

## Current Practice

### URINARY TRACT DISEASES

#### Childhood Enuresis

ROY MEADOW,\* M.A., M.R.C.P., D.C.H.

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Enuresis is a worldwide cause of parental anxiety, childhood tears, and doctor insecurity. The insecurity is because of the apparent inevitability with which many children wet their beds and the way in which, despite energetic management, some of them continue to wet. But while prevention and 100% cure may not be in a doctor's power he can certainly lessen the parental anxiety and the childhood tears.

The term enuresis is given to inappropriate voiding of urine at an age when control of micturition is to be expected. Children achieve bladder control at about the age of 3 years—when a child has learnt to walk and talk he then learns bladder control. By the age of 3½ over three-quarters are dry by day and night. Primary enuresis refers to a child who has never learnt to be consistently dry. Secondary or onset enuresis refers to the situation when someone who has been reliably dry starts wetting again.

#### Prevalence

Between 10 and 15% of 5-year-olds wet their beds at night (nocturnal enuresis). By 10 years the figure is down to 5%, and by 15 years 1%. Though most of the 5-year-olds have primary enuresis, after 6 secondary enuresis is more common, and usually a 10-year-old boy with nocturnal enuresis has had a period in earlier years when he was consistently dry. Enuresis is commoner in boys than girls, and also in first-born children. In Britain it is twice as common in social class V as social classes I or II.

Day-time wetting (diurnal enuresis) is present in less than 10% of the children with nocturnal enuresis. Without treatment most enuretic children will be dry by the age of 15; a few adults still wet their beds, and others relapse after excessive drinking.

#### Origins

Enuresis is a symptom and its origins may be multiple.<sup>1</sup> Family studies show that enuresis frequently occurs in other members of the family. There is a greater frequency of primary enuresis in both of identical twins than in both of non-identical twins, and probably the familial occurrence results from a genetic or constitutional factor as well as from environmental ones. In the same way that there can be a familial tendency for late walking, so there can be a familial tendency for late bladder control.

Enuretic children tend to empty their bladder more frequently during the day than continent children, but they do not actually pass more urine. Their bladders may be slightly smaller. Stress and anxiety undoubtedly result from

enuresis, but they also play a part in causing it. A recent stressful event such as admission to hospital or maternal separation is often associated with the onset of secondary enuresis.

Stress is also an important cause of primary enuresis during the sensitive learning period for bladder control (2½-3½ years). At the age of 3—when the child would be achieving bladder control—arrival of a new sibling, a change of home, or any cause for anxiety interferes with the normal learning process. The optimal period for learning bladder control passes, and though the stress may have been transient the symptom of enuresis may persist. If it persists long enough it will generate enough anxiety itself to convert the family situation into one where learning bladder control is very difficult for the child. The symptom has persisted though the cause has changed. This theory is well supported by studies of enuretic children. Nocturnal enuresis is associated with both the severity of stresses in the first four years of life, and the total number of stressful events. However strong the case that anxiety and stress are causally related to enuresis, enuretic children are not severely disturbed and usually do not show major psychopathology. They and their families react normally to a troublesome symptom and are worried about it.

It has been claimed that enuretic children sleep very deeply. Nevertheless, the importance of this has been exaggerated, for E.E.G. studies have shown that wetting usually occurs when sleep is light or the child is awake. There have also been various reports of minor genitourinary abnormalities being responsible for nocturnal enuresis in many children. Some of the suggestions such as phimosis, and long foreskin have passed into mythology. Other minor anomalies of the urethra or bladder are difficult to evaluate since the interpretation of cystourethrograms and endoscopy findings is very subjective, varying considerably between different radiologists and different surgeons. The variety of minor anatomical abnormalities and the discrepancy between different series cast doubt on their significance, and have led most genitourinary surgeons to believe that children with nocturnal enuresis generally have no physical defect and that correction of minor anatomical abnormalities rarely makes any difference.

Organic causes for enuresis do exist. They range from major anatomical faults such as ectopic ureter to diseases such as diabetes mellitus and urinary tract infection. All except the last are rare in childhood. Urine infections are common, and a striking feature of recent surveys on school populations is the high incidence of wetting problems in children with "asymptomatic" bacteriuria.<sup>2</sup> All children with a wetting problem should have their urine cultured to exclude infection; this is particularly important if the wetting is diurnal.

#### Examination

A full history and examination are important in the management of the enuretic child. Even though the doctor knows

\* Senior Lecturer, Department of Paediatrics and Child Health, University of Leeds, and Honorary Consultant Paediatrician, United Leeds Hospitals.

that an organic cause is unlikely, the parents may not know this and the process of history taking coupled with examination and explanation will relieve a lot of parental and child anxiety. Important points to elucidate are whether the child has ever been dry. If he "wets all the time except when staying with Aunt Effie" one can be sure that the mechanics of the urinary tract are in order, and that conditions such as ectopic ureter or obstructed urethra can be excluded, for in these constant dribbling is a feature. If the enuresis is of recent onset or is diurnal it is particularly important to look for a stress in the home or in school which it may be possible to alleviate. One boy was cured of enuresis by advising his mother to cut his hair short like the others at school—the "goldilocks" teasing had been the main stress.

Going through the history with the mother and searching for aetiological clues—familial or developmental—is not just an academic exercise for the doctor. The mother is often greatly helped by understanding the multifactorial origin of the wetting, in that she no longer feels so guilty. Many mothers feel that neighbours and relatives covertly criticize them for having failed to train their children to be dry.

Physical examination is similarly reassuring to the parent and the older child. It should include abdominal palpation, particularly of the bladder and renal areas, and also examination for spina bifida occulta. The external markers of spina bifida occulta over the lower spine range from a small dimple, haemangioma, or lipoma to the easily recognized tuft of hair. Up to 10% of children have spina bifida occulta, but unless there are neurological symptoms or signs they are not relevant to the problem of enuresis. As a minimum the child's gait and ankle reflexes should be tested.

### Investigations.

The urine must be tested. Microscopic examination for white cells and bacteria is a useful screening test, but to exclude infection a fresh cleanly collected specimen must be cultured. A Dipstix test for glucose will exclude diabetes. A spine x-ray film is not indicated unless there are neurological signs or symptoms. Intravenous urography and cystography are not indicated at first unless there is a strong suggestion of a major anatomical fault.

### Therapy

Most of the patients will be children with nocturnal enuresis who have neither neurological nor genitourinary defect. They will be healthy children with sterile sugar-free urine, who wet their beds at night. It is the treatment of this important group that will be considered under the headings of general care, drugs, enuresis alarms, and second opinion.

### General Care

The most important things for the doctor to give are concern, involvement, and time to listen and explain. Regardless of the methods used the arrival of an enthusiastic new doctor cures a lot of bed wetters. One 60-year-old paediatrician claims that children would get dry much faster if treated by his registrar. Explanation about cause and about how common the problem is will help the family. If the parents are worried about a school refusing to admit a bed wetter it is worth telling the story of the public school headmaster who when asked if a bed wetter should be expelled said "certainly not, it's the boys who have been bed wetters who get all our scholarships."

The mother's attitude is important. Excessive scolding and punishment merely increase anxiety at home. The emphasis should be on praise and possibly rewards for dry nights

rather than blame for wet ones. While it is easy for a doctor to advise a mother not to be angry, it is also very easy to appreciate how these mothers must feel after days of washing bed-clothes and nights of changing them. The subject of rewards for dry nights is well dealt with by Jolly,<sup>3</sup> who has several helpful practical points, such as giving a reward also to the other sibling. Some children are helped by keeping a calendar or chart of the dry nights—the dry nights should be indicated, not the wet ones, for the emphasis to be on success. But for anxious children chart keeping may produce too much worry, with the whole family studying it each breakfast time.

Fluid restriction makes very little difference to whether a child wets. Apart from ensuring that the child does not have several bottles of squash each evening, normal fluid intake should be allowed. Lifting or potting the child when the parents go to bed may not necessarily train the child to get dry, but it certainly may produce the same net result for the parents—dry sheets in the morning. There is no need to wake up the child fully for this—indeed, some young children will refuse to use the pot even though they have full bladders if they are deliberately roused from sleep. Unfortunately lifting or potting seldom solves the problem of bed wetting, as many children successfully potted at 10 p.m. will be wet again by 6 a.m.

Interval training to increase tolerance to a large bladder is worth trying, particularly if there is any suggestion of frequency of micturition or wetting during the day. The child is made to pass urine hourly, the parent accompanying the child to check that this is done. Thereafter the interval is increased by half-hourly or hourly amounts until the child is only going every five or six hours. At this stage nocturnal enuresis sometimes stops.

### Drugs

Drugs hold a fairly dishonourable position in the history of enuresis treatment. The variety of drugs used is enough to cast doubt on their efficacy. However, recently some drugs have emerged with apparent advantages over their predecessors and in controlled trials have proved superior to placebo. These are the tricyclic antidepressants. The most frequently used are imipramine (for example, Tofranil) and amitriptyline (for example, Tryptizol and Saroten). Both are available as a syrup as well as a tablet. Imipramine is the cheapest and is most economically prescribed as Tabs imipramine *BP*. For a 5- to 12-year-old, 25 mg. at night is given, and for older children 50 mg. If there is no improvement after two weeks the dose is doubled. An anxious child is sometimes helped by a small morning dose also. Side-effects such as constipation or drowsiness are uncommon. Even though the child may become dry, relapse is common and the drug should be continued for 3 to 4 months before it is gradually tailed off.

The mode of action of the antidepressant drugs in enuresis is uncertain. The effect starts some days after starting the drug, when the antidepressant action is maximal, so their action is likely to be central rather than anticholinergic.

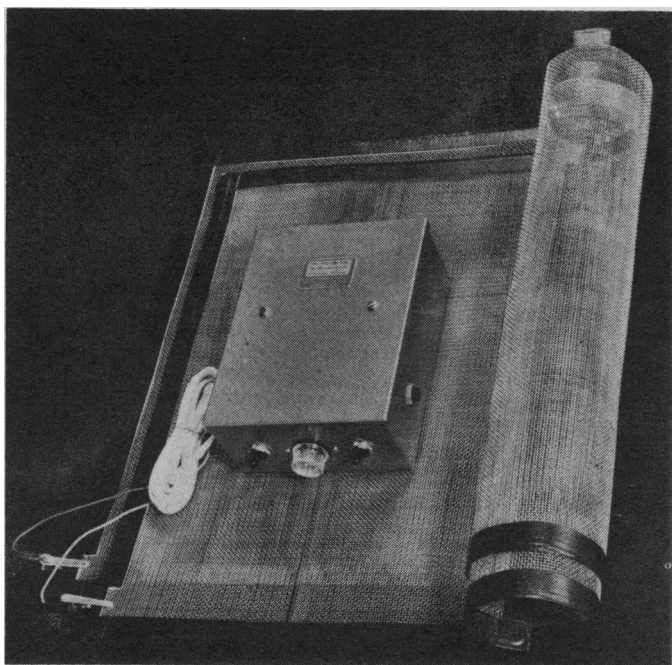
Primarily anticholinergic drugs, such as belladonna and propantheline, which might be expected to relax the bladder muscle are rarely worth using for nocturnal enuresis, but may ease diurnal frequency. Pituitary snuff produces a few dry nights for some children, but rarely any lasting cures, and stimulant preparations such as amphetamine and ephedrine produce more bad tempers than dry beds.

### Enuresis Alarms

Conditioning therapy by enuresis alarm has become deservedly popular in the last 20 years. It frequently works.

Though it is often written that the child is being trained to awaken when he wants to micturate, this is not so, for more commonly after using the buzzer the child is conditioned to putting up with the sensation of a full bladder and sleeping on until the morning when he awakes and passes urine in the pot or lavatory.

There are more than a dozen different types of apparatus available ranging from home-made ones costing £1 to others costing nearly £10. They all work on the principle of urine causing electrical contact to sound off an alarm bell. Most have two metal foil or mesh sheets (about 2 feet x 3 feet; 60 x 90 cm.), one of which is put on top of the mattress or rubber mat on the bed (see Fig.). A piece of cotton material is folded double completely covering it, and the upper perforated sheet



placed on that, followed by the usual bed sheet. They are placed so that they will be under the child's buttocks and each is connected by a wire to the battery-driven alarm unit, which is placed out of reach of the child. When the child wets the bed the alarm goes and the child has to get out of bed and pass urine. Either mother or child must wipe the metal sheets dry and remake the bed with the apparatus set up again.

Using the alarm is quite a lot of trouble for the family, but the results justify it, and in a well-run clinic over 60% of children can be cured of enuresis.<sup>4</sup> Most of these children achieve a cure after 10-15 "bells"—that is, between two and ten weeks after starting to use the alarm. Relapse can be treated with a second course of the alarm.

It is essential that the alarms are handed out with adequate instruction and demonstration. It does not matter whether this is done by nurse, social worker, or doctor as long as it is someone both interested and expert in its use who will arrange to see the parent and child at intervals while it is being used. Unless this is done the family are likely to run into small problems and stop using it. The commonest place to find an "unreturned" enuretic alarm is, laden with dust, unused on top of the wardrobe.

The availability of alarms varies from area to area. Some group practices have their own, others rely on stocks kept for loan by local authorities or hospital paediatric departments. The alarm requires co-operation from parent and child, and is unlikely to be successful below the age of 5. It is most effective over the age of 7. Common reasons for failure are faulty use of the apparatus, too much effort being required to use it each night, and the alarm disturbing other children in an overcrowded bedroom. A few children flatly refuse to sleep in beds which are "wired up." If a child sleeps through a loud alarm long-acting amphetamines (for example, Dexedrine Spansule) may be given at night to try to lower the arousal threshold.

Buttock rashes have occurred in children using alarms, in some cases associated with bad ulceration. The main reason for them is when the child wets but fails to awaken (too quiet an alarm, or a run-down battery) electrolysis occurs between the urine and metal, and the child's skin is burnt. Good maintenance of the apparatus and careful use are the best ways of avoiding the complication. Some alarms are less likely to cause buzzer rashes than others,<sup>5</sup> and ones which automatically disconnect the system once they have been triggered off are preferable. The type of metal sheet used is also important; most rashes have been reported with foil sheets rather than mesh ones or the wired plastic ones. There is a wide range of prices for the special sheet; foil sheets last only for one course of treatment, yet vary in price by a factor of 10. Mesh sheets will last for two courses. To prevent the parents feeling needlessly guilty they should be told how long the sheets usually last.

### Second Opinion

Enuresis is best managed by the family doctor. Even if this were not so it would be unrealistic to suggest anything else, for the number of enuretic children is great. There are over 400,000 children with nocturnal enuresis aged between 4 and 10 in Britain—well over 1,000 per paediatrician. It is reasonable after a period of unsuccessful therapy to enrol the help of a paediatric clinic. If there is a specific enuresis clinic run either by the local authority or hospital, that is the clinic of first choice because it would not be there unless someone was enthusiastic about the problem.

### Conclusion

The history of enuresis treatment must make one sceptical about any particular method of therapy. The scepticism should be tinged by neither cynicism nor despair; nocturnal enuresis is a challenge, not a defeat.

A lot can be done to help the thousands of children who wet their beds, and the doctor who is sympathetic to their problems and has a clear plan of campaign which he carries out enthusiastically will achieve many successful cures.

### REFERENCES

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