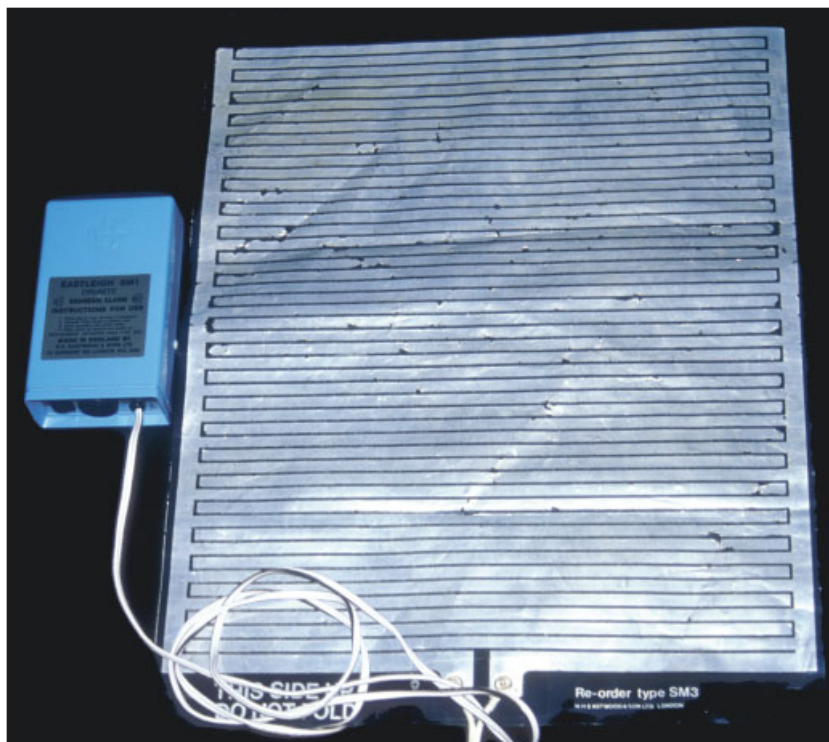


Recommended management of nocturnal enuresis in children

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Our series Prescribing in children gives practical advice for successful management of childhood problems in general practice. Here, the author describes the three systems approach used in the treatment of nocturnal enuresis.

Figure 1. Bed-wetting alarms are available from enuresis clinics and can also be bought over the Internet; they may help accelerate the time to natural dryness

Night-time wetting is common, and can have a devastating effect on the well-being of affected children and their families. The age at presentation varies from under five years to adulthood. The fact that a parent is presenting with their child clearly implies that, however long they may have lived with it, they now want to explore treatment options.

Basic investigations such as urinalysis and blood pressure should be carried out at least once, but there is very rarely, if ever, a serious underlying medical cause. Indeed, most children who bed wet do not have any underlying psychological problems – other than those caused by wetting.

Prevalence and treatment considerations

Night-time dryness is a developmental skill that children acquire at different ages. The generally accepted figures suggest that up to 20 per cent of five year olds wet the bed at night, and this reduces steadily so that, by adulthood, the number has fallen to around 1 per cent. However, these figures relate to children who wet the bed at least once per month. The number that wet daily is likely to be nearer to 1 per cent in all age groups.

Children who bed wet daily may respond less well to treatment, while for children who wet occasionally continuous treatment may seem excessive. This raises signifi-

cant questions about treatment options. For instance, at what age should any treatment be offered, and what are the risk/benefit analyses of intervention for prescribing drugs for a ‘nonserious’ condition that will improve over time.

Of greater importance is the realisation that, as this is a largely developmental problem, behavioural therapies are often found wanting. If there is a behavioural component, this can be explored using methods such as a star chart, *ie* rewarding a child through incentive schemes. Their use should be considered as ‘testing a theory’, and if not successful should not be continued for more than a week.

Their continued use and the offer of unattainable rewards may be tantamount to taunting – it goes without saying that punishment for wetting is entirely inappropriate, though all too often practised. A useful analogy would be the request that you wake up in exactly the same position as you go to sleep in: as events during sleep are beyond your control, rewarding or punishing you the next morning is likely to be futile.

General measures

There is much debate about what general measures should be recommended. Certainly there is no dispute about avoiding caffeinated drinks. Some people advocate avoidance of blackcurrant juice. Increasing daytime drinking is also generally agreed upon, with more diverse opinions about when to stop drinking at night.

Reducing night-time drinking seems sound. I recommend trying to stop drinks for an hour or two before bedtime. It is also essential to go to bed with an empty bladder – urinating once or twice before bedtime. The child should be encouraged to urinate if they wake.

Constipation is a common problem that makes all urinary problems harder to deal with and is often overlooked. For many children who do not wet every night, their wet nights are linked to when they have not opened their bowels. It is therefore essential to check for underlying constipation and treat it as necessary – enuresis is almost impossible to treat otherwise.

Despite their claims or suggestions, most drug treatments do not accelerate the time to natural dryness. This can lead to their under-use: ‘they don’t really treat the problem’. I usually counter this by saying that if you are destined to be dry in three years’ time, and you could spend the next thousand

nights wet or dry, which would you choose?

On the other hand, professionals often decry ‘lifting’ – waking the child to urinate in the night – as ineffective because it does not train a child to be dry. However, if it keeps them dry till they are developmentally ready, then it can be a useful nonpharmacological remedy.

It is necessary to point out that although drugs provide a ‘fixed amount’ of help, the child themselves will be growing ‘stronger’ every night. This can offer some encouragement to children, by explaining that at the moment the gap between what they need to be dry and what the medicines can offer is a bit too large, but in a few

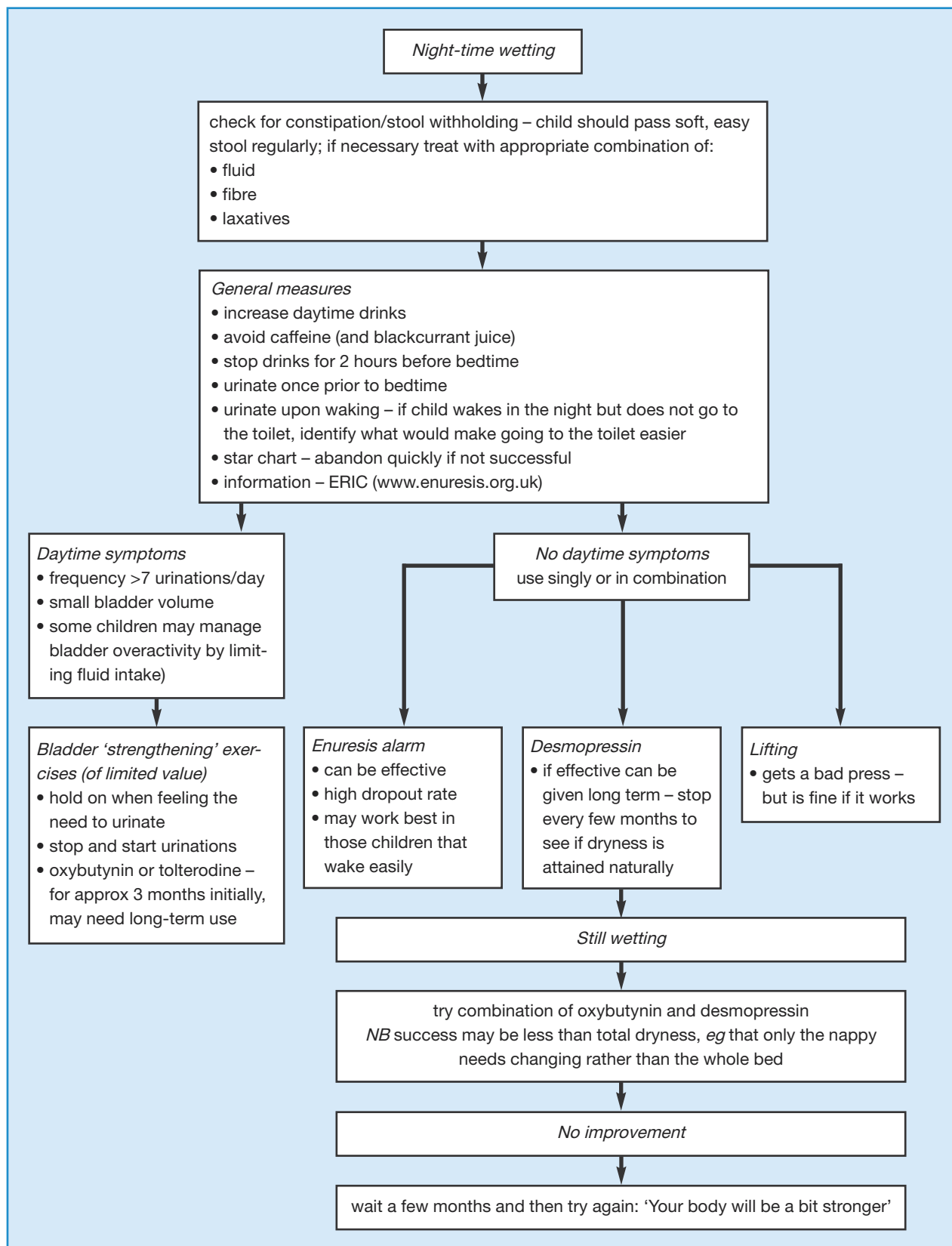


Figure 2. Recommended management of nocturnal enuresis

	Primary – no significant period of dryness	Secondary – wetting after a significant (6 months) period of dryness
<i>Monosymptomatic/ no daytime symptoms</i>	general measures alarm desmopressin (reduced chance of success)	identify precipitants general measures alarm desmopressin
<i>Polysymptomatic with daytime or other symptoms</i>	general measures treat constipation antimuscarinics (oxybutynin/tolterodine) if not effective, consider use of alarm or desmopressin	identify precipitants general measures. treat constipation antimuscarinics (oxybutynin/tolterodine) if not effective, consider use of alarm or desmopressin

Table 1. Nomenclature and treatments for nocturnal enuresis

months’ time, if the medicines are tried again, they may be able to bridge the gap – which has become a little narrower (see Tables 1 and 2).

If complete dryness is not achieved then you should consider what are appropriate treatment goals. For example, treatment may mean that instead of wetting through a ‘pull up’ and soaking the sheets and mattresses, the urine is contained within the pull up. For many people this would be considered a sufficient gain to wish to continue with treatment.

The three systems approach

The three systems approach has gained widespread acceptance in the understanding of enuresis. It identifies the following factors as essential in attaining night-time dryness:

- overnight urine production that is not excessive
- a bladder that can hold a significant volume of urine
- the ability to wake up if the bladder is about to empty.

We will look at all of these briefly in turn.

Overnight urine production

Most individuals decrease urine production overnight, partly because they have a reduced intake of fluid and partly because there is an increase in secretion of vasopressin (antidiuretic hormone, ADH). Many children who wet the bed do not have this night-time increase in ADH secretion and so produce vast quantities of urine overnight. They will tend to soak the bed and may wet later on in the night as the bladder overfills. Classically they will only wet once or maybe twice at night.

In pure ADH secretion problems one would expect there to be no day-time symptoms. Clearly, the mainstay of treatment would be ADH replacement. The most popular formulation at present is DesmoMelt (desmopressin) – available in 120µg and 240µg strengths. The usual dose is up to 240µg at night – although in some countries they are licensed at a higher dose, and anecdotally some children find added benefit from using 360µg. ADH is metabolised within a few hours so effects should be seen immediately. If it does not

work there is little point continuing treatment.

As ADH is now licensed for long-term use it can be continued for a few months, at which time it is worth taking a break to see if natural dryness has been attained. If wetting persists then the medication can be restarted for another three months and so on, until it is no longer necessary. Some people prefer to reserve it for ‘special occasions’.

ADH has an excellent safety profile. The main concern is hyponatraemia due to excess fluid intake following medication. As medication should be seen as an add-on to general measures, which include stopping evening drinking, this should not be a problem. It is clearly more of an issue in those children where controlling night-time drinking may be difficult, eg those with behavioural problems.

In children who wet despite desmopressin, there seems to be an advantage in using oxybutynin as well.

Overactive bladder

Many children have overactive bladder syndrome (detrusor instability or twitchy bladder). This is often manifested by daytime symptoms of urgency and frequency. Usually they will urinate in small volumes at least seven times a day. The urgency is a little more difficult to define as many children who hold their need to urinate for hours (bladder bursters) will show urgency but will go infrequently and pass large quantities of urine.

Normal bladder volume is usually given as: (age +1) x 30ml or (age +1) x fl oz, until age 12 when adult bladder volume is obtained. The best way to measure urine volume is to ask children to do this at home, urinating into a measuring jug when bursting – ‘your world record wee’.

Detrusor activity can vary at different times and is governed by a number of factors including stress, so

<i>Enuresis alarms</i>	usually available from enuresis clinics can be bought via the Internet very helpful if they work and may accelerate the time to natural dryness require perseverance – many months
<i>Desmopressin</i>	antidiuretic hormone effective in up to 70% of children works for the night and is worn off by the morning – if ineffective, there is little point persevering with it now licensed for long-term use, so if effective it can be continued for a few months then stopped to see if natural dryness has been attained main risk is hyponatraemia if the child drinks large volumes after taking desmopressin
<i>Antimuscarinics, ie oxybutynin/tolterodine</i>	'bladder' stabilisers may take many weeks to attain maximum effect bladder overactivity may be transient, so could try stopping after 3 or 4 months generally very well tolerated

Table 2. Common treatments for enuresis

when a child is worried they are more likely to have urgency and frequency, which can persist into the night.

Children with overactive bladder syndrome can be asked to do bladder-training exercises, which are similar to pelvic floor exercises in adults. This requires them to hold on to their need to urinate and to stop and start the flow of urine. In reality it is rare that this is effective – most children will not remember to do these exercises.

More often, medication will be required. The antimuscarinic drugs are the most commonly prescribed. There is greater experience with oxybutynin (not licensed for children under five), although tolterodine (not licensed for children) may also be used.

Oxybutynin seems to be very well tolerated, with very few children experiencing side-effects. There is a dosage range based on age, which is detailed in the *BNF for Children*. It is best to start at a low dose and increase as necessary. It can take a few weeks to see the full

effects of a dose, so a dosage change should be given time to work.

For many children there is a significant amount of 'reversibility' in relation to an overactive bladder, and the oxybutynin seems to 'train' the bladder so that on stopping it the symptoms do not recur.

Some children seem to have more persistent symptoms. As it is difficult to know which category a particular child will fall into, it is again useful to wean the oxybutynin every few months – to make sure that its continued use is really necessary. There is some debate over whether it is best to wean it gently or stop it suddenly, with no clear consensus. In practice, how and when to stop oxybutynin is best negotiated with the child and family.

Some children with bladder overactivity may be dry at the cost of having to go to the toilet many times during the night, which could cause daytime sleepiness with all its consequent effects. Treatment may be required to allow the child to sleep at night while remaining dry.

Wakeability

The ability to wake up when necessary again improves with age. It is important to distinguish waking to external or internal stimuli. Up to a third of children who wet the bed will wake before wetting, but then go back to sleep again. These children may not wake to loud noise. The child can be asked directly if they wake during the night; if so, the reason why they do not go to the toilet should be identified and incentives can be found to help overcome this.

It is possible that the enuresis alarms (see Figure 1) are most successful with those children who have some degree of wakeability.

What shall we tell the children?

The most important messages to tell any child with bedwetting are:

- it is not your fault
- you are not alone
- it will get better as you get older.

The Education and Research into Childhood Continence (ERIC; www.enuresis.org.uk) is a fantastic resource for families. They have dedicated children's areas, which can help children feel less isolated.

Further reading

Constipation, withholding and your child: a family guide to soiling and wetting. Cohn A. Jessica Kingsley Publishers, 2006.

Differences in characteristics of nocturnal enuresis between children and adolescents: a critical appraisal from a large epidemiological study. Yeung Chung K, *et al. BJU International* 2006;97(5): 1069-73.

Management of disorders of bladder and bowel control. Gontard A, *et al.* Mac Keith Press, 2006:86-131.

The three systems: a conceptual way of understanding nocturnal enuresis. Butler RJ, *et al. Scand J Urol Nephrol* 2000;34(4):270-7.

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