

# ENURESIS

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## Introduction

Enuresis is perhaps one of the most common pediatric problems all over the world. Yet, considerable variation and confusion exists with regard to the diagnostic criteria, treatment approaches and even degree of concern displayed towards it. The following is an attempt to review the various aspects of enuresis in order to assist those who render primary care to children.

## Definition and Diagnosis

All children are expected to eventually attain bladder control as a part of biological maturation. It is well known that the age at which this control is achieved varies from person to person. However, various cultures and groups arbitrarily fix an age by which such a control **should be** achieved. If a child is not dry by the time he/she passes that age, intervention is deemed necessary. Also the **frequency** of wetting that is considered as abnormal has varied from once a month to several times a week, depending upon the degree of tolerance of the adults around the child. The **time of wetting** further complicates the issue. Although the definition of enuresis should include both day or night wetting, it has been customarily used to imply night wetting, the more common of the two types. The day wetting has often been spoken of as "diurnal incontinence". Some clinicians have approached the diagnosis by asking if the child ever attained full bladder control before the onset of wetting. If bladder control has never been attained it is characterized as "primary" enuresis, and if the child has started to wet after having been dry for a while it is termed "secondary" enuresis. This distinction reflects a presumption about the underlying cause as "constitutional" in the case of Primary Enuresis and environmental (child's regression to a behavior pattern of earlier years in the face of environmental stress) in the case of Secondary Enuresis.

The American Psychiatric Association (APA), in a monumental effort to establish specific criteria for diagnosis of various psychiatric conditions, pub-

lished the third revision of its Diagnostic and Statistical Manual (often called the DSM III).<sup>1</sup> The American Psychiatric Association recognized that clinical research can be meaningful only when conducted with samples of patients selected on the basis of well defined objective criteria for diagnoses. With this in mind they recommended that the diagnosis of Functional Enuresis be made only when the following criteria are met:

- (A) Repeated involuntary voiding of urine by day and night.
- (B) At least two such events per month for children between the ages of 5 and 6 and at least one such event per month for older children.
- (C) Not due to physical disease such as diabetes or seizure.

The committee of the American Psychiatric Association that drafted the above criteria admitted that they were "arbitrary" while emphasizing the necessity for having uniform criteria. They also recommended the use of one or more of the following prefixes to the diagnosis of enuresis whenever applicable.

- i. "Primary"—(if **not** preceded by a dry or continent period of at least one year).
- ii. "Secondary"—(if preceded by a dry or continent period of at least one year).
- iii. "Nocturnal"—(if wetting occurs only at night—most common form).
- iv. "Diurnal"—(if wetting occurs only during the day time).
- v. "Mixed"—(if wetting occurs during the day **and** night).

Different children, thus, can have any one of the following diagnoses:

Primary Nocturnal Enuresis  
Primary Mixed Enuresis  
Secondary Nocturnal Enuresis  
Secondary Diurnal Enuresis  
Secondary Mixed Enuresis

The first two (A and B) of the criteria stated above, though arbitrary, are necessary and logical for meaningful research with uniformly applicable criteria. The third criterion (C), however, may not be so easy to apply. Although diabetes and seizure disorder have been mentioned as examples in the DSM III, a survey of the literature revealed that a variety of other organic conditions can cause<sup>2</sup> wetting as well. These include, urinary tract infec-

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tions, obstructive uropathies (such as urethral valves, neurogenic bladder and ectopic ureter, etc., with 2-4% of the group being enuretic,<sup>2</sup> chronic renal failure, sickle cell anemia/trait (? by osmotic diuresis),<sup>3</sup> and interruption of nerves such as myelomeningocele<sup>3</sup>. Recently, some of the sleep disorders, such as "NREM Dysomnia",<sup>4</sup> hypersomnias<sup>5</sup> (i.e. narcolepsy) and sleep apnea,<sup>5</sup> have been attributed the potential to cause wetting, though the causal link is not yet fully established. Mentally retarded children, because of delay in physical maturation in many instances, may require different criteria altogether. It is also unclear if recognition of physical evidence of developmental immaturity such as "low functional bladder capacity" as the cause of primary wetting would exclude it from a diagnosis of "Functional Enuresis". The requirement to rule out the organic conditions, thus, adds a demanding condition before the wetting is assumed to be functional.

### Prevalence

The figures available from various epidemiological studies are not reliable due to variation in the definition of the condition (which DSM III hopes to rectify in future studies). However, it appears to be more common in the USA (than in Europe), in lower socioeconomic groups, in deviant populations, in boys (as opposed to girls) and in younger age groups (decreasing with increasing age).<sup>6</sup> Odds of a child being enuretic increase if either parent was enuretic and increase further if both parents were enuretic.<sup>7</sup>

### Etiology

The cause of functional wetting is essentially unknown. Several valuable pieces of information are available, however, and point to certain directions. Gross<sup>3</sup> gathered extensive data in the National Health Examination Survey, and noted that enuretics often displayed physical attributes that suggested "developmental immaturity" or delay in the maturation process. These features included generally lower average height, lower bone age. Enuretic adolescents, in addition, showed delayed sexual maturation. These characteristics appear to delineate a group of primary enuretics. Early electroencephalographic sleep studies showed some promise but as the number of children who were studied increased, it became clear that children wet several times at night during all stages of sleep.

The association of psychological factors with enuresis stems from observations made during psychotherapy and pertains mostly to cases of "secondary enuresis". It is often conceived as a manifestation if "regression" (return to earlier

modes of behavior) caused by stress following traumatic experiences such as hospitalization, parental divorce, death in the family, etc.

Toilet training practices (coersive, over-indulgent, inadequate) have been implicated as eventually helping develop a dependent and infantile relation with a parent, which is then manifested as immature behavior, including enuresis.

Some children show depression and other forms of deviant behavior such as delinquency, fire setting, etc. There is little information, however, about the exact nature of the relationship and extent of the association of enuresis and such behaviors.

### Treatment

Treatment starts with a thorough diagnostic evaluation which includes a thorough history, physical examination and necessary investigations to rule out physical causes of wetting as outlined above. This may, at times, necessitate consultation with other specialists such as a neurologist, a urologist or a psychiatrist. It should be recognized that the enuretics are perhaps a heterogenous group with different causes underlying wetting by the different individuals. As such, no single treatment can be recommended with any degree of confidence or certainty of success. Some **supportive measures**, however, can and should be employed in all cases. These, basically, include educating the parents in order to promote an attitude of understanding on their part. For example, the information that the "problem" is common and not unique to patient's family may reduce the sense of guilt among parents and may decrease the consequent attempts to blame and even to punish the one imagined to be responsible for bringing "the defect" in the family. Similarly, helping the parents to recognize that some children overcome the problem spontaneously gives them hope and a positive attitude. It is also important to help parents accept that the child is not doing it "willfully" or "intentionally". This reduces the often unreasonable attempts to punish the child in order to assert parental authority and control. In addition to supportive therapy and reassurance, many children will benefit from attempts at **bladder training**. It is often useful to have the patient void at bedtime. Occasionally, a parent may awaken the child to void again. On weekends or other times when the patient is not in school, drinking larger than usual amounts of fluids and attempting to hold urine as long as possible to learn bladder control is sometimes helpful. An alternative therapy is the use of **conditioning devices**. These are typically buzzers or bells which awaken the patient to help inhibit urination. They work by placing an

especially made pad in the child's bed. When the patient begins to urinate, the moisture completes a circuit triggering a buzzer to awaken the child. These devices are widely available and are usually used for 1 or 2 months. If no improvement occurs with these forms of therapy, then a trial of **drug therapy** may be given.

The drug with the most established anti-enuretic effect is imipramine although some anti-cholinergic compounds have been reported to have variable benefit. Despite imipramine's clinical efficacy which has been established in over 40 controlled trials, its mechanism of action is obscure. The starting dose of imipramine is generally 10 to 50 mg/day and may be increased up to 75 mg (or up to 1 to 2.5 mg per kg of bodyweight). Rapoport's<sup>8</sup> work indicates that positive effects are likely if the blood level of desipramine (a metabolite of imipramine) reaches 150 ng/ml or higher. Because this drug is rapidly absorbed and often produces sedative effects when used during the day it may be prescribed as a single bedtime dose. Another reason for administration at bedtime is convenience. The side effects, if they occur at all, are frequently minor in severity and usually do not necessitate discontinuing the drug. The most frequent ones are related to the drug's anti-cholinergic effects and include dry mouth and blurred vision. Others are drowsiness, changes in appetite, and occasionally irritability or headaches. Recently, some concern has been expressed about the adverse effect of the medication on the heart and an EKG is recommended to assess cardiac functioning.

Most patients may require imipramine treatment for about 3 months, but it can continue much longer if necessary. At least every 6 months, the

drug should be discontinued to assess its further need. It should be noted that there are true drug nonresponders. Some patients will not benefit from imipramine therapy regardless of dose. The monitoring of therapy should include questioning to determine the reduction in frequency of wet nights and the presence and incidence of side effects. Despite claims of high response rate to this treatment, relapse rates are reported to be high (up to 50%) as well. **Hypnosis** is a seldom utilized method of treatment but good results have been reported.<sup>9</sup>

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