

Topic Page: [Enuresis](#)

Definition: **enuresis** from *Merriam-Webster's Collegiate(R) Dictionary*

 [pronunciation](#)

(ca. 1800) : the involuntary discharge of urine :incontinence of urine

en•uret•ic \--re-tik\ *adj or n*



Image from: [Why we sleep is not yet fully understood. That we... in Curriculum Connections Psychology: The Brain](#)

Summary Article: **Enuresis**

From *Cambridge Handbook of Psychology, Health and Medicine*

Diagnosis

The term 'enuresis' is used when a child, beyond the age of anticipated bladder control and socially correct toileting behaviour, urinates into clothing or other inappropriate places. The defining age is usually considered to be five years. Whether the urinating is intentional or involuntary is not relevant to the general diagnosis. However, involuntary urination during the night, in a child who has never ceased to wet the bed (or has lost a previously acquired skill) is referred to as 'nocturnal enuresis', and colloquially as 'bedwetting'. Nocturnal

enuresis is one of the commonest reasons for families seeking help from primary care physicians. The problem was referred to as early as the sixteenth century in *The boke of chyldren* by Thomas Phaire, in a chapter entitled 'Of pissing in the bedde'.

'Diurnal enuresis' is the term for involuntary daytime urination. It occurs in approximately 1 in 10 of the children with nocturnal enuresis. A distinction is also made between children who are 'regular' and those who are 'intermittent' bedwetters. Most enuretic children have what is called 'primary' nocturnal enuresis, meaning that they have wet their beds since toddlerhood. 'Secondary' enuresis is the term applied to children who revert to bedwetting after a sustained period of dry beds. Although urinary tract infections or diabetes may play a role in secondary enuresis, it is often impossible to identify any specific medical cause. It may, however, be associated with psychological causes such as problems at home (e.g. a divorce) school (e.g. bullying), or other life stresses that precipitate a regression.

Assessment

Although most children with enuresis are physically normal, they will usually (and preferably) be physically examined by a primary care physician or paediatrician to exclude medical conditions. The doctor may arrange for urine tests to check for infections or other abnormalities, if any disorders are suspected. Constipation is sometimes associated with enuresis, occasionally involving soiling of underwear ('encopresis') in serious cases. Usually, mild constipation is remedied by simple dietary measures, but severe cases of constipation may require intensive treatment before the enuresis can be tackled. Primary enuresis may be associated with other disorders such as attention deficit hyperactivity disorder (ADHD) and sickle cell anaemia (Herbert, 2003) (see 'Hyperactivity' and 'Sickle cell disease').

Children with enuresis are at risk of having, or developing emotional and behaviour problems. Clinical psychologists have the particular behavioural skills that are needed for assessing and treating enuresis, and (if required) encopresis. Some cases continue (if untreated) into late adolescence and even

adulthood.

Toilet training: incidence of bedwetting

A child might be considered toilet trained when s/he is able to use the toilet (or potty) reasonably independently, perhaps with assistance over adjusting clothing. There is much variation in the age at which children achieve control between and within different cultures. Knowledge of the norms (averages) in typical development, while bearing in mind that there is a wide range of individual differences, might help parents feel more relaxed about the 'implicit' timetable for the development of continence. There is no one age at which children cease to wet the bed (see Murphy & Carr, 2000).

Control of the bowels is attained before bladder control. The developmental sequence is generally as follows:

1. bowel control at night
2. bowel control during the day
3. bladder control during the day
4. bladder control at night.

The sequence may vary for children; some achieve bowel and bladder control 'simultaneously'. Girls tend to be quicker than boys in becoming continent. Lack of control is frequently seen in children in residential establishments.

Causation

Causation in enuresis is multifactorial, involving medical, developmental, psychosocial, or genetic causes factors (see Butler, 1998; Clayden *et al.*, 2002):

1. *Medical causes* of enuresis might include (*inter alia*), urinary tract infection, diabetes, urinary tract obstruction, or neurogenic bladder (i.e. a bladder with impaired nerve function). Physiological causes may involve small functional bladder capacity, or a deficit in the amount of antidiuretic hormone (ADH) produced. The presence of this hormone concentrates urine and prevents the bladder from filling up during sleep. Among uncommon physical causes are chronic renal or kidney disease, diabetes, tumours and seizures. Such potentially important causes should make an expert physical examination a matter of routine.
2. *Developmental influences*: some enuretic children suffer from developmental delays other than incontinence; also an above average likelihood of a learning disability. (Herbert, 2003). A high level of 'skill' is needed before the bladder can be controlled during sleep, so it is perhaps not surprising that some children do not achieve it with ease, especially when disabled or under stress.
3. *Psychosocial causes* (see Herbert, 2003): enuresis may have its origins in faulty learning. Some cases of enuresis are related to toilet training that was begun too early, or carried out in a very forcible manner. Young children lack a sufficiently mature signalling mechanism between the bladder and the brain to become aware of a full bladder. Consequently, they fail to wake up and wet the bed. Punishment is inappropriate. In fact, children with enuresis are most likely to have their toilet training initiated late. Enuresis may be an adjustment problem (notably in the sensitive period when the child is trying to learn control) as a result of high levels of life-stress. Both harsh 'pressurizing' of the child, or (conversely) complacent neglect of training, may lead to the failure of

this development. Parents who are very controlling and quick to find fault may also trigger problems with bladder control (Table 1) (Herbert, 1996). Emotional problems may be superimposed when the child is made to feel acute shame at his or her 'babyish' ways. Children at risk of becoming bedwetters (mainly girls) tend to come from lower socioeconomic groups, and from large families living in overcrowded conditions. Mothers who give birth as teenagers constitute a further predisposing factor. In most cases, the causal mechanisms that underlie the risk factors (causal associations) are not known.

4. *Genetics*: enuresis often runs in families. Of children with nocturnal enuresis, 70% have a parent who was late in becoming dry. About twice as many boys as girls suffer from enuresis. The concordance rate for identical twins is 68% and 36% for fraternal (non-identical) twins. Molecular genetic evidence has not yet implicated a single gene. The most likely conclusion in our present state of knowledge is that the genetic influence in nocturnal enuresis is heterogeneous. (Clayden *et al.*, 2002).

Enuresis in adults

Nocturnal enuresis in adulthood is probably related to a nerve problem that affects bladder function, or a problem with the hormonal secretion by a gland at the base of the brain. A urological examination is likely to include an evaluation for a structural (anatomic) abnormality. There are medications (depending upon the cause of the problem) that can remedy the incontinence, treatment that may possibly have to be taken for a lifetime in order to remain effective. Young adults (teenagers) with enuresis often have a parent who had the same problem at about the same age.

Table 1. Frequency of bedwetting

Age in years	Approximate number of children in every 100 who wet the bed
2	75
3	40
4	30
5	20
6–9	12
10–12	5
15	1–2

Treatment

The treatment of enuresis falls into three categories: counselling; behavioural methods; and medication. Often, more than one treatment is used at the same time (see reviews of methods and their effectiveness by Butler, 1998; Clayden *et al.*, 2002; Doleys, 1977*a,b*; Murphy & Carr, 2000; Ondersma & Walker, 1998; Shaffer, 1994; Walker, 1995). The evidence suggests that:

- (i) counselling: alone this is rarely effective.
- (ii) behavioural treatments are generally effective; these include:
 - a. incentives (tangible and symbolic rewards) for achieving bladder control;

- b. bladder training such as graduated delay of bladder emptying to increase bladder control;
- c. conditioning methods, such as a urine alarm that wakens the child when s/he wets a pad to which it is connected;
- d. decreasing fluids taken at night;
- e. teaching the child to attend and respond to bladder sensations at night.

The most successful treatments available are the 'urine alarm' and 'dry bed' systems. The urine alarm system attaches a moisture sensor attached to the child's night-time underwear, and a small speaker on a bedside table or on the shoulder of the child. A very small amount of urine activates a loud alarm that causes the child to tense reflexly, thus inhibiting the flow of urine. The parent escorts the younger child to the toilet in order to complete the urinating. Adherence to this programme should produce a positive outcome, with the child waking up 'unprompted' after 4 to 6 weeks of treatment. Reliable bladder control is usually achieved after around 12 weeks of training. At such a time the backup alarm is no longer required. Many clinicians prefer to begin treatment with the use of incentive sticker (reward) charts, adding a urine alarm if the child does not respond to this so-called 'operant method'.

The evidence for the superiority of the urine alarm method (with rates of remission between 80 and 90%) over no-treatment and other-treatment control procedures, is well documented for nocturnal enuresis (e.g. Doleys, 1977*a,b*). Although there was an average relapse rate of 40%; nearly 60% of these returned to continence after booster sessions. In another study of 127 enuretic children (Van Londen *et al.*, 1995), 97% in a urine alarm programme which was supplemented with immediate contingency (operant/rewards) management, were continent compared with 84% of the group that received delayed contingency management and 73% who received a routine enuresis alarm programme. Only 8% of the first group had deteriorated after two-and-a half years (see 'Behaviour therapy').

A meta-analysis of 78 studies by Houts *et al.* (1994), while reporting that the highest success rates for psychological programmes were those using urine alarms, also found the alarm method to be no more effective than the medical treatments (tricyclics and desmopressin) at post-treatment. However, they were significantly superior at follow-up.

(iii) medication: Tricyclic drugs (somewhat out of favour because of adverse side effects and poor results) and desmopressin are used in the treatment of enuresis. Desmopressin is available as a nasal spray administered before bedtime. Continence is achieved relatively quickly in 70% of children; another 10% show significant improvement. It is only effective while the child is on medication; relapse occurs when it is discontinued. Children require a behavioural intervention before they can be taken off desmopressin.

Medication alone is often the first treatment of choice by physicians, a preference not supported by the evidence. Clayden *et al.* (2002, p. 804) state, in an extensive review, that 'it is puzzling that medication is so often preferred to the alarm when the latter is more effective, safer and less expensive'. It has to be said that despite the potential of urine alarm methods, problems of a technical nature can reduce their success. For example, sweat may trigger the alarm; batteries go flat; the child's clothing and bedding are not prepared properly; inconsistency on the part of exhausted parents; insufficient expert monitoring of the programme; premature withdrawal of therapy and so on. Butler (1998) provides an excellent review of the advantages of the enuresis alarm, and some of the practical

difficulties that can hinder the usual expectation of success.

Conclusions

The findings on enuresis reviewed above suggest that:

- (i) Urine alarm-based methods (the so-called 'bell-and-pad' apparatus) is the most effective treatment for enuresis.
- (ii) A contingency management programme, where children obtain rewards for avoiding bedwetting (see 'Behaviour therapy') can be effectively used alone, but is more successful when applied in combination with the urine alarm procedure.
- (iii) Such programmes require a psycho-educational element so that parents (of necessity involved in their implementation) receive adequate explanations and rationales for the procedures, as well as painstaking instructions for their correct use.
- (iv) To meet these objectives, a detailed guide describing behavioural and combined methods of treating nocturnal and diurnal enuresis has been prepared for practitioners and parents (by Herbert, 1996).

(See also 'Children's perceptions of illness and death' and 'Incontinence'.)

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