine, or blood stains on underpants or pajamas
- Soiling, being unable to control bowel movements
- Constipation

Frequency of urination is different for children than for adults.

- While many adults urinate only three or four times a day, children urinate much more frequently, in some cases as often as 10-12 times each day.
- "Frequency" as a symptom should be judged in terms of what is normal for that particular child.
- Equally important, "infrequent voiding" (less than three times urinating/day) can be a sign of other underlying problems.

Fecal impaction may present as constipation. Both fecal impaction and constipation cause straining, which can injure the nearby urinary sphincters, muscles that control flow of urine out of the body.

- Fecal impaction occurs when feces becomes so tightly packed in the lower intestine (colon) and rectum that passing a bowel movement becomes very difficult or even impossible. If the stool is passed, it is often a painful experience.
- The hard, tightly packed feces in the rectum can press on the bladder and surrounding nerves and muscles, interfering with bladder control.
- Neither fecal impaction nor constipation is that unusual in children.
- A strict bowel regimen can often alleviate bedwetting.

The decision of when to involve your health-care provider is variable -- most commonly it is based upon how the situation is affecting the child as well as the parents. If the child displays only nighttime wetting without any other symptoms, then the
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decision about when to seek medical treatment is up to the family.

- It is probably a good time to seek medical help when the child is 5-7 years of age.
- Referral to psychologist is likely not needed for most children with no other symptoms. This is a reasonable problem for the child’s pediatrician to handle.

A child should be checked without delay for an underlying medical problem if he or she develops any other physical or behavioral symptom.

The health-care provider will ask many questions about the child’s symptoms and about many other factors that can contribute to bedwetting. These include the following:

- The pregnancy and birth
- Growth and development, including toilet training (both urine and stool)
- Medical conditions. Specific attention is focused on the following:
  - Wetness of underwear: indicates day and nighttime enuresis
  - Palpating stool in the abdomen: indicates possible constipation or other obstruction
  - Excoriation of genital or vaginal area: possible scratching due to pinworms
  - Poor growth and/or high blood pressure: possible kidney disease
  - Abnormalities of the lower spine: possible spinal cord abnormalities
  - Poor urinary stream or dribbling: possible urinary abnormalities
  - Medications, vitamins, and other supplements
  - Family history if one or both parents were enuretic, approximately one-half to three-quarters of their offspring may also wet the bed. Identical twins are twice as likely to both be enuretic when compared to fraternal siblings.
- Home and school life: recent stress, how this problem is affecting the child and family, any attempts at therapy which have been tried
- Behavior
- Toilet habits: Record a voiding diary (daytime pattern and volume of urine, to determine bladder volume) and stool diary (to evaluate for constipation).
- Nighttime routines
- Diet, exercise, and other habits:

There is no medical test that can pinpoint the cause of primary enuresis. Secondary enuresis more commonly reflects underlying pathology and thus warrants laboratory and possibly radiologic evaluation.

- A routine urine test (urinalysis) usually is performed to rule out any urinary tract infection or kidney disease.
- An X-ray of the kidneys and bladder may be done if a physical problem is suspected. Occasionally, MRI examination of the lower spine/pelvis is indicated.

Management

Generally, medical professionals divide bedwetting into uncomplicated and complicated cases.

- Uncomplicated cases consist of only bedwetting with no other symptoms, a normal urinary stream, and no daytime urination complaint or soiling. These children have a normal physical examination and urinalysis findings.
- Complicated cases may be any of the following: wetting in relation to another disease or condition, problem in urinating, soiling or daytime urinary
incontinence, or urinary tract infections. These children require further evaluation.

Children who have complicated bedwetting may be referred to a specialist in urinary tract problems (urologist) for further evaluation.

**General principles**

Bedwetting is typically seen more as a social disturbance than a medical disease. It creates embarrassment and anxiety in the child and sometimes conflict with parents. The single most important thing parents can and should do is to be supportive and reassuring rather than blaming and punishing. Primary nocturnal enuresis has a very high rate of spontaneous resolution of approximately 15% per year.

Many treatment options range from home remedies to drugs, even surgery for children with anatomical problems.

- **Underlying medical or emotional conditions should first be ruled out.**
- **If there is an underlying condition, it should be treated and eradicated.**
- **If bedwetting persist once these steps are taken, however, there is considerable debate as to how and when to treat.**

Treatment of uncomplicated bedwetting is not appropriate for children younger than 5 years of age.

- **Because a majority of children 5 years and older spontaneously stop bedwetting without any treatment, many medical professionals generally choose to observe the child until age 7.**
- **The age at which to treat, then, depends on the attitudes of the child, the parents/caregivers, and the health-care provider.**

**Self-Care at Home**

Here are some tips for helping your child stop wetting the bed. These are techniques that are most often successful.

- **Reduce evening fluid intake.** The child should try not to take excessive fluids, chocolates, caffeine, carbonated drinks, or citrus after 3 p.m. Routine fluids with dinner are appropriate.
- **The child should urinate in the toilet before bedtime.**
- **Set a goal for the child to get up at night to use the toilet.** Instead of focusing on making it through the night dry, help the child understand that it is more important to wake up every night to use the toilet.
- **A system of sticker charts and rewards works for some children.** The child gets a sticker on the chart for every night of remaining dry. Collecting a certain number of stickers earns a reward. For younger children, such a motivational approach has been shown to provide significant improvement (14 consecutive dry nights) in approximately 70% of children with a relapse rate (two wet nights out of 14) of only 5%.
- **Make sure the child has safe and easy access to the toilet.** Clear the path from his or her bed to the toilet and install night-lights. Provide a portable toilet if necessary.
- **Some believe that you should avoid using diapers or pull-ups at home because they can interfere with the motivation to wake up and use the toilet.** Others argue that pull-ups help the child feel more independent and confident. Many parents limit their use to camping trips or sleepovers.

The parents' attitude towards the bedwetting is all-important in motivating
Focus on the problem: bedwetting. Avoid blaming or punishing the child. The child cannot control the bedwetting, and blaming and punishing just make the problem worse.

Be patient and supportive. Reassure and encourage the child often. Do not make an issue out of the bedwetting each time it happens.

Enforce a "no teasing" rule in the family. No one is allowed to tease the child about the bedwetting, including those outside the immediate family. Do not discuss the bedwetting in front of other family members.

Help the child understand that the responsibility for being dry is his or hers and not that of the parents. Reassure the child that you want to help him or her overcome the problem. If applicable, remind him that a close relative successfully dealt with this same issue.

The child should be included in the clean-up process.

To increase comfort and reduce damage, use washable absorbent sheets, waterproof bed covers, and room deodorizers.

Self-awakening programs are designed for children who are capable of getting up at night to use the toilet, but do not seem to understand its importance.

One technique is to have the child rehearse the sequence of events involved in getting up from bed to use the toilet during the night prior to going to bed each night.

Another strategy is daytime rehearsal. When the child feels the urge to urinate, he or she should go to bed and pretend he or she is sleeping. He or she should then wait a few minutes and get out of bed to use the toilet.

Parent-awakening programs can be used if self-awakening programs fail. These programs should only be used at the child’s request.

The parents should awaken the child, typically at the parents’ bedtime.

The child must then locate the bathroom on his or her own for this to be productive. The child needs to be gradually conditioned to awaken easily with sound only.

When this is done for seven nights in a row, the child is either cured or ready for self-awakening programs or alarms.

Bedwetting alarms have become the mainstay of treatment.

Up to 70% of children stop bedwetting after using these alarms for 12-16 weeks.

About 20%-30% start wetting the bed again when the alarm is discontinued (relapse). However, the positive response to reinstating the alarm system is rapid due to the behavioral conditioning experienced during the first treatment cycle. With persistence, this method works for 50%-70% in the long run.

These alarms take time to work. The child should use the alarm for a few weeks or even months before considering it a failure.

There are two types of alarms: audio and tactile (buzzing) alarms.

The principle is that the wetness of the urine bridges a gap in the sensor, which in turn sets off the alarm. The sensor is placed either on the child’s underwear or bed pad.

The child then awakens, shuts off the alarm, finishes urinating in the toilet, returns to the bedroom, changes clothes and the bedding, wipes down the sensor,
resets the alarm, and returns to sleep.

- Alarms are preferred over medications for children because they have no side effects.
- It is generally believed that all children of 7 years and older should be given a trial of an alarm.
- For the alarm to be effective, the child must desire to use it. Both the child and parents need to be highly motivated.

Beware of devices or other treatments that promise a quick "cure" for bedwetting. There really is no such thing. Stopping bedwetting is, for most children, a matter of patience, motivation, and time.

**Medical Treatment**

After an organic cause has been ruled out, there is no medical urgency to treat the child. Bedwetting tends to go away by itself. Discuss the treatment options with your child’s health-care provider; together you can decide whether treatment is right for your child.

Several drug therapies are available.

- These are typically reserved for children who have not stayed dry by using the alarms.
- Adults with bedwetting often take medications. They may have to stay on the medication indefinitely.
- The drugs do not work for everyone, and they can have significant side effects.
- The two drugs have been approved by the U.S. Food and Drug Administration (FDA) specifically for bedwetting: imipramine (Tofranil). Others, which are not specifically approved for bedwetting, are oxybutynin (Ditropan, Urotrol) and hyoscyamine (Cystospaz, Levsin, Anaspaz).

Medical opinion is divided on using drugs to treat bedwetting. Many believe that, since the child will outgrow the bedwetting anyway, the risks outweigh the benefits of taking the drugs.

**Medications**

- It has been in use for the treatment of bedwetting for about 10 years and is generally the first medication prescribed.
- This drug imitates ADH in the body, which is secreted by the brain; it increases the concentration of the urine and reduces the amount of urine formed. It is recommended to be taken just before going to bed.
- Its main use is for children who have not been helped by an alarm. It is also used as a stopgap measure to help children attend camps or sleepovers without embarrassment.
- DDAVP comes as a pill and is taken before bedtime. Side effects are uncommon but include headache, runny nose, nasal stuffiness, and nosebleeds. A previously manufactured nasal spray form is generally not used since it is more likely to be associated with potentially severe side effects.
- The dose is adjusted until effective. Once it is working, the dose is tapered if possible. About 25% of children with enuresis will have total dryness with desmopressin, while approximately 50% will have a significant decrease in bedwetting. When compared with alarm devices, however, approximately 60% of patients will return to bedwetting when DDAVP administration is stopped.

Imipramine is a tricyclic antidepressant that has been used to treat bedwetting for about 30 years.

- How it works is not clear, but it is known...
to have a relaxing effect on the bladder and to decrease the depth of sleep in the last third of the night.
- Initial cure rates range from 10%-60%, and it has a relapse rate of up to 80%.
- Side effects tend to be rare with correct dosage, but nervousness, anxiety, constipation, and personality changes have been reported.
- It can have toxic side effects if taken improperly or as an accidental overdose. Deaths have been attributed to accidental overdoses -- most commonly associated with abnormal heart-rhythm patterns.
- It may be combined with desmopressin if desmopressin alone is not effective.

Oxybutynin and hyoscyamine are medications that reduce unwanted bladder contractions. They help relieve daytime urgency and frequency in addition to uncomplicated bedwetting. Their side effects include dry mouth, drowsiness, flushing, heat sensitivity, and constipation.

Other Therapy
Bladder training exercises: These are useful for adults with bedwetting or other types of urinary incontinence. They do not usually work for children. A recent review of complementary and alternative medicine (CAM) therapies (for example, acupuncture, hypnosis, etc.) in bedwetting shows little encouragement for the use of these modalities.

Follow-up
For a child with an underlying medical or emotional cause for the bedwetting, the health-care provider will recommend an appropriate treatment for the underlying condition.
- If the treatment recommendations of the provider are followed closely, the bedwetting will stop in most cases.
- Keep in mind that for some underlying conditions, such as anatomical problems or emotional problems, the treatment may be complex and take some time.
- Children with uncomplicated bedwetting usually "grow out of it" on their own.
- If you decide to try treatment, try to follow the recommendations of the child’s health-care provider.
- Relapse rates can be high, but retreatment is typically successful.
- Your child’s health-care provider will monitor the child’s progress periodically. How often depends on how quickly the bedwetting improves and your comfort level with that rate.
- Commitment and motivation are needed if the treatment is to be successful.

Prevention
There really is no way to prevent bedwetting.

Outlook
Bedwetting can damage the child’s self-image and confidence. The best way to prevent this is to be supportive. Parents should reassure the child that bedwetting is a common problem and that they, the parents, are confident that the child will overcome the problem.

Every year, 15% of school-aged children who wet the bed become dry without specific treatment.
- Although 15%-20% of 5-years-old wet their beds, only 7% of 8-years-old wet the bed.
- It is estimated that 1% of adults wet their bed regularly.
- It is difficult to estimate the effectiveness of treatment, but cure rates range from 10%-
60% with drugs to 70%-90% with alarms and parent awakening.
- Nearly all bedwetting problems can be cured with single or combination therapy.
- Some people do, however, need to have long-term drug therapy.

References: