

The Causes of Nocturnal Enuresis

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Nocturnal enuresis is defined as bedwetting of a stated frequency (*e.g.* once a month, or once a week or more) in a child over a stated age (*e.g.* four or five years) in whom no obvious organic abnormality has been found. The word involuntary is often included in the definition, but as this characteristic is inferred and not observed we are on safer ground if we omit it. If the enuresis has been in some degree present continuously from birth it is called primary, and if it has appeared after a period of dryness it is called secondary or onset enuresis. The requisite length of the period of dryness is implied by the frequency of wetting selected for the definition of enuresis. If this was 'once a month' and the child has been dry for a month, then he does not have enuresis. It is therefore clear that if after being dry for three months he starts bedwetting again his present enuresis is 'onset' enuresis. Yet elsewhere in this book, secondary enuresis is defined as enuresis starting after a period of dryness lasting a year.

What are we doing in looking for the 'cause' of a symptom? In brief, a symptom usually has an underlying disorder and the disorder has a cause. We sometimes treat symptoms; we sometimes treat disorders; sometimes we have specific treatment of the cause. We can treat heart failure from mitral stenosis by operative correction of the stenosis; we can prevent it by preventing rheumatic fever. Sometimes we have an empirical remedy which we know to be efficient without knowing why it is so. There are many families unhappy because of enuresis. We want to cure the children who have it, and we should be wanting to prevent it.

In looking for the cause of a person's enuresis, certain points are worth considering.

- (1) Enuresis is a symptom, and it is likely that a number of different causes would be responsible in different individuals. This does not mean that we cannot hope to find a cause that has been or is responsible in a high proportion of enuretics, or at least highly contributory.
- (2) It is also likely that enuresis is multifactorial in origin in the other sense of the word, namely that several factors have been or are together responsible for the symptom.
- (3) In any one person, the cause of a continuing symptom may change. An infant may have diarrhoea which was initially infective and later was due to secondary disaccharide intolerance.

Consider an eight-year-old boy who has wet the bed frequently from birth. Up till four years of age this was accepted and explained as normal behaviour for children aged nought to four years. At four and a quarter he might have been wetting because, for example, maturation had not yet occurred, but at age eight he may be wetting

because of his own and his parents' anxieties. This would be confirmed if, after explanation to them all, the boy rapidly became dry at night. This would also demonstrate that the necessary maturation was in fact present.

(4) A modification of behaviour may persist because whatever produced it is still present and at work. But transient causes can have effects which continue after the influence that originally produced the change has ceased to operate. In a case of diarrhoea from secondary disaccharide intolerance, no amount of investigation would reveal the cause of the original transient infective enteritis. It would, however, reveal what is now causing the diarrhoea to continue, namely the lactose in the diet.

In thinking about the 'cause' of the primary enuresis of an eight-year-old boy, it will be worth looking for what is keeping this symptom going now. But what prevented him from becoming dry at age four (and so caused him to be different from the eighty or ninety per cent of his peers who did) may well be no longer operating, and cannot now be found, however carefully the present physical and psychiatric state is studied.

(5) It is possible to fall into the trap of calling bedwetting 'enuresis', and then thinking that one has identified a disease which must have underlying causative physical and psychic disorders present now, because most diseases do.

(6) Another trap is to say, accurately enough in a descriptive sense, that 'enuresis is a developmental disorder', and then, unconsciously and without good evidence, to assume that this is a statement about aetiology, *i.e.* that enuresis is *due to* disordered development.

(7) Sometimes a speaker or writer about enuresis begins by discussing day-time bladder control or wetting, and makes certain points about 'enuresis'. As he continues his discussion of 'enuresis', he makes a transition, and starts to discuss nocturnal enuresis, without pondering over whether what was true of diurnal does in fact apply to nocturnal enuresis.

(8) The fact that conditioning is an efficient method of treating established enuresis does not mean that children aged two or three years necessarily become dry by conditioning.

The Causes of Enuresis

- (a) Why does a minority of children not become dry by age four or five?
- (b) Why do some children develop 'onset' enuresis?
- (c) Why does enuresis persist?

Of necessity, this section repeats some of what was set out in Chapter 1 of this book, but there the emphasis was on the development of dryness, and here the problems are looked at more from the standpoint of enuresis. It seemed logical that this section of the book should have a brief statement of the ideas of causation set out at greater length in Chapter 1, even at the cost of some of repetition.

(a) Why Does a Minority of Children not Become Dry by Age Four or Five?

The idea that if we looked hard enough we could find organic abnormalities in these children dies hard, but most doctors would today agree that organic abnormalities are unlikely to be responsible for more than a small proportion of failures to

become dry. The idea lifts its head in other versions. Small bladder capacity is one of these. In Chapter 31, Rutter makes some critical comments on the concept, pointing out that dry children aged four have smaller bladder capacities than wet children aged seven, and in Chapter 1 attention is drawn to the two-and-a-half-year-olds who had hourly frequency during the day and yet were dry at night (Roberts and Schoellkopf 1951). The work of Hutch and Schopfner (1968) (also quoted in Chapter 1) showed that the position of the bladder base plate changes in childhood, but that the change to the mature position comes two years after the emergence of night-time bladder control.

Delayed maturation of the central nervous system connections necessary for nocturnal bladder control has been widely invoked as the common cause of enuresis. In Chapter 1 of this book and elsewhere (Mac Keith 1968, 1972), evidence has been collected that in nearly all children maturation has occurred by age five. But while variations in the age of maturation of the necessary central nervous system mechanisms cannot be used any more to explain enuresis in children over five years old, they may be a factor playing a considerable part in the failure of some children to become dry by age four or five. When maturation occurs in the first or second year of life, the conditions for emergence of the desired behaviour will usually be good. If maturation does not occur till age three or four, the child's failure to have become dry may lead to increased pressure by the parents, and this may induce a state of anxiety in the child, which, as suggested below, inhibits the emergence of night-time bladder control.

Genetic factors probably play their part by affecting the age at which maturation occurs. There are also familial factors, such as parental expectations, which are not genetic.

Faulty training, with a sub-explanation of poor conditionability, is another explanation put forward for the minority's failure to become dry at night. It depends on the assumption that night-time dryness is a learned behaviour. Were the seven per cent of children dry at night by the age of one year taught? In Chapter 28, Turner asks whether learning in sleep is possible, and remarks on the scantiness of evidence that training methods affect the issue. It is sometimes said that what happens is that the child is conditioned to day-time dryness, and that this behaviour spreads to the night-time. But in the Minnesota study of Roberts and Schoellkopf (1951), at age two and a half, 16 per cent of children were dry at night but still wetting during the day.

In Chapter 1, evidence is given that night-time control is probably a behaviour which ordinarily emerges spontaneously in the first four years of life, and does not have to be learned. The emergence follows maturation of the necessary central nervous system connections, provided that there is nothing to inhibit the emergence.

Spock (1946) noted that 'the bladder sometimes "trains" itself before anybody has a chance to train it'. Mowrer (1950) also recognised that, in the absence of specific continence training, human infants will 'sooner or later acquire sphincter control during sleep as well as at other times', since 'no healthy member of any other mammalian species once past the age of infantile helplessness soils itself during sleep'.

Lovibond and Coote (1970) clearly imply that cortical control of nocturnal bladder control may happen from maturation alone.

Failure of emergence of night-time dryness can occur if the child comes under stress when maturation is occurring and dryness is about to emerge. In Chapter 15, Douglas gives evidence of the association of certain stresses in the third year with enuresis at age four and a quarter years. There is other evidence from Miller *et al.* (1960), Young (1965) and Cust (1958). Conversely in 1962, Brazelton showed that, using a system of toilet training devised to reduce the child's anxiety in this area to a minimum, 98½ per cent of children were dry at age five. This suggests that in addition to the stresses studied by the authors referred to above, toilet training is a common source of the anxiety which prevents the emergence of dryness. 'There is considerable certainty about the dimension of severity (in toilet training) It does not serve to speed his training in the slightest, and may, if the mother is rather cold in her relations, serve to initiate a prolonged period of bedwetting.' (Sears *et al.* 1957). The minority of children who by age four do not develop consistent dryness will, when they reach the age of five, be suffering from primary enuresis.

It may be noted that sometimes the stress that inhibits the emergence of dryness persists. This occurs in disharmonious households. But in many cases the stress is a transient one and disappears. But the bedwetting continues.

Why do Some Children Develop 'Onset' Enuresis?

With little hard evidence for the belief, most paediatricians consider that onset enuresis nearly always follows emotional stress. Rutter *et al.* (this volume Chapter 17) have shown that children who develop onset enuresis have had emotional disturbance beforehand. In onset enuresis we have an example of how a behaviour, in this case nocturnal continence, is lost without organic disorder of the bladder. In addition, even when the stress is a temporary, transient one, the loss of the behaviour may continue for a long time, often for years.

Why Does Enuresis Persist?

Many children admitted to hospital for enuresis promptly become dry. Others promptly become dry after a doctor has discovered the fears of the child and his or her parents, has explained why they are unnecessary, and has pointed out that the child will certainly become dry. Other children become dry when school or other pressures are lightened. It looks as if anxiety is a major reason for persistence of enuresis. This anxiety may be apart from or secondary to the wetting, and it may be primarily in the child or in his parents. These observations are good evidence that enuresis over the age of five is not due to failure of maturation.

Occasionally there is unrecognised urinary tract infection or other organic abnormality. This can be a contributory cause to the persistence of bedwetting.

Conclusions

Night-time bladder control emerges spontaneously, without being learned. It appears when maturation occurs. In a minority, the emergence of dryness when maturation has occurred is inhibited by anxiety. The anxiety may be a persisting one, as in a disturbed family, or a transient one, such as the arrival of a younger sib.

By age five, maturation of the necessary central nervous system connections has occurred in practically all children.

The children who at age five are enuretic include nearly a third who have been dry at night for three or more months, and ought therefore to be recognised as having 'onset' and not primary enuresis.

In many children enuresis persists because of anxiety and defeatism, but there may be other reasons to be elucidated.

With a low anxiety system of toilet training, nocturnal enuresis can probably be prevented in 98½ per cent of children.

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