

# CHILDHOOD NOCTURNAL ENURESIS: ASSESSMENT AND MANAGEMENT IN PRIMARY CARE

Nocturnal enuresis is a distressing and widespread problem, and upsetting for children and for their families. Despite a wealth of guidance about how to diagnose and manage the condition, it is still not widely understood by healthcare professionals. Here consultant paediatrician Dr Anne Wright discusses the challenges faced in primary care.

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### CASE STUDY

Ten-year-old Ben presents with his mother complaining of nightly bedwetting since toilet training. They have tried fluid restriction before bed, and mother tries to wake him during the night, but he is a deep sleeper.

When younger, Ben used to have minor accidents in his pants during the day, but not any more. There is friction between Ben and his older brother because of the smell in their room, and Ben is anxious about bullying on an upcoming school camp.

The GP attempts to contextualise Ben's wetting for him and his mother. Further questioning reveals that Ben is often wet by 11.30pm (parents' bedtime) and again by morning. By day, he needs to use the school toilet once or twice. He never has any difficulty initiating his stream or continuing it but can't hold on once he needs to go. He opens his bowels every two days (Bristol type 3/4). Ben's teacher says he chats a lot but his learning is average.

There have been various attempts to define nocturnal enuresis. The current guideline from NICE (<http://guidance.nice.org.uk/CG111>) puts it simply as "the symptom of involuntary wetting during sleep without any inherent suggestion of frequency or pathophysiology".<sup>2</sup>

The DSM V criteria are somewhat more precise: repeated voiding into bed at least twice a week for three consecutive months a year, or causing significant distress in a child aged five years or older.<sup>3</sup>

Although the causes of bedwetting are not fully understood, it is thought to be a symptom arising from a combination of predisposing factors. These are

*research shows that only children with mild/moderate enuresis spontaneously improve*

### Discussion

According to data from the Avon Longitudinal Study of Parents and Children (ALSPAC) survey (2005), bedwetting is significantly more prevalent among boys than girls at 7.5 years of age, as shown below:<sup>1</sup>

SEVERITY	PREVALENCE (at 7.5yrs)	
	Boys	Girls
Mild (once a week)	16.6%	8.9%
Moderate (twice a week)	3.3%	1.5%
Severe (once a night)	0.3%	0.2%

categorised as sleep arousal difficulties, production of large volumes of urine and bladder dysfunction.<sup>4</sup>

The impact for children can be devastating. Younger children in particular do not like the immediate consequences of wetting – including the need to wear nappies and having to bathe every morning – while older children dislike feeling like a baby, the fear of being revealed and hiding the secret from others typically experiencing guilt, anger, frustration and low self-esteem.

The natural reduction in prevalence with age has previously led to the conclusion that children will "grow out of it", and the condition has often been trivialised. However, research shows that only children



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- Tailor intervention to the needs and circumstances of the child and family
- Do not exclude younger children from assessment and treatment
- Discuss what support is needed, especially if anger or negativity is expressed by parents or carers.
- Consider what is the most appropriate treatment for the child and family
- Ensure that the child is drinking sufficient fluids and has a toileting routine in place
- Suggest reward systems are for agreed actions such as engaging in management rather than for dry nights
- Offer an alarm as first-line treatment unless unacceptable to the child and family or bedwetting is infrequent
- Offer desmopressin to children over five years if short term improvement is a priority or the alarm is inappropriate
- Refer children who have not responded to treatment with an alarm and/or desmopressin for further review and assessment

### Assessment

Comprehensive history taking is essential in order to assess bedwetting patterns (severity, timing, amount, waking), daytime symptoms, toileting, fluid patterns, and comorbidities (e.g. urinary tract infection, constipation, diabetes mellitus, behavioural/emotional triggers, family/social issues, maltreatment).

Other factors to take into account include learning difficulties, physical disability, attention deficit hyperactivity disorder (ADHD), conduct disorder and autistic spectrum disorder

Assessment should be tailored to the individual and may involve for example abdominal examination if constipation is a feature, urine dipstick if there are features of urinary tract infection or diabetes and appearance of the lumbar-sacral spine if daytime wetting is present.

The 2010 NICE guideline recommends a number of initial management strategies including the need to

with mild/moderate enuresis spontaneously improve, while children who wet every night and are 10 years and older show statistically little improvement with time.<sup>5,6</sup> In addition, this distressing condition can have far reaching effects on emotional wellbeing and social development. Children and young people often miss out on opportunities such as sleepovers and school trips and start to feel “different” when they are not dry by the age of five.<sup>4</sup>

The impact on the family is equally distressing – parental lack of sleep, increased laundry, the increased financial burden (nappies, heating/washing, replacement of linen/mattresses/beds) and odour issues.

There is also the potentially serious issue of verbal and physical aggression arising from nocturnal enuresis – frustration with the child from parent and siblings, and the feeling of failure as a parent.

### Care priorities

The 2010 NICE guideline has summarised the key priorities for health professionals dealing with nocturnal enuresis as follows:<sup>2</sup>

- Inform the child and families that bedwetting is not the child's fault and punitive measures should not be used

inform and educate both children and their parents (stressing that nocturnal enuresis is not the child's fault and that punitive measures are unhelpful), as well as regular toileting and reward charts.<sup>2</sup>

NICE states that fluid intake should be normalised during the day. Its guideline recommends the following:<sup>2</sup>

Total drinks per day:

- age 4-8 years, 1000-1400mls (6-8 x 150mls), both boys and girls
- age 9-13 years, 1200-2100mls for girls, 1400-2300mls for boys (6-8 x 200mls)
- age 14-18 years, 1200-2500mls for girls, 2100-3500mls for boys (6-8 x 250mls)

It is sensible to restrict fluid intake for one hour before bed and always urinate before bed.

*Reduced nocturnal bladder capacity may mean an overactive bladder that will present with daytime symptoms*

## Treatment

Sleep arousal disturbance underlies all nocturnal enuresis and treatment for this is the enuresis alarm. NICE recommends that alarms should be offered to children and young people whose bedwetting has not responded to advice on fluids, toileting or an appropriate reward system, unless the alarm is inappropriate or undesirable.

The use of an alarm however can be frustrating. Importantly, the alarm is only triggered when urine comes into contact with the sensor, so in a sense, this is like closing the stable door after the horse has bolted. And once it has sounded the child is required to get out of bed and go to the toilet having already urinated. The alarm is an operant conditioner that teaches the child to wake and toilet rather than magically making them dry and this is usually achieved after two to three weeks of compliance. Not surprisingly there can be a significant drop out rate.

An alarm may be inappropriate when bedwetting is very infrequent (that is, less than 1-2 wet beds per week); if the parents or carers are having emotional difficulty coping with the burden of bedwetting; if the parents or carers are expressing anger, negativity or blame towards the child or young person; or if the child is not motivated.

When considering an alarm, therefore, healthcare professionals should:

- Ensure that advice and support are available.
- Inform children and young people and their parents or carers about:
  - the benefits of combining alarm treatment with a reward system
  - the high long-term success rate of alarm treatment
  - the aims of alarm treatment
  - practical issues for using the alarm (such as impact on sleep, commitment needed)
  - the early and late signs of response.

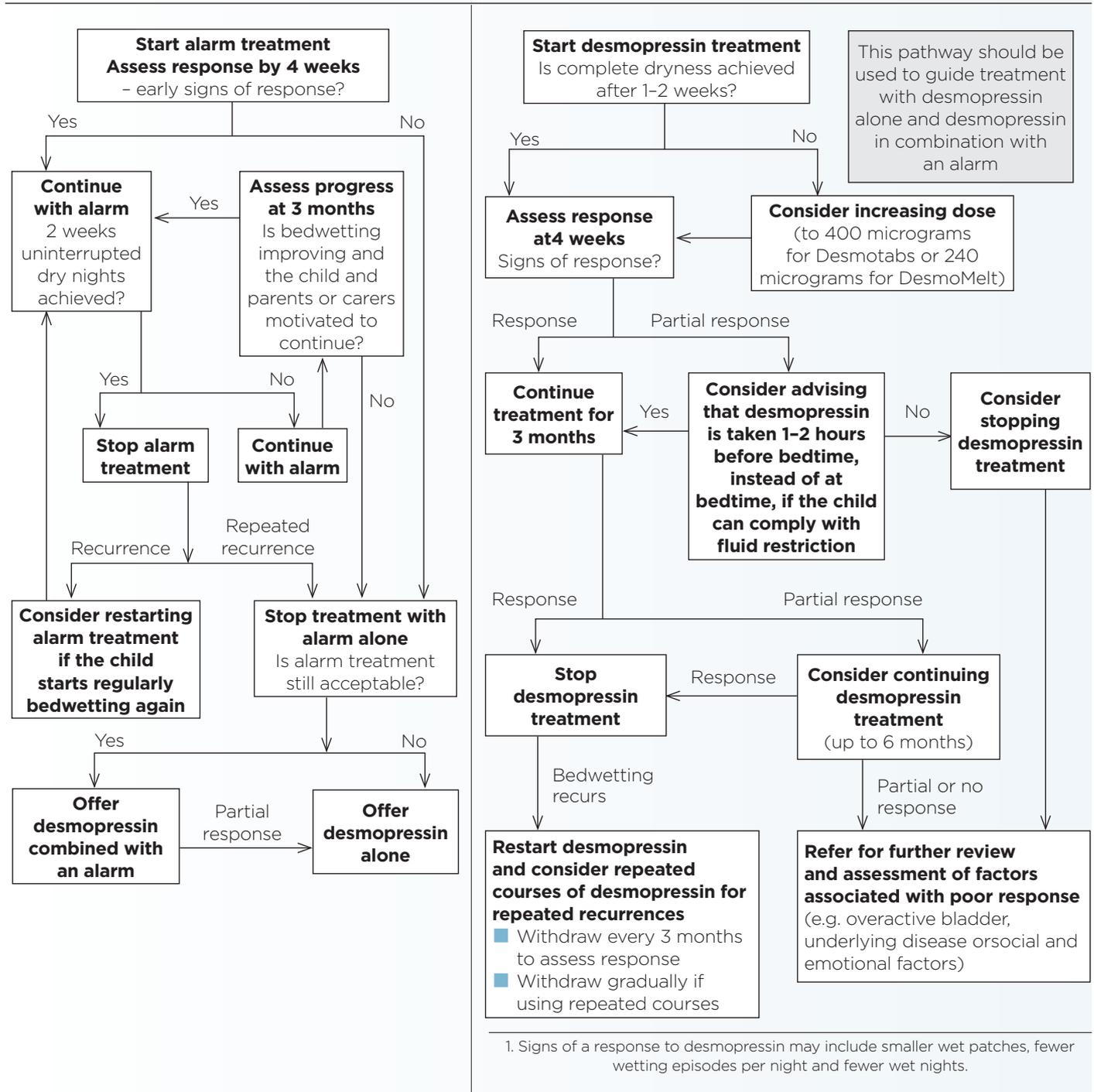
Pharmaceutical intervention with desmopressin – an analogue of the anti-diuretic hormone, vasopressin – is often key to the successful management of nocturnal enuresis. Desmopressin acts by concentrating urine via the V2 receptors in the collecting tubules of the kidney but has no direct effect on the bladder or any direct cardiovascular action.

- NICE recommends that desmopressin should be offered to children and young people over seven years, if rapid-onset and/or short-term improvement in bedwetting is the priority of treatment, or in situations where an alarm is inappropriate or undesirable. Desmopressin treatment in children 5-7 years may be considered if treatment is required.<sup>2</sup>
- Desmopressin is now available in two formulations:
  - Desmomelt: 1 x 120mcg at bedtime, increasing to 2 if no response after 1-2 weeks
  - Desmotabs: 1 x 0.2mg tablet at bedtime, increasing to 2 if no response after 1-2 weeks

Duration of action is dose-dependent with optimal dose giving 6-8 hours duration. Desmopressin should be used for as long as symptoms persist, but re-assessed every three months with one week off treatment. It has been reported that desmopressin does not suppress endogenous vasopressin after treatment for six months.<sup>7</sup>

On a practical note, fluid restriction must be observed for one hour prior to medication with desmopressin and eight hours thereafter to prevent the risk of hyponatraemia. Indeed, the licence for the nasal spray formulation of desmopressin (Desmospray) was removed because of reported clinically significant hyponatraemia (headache, vomiting, altered consciousness, seizures) associated with prolonged half life of the spray preparation<sup>8</sup> and not seen with the oral preparations of desmopressin.<sup>9</sup> The efficacy of treatment with desmopressin can be improved as follows:<sup>10</sup>

- Dosage: if no response on 200mcg tab/120mcg melt after 1-2 weeks, double the dose
- Timing of medication: giving medication one hour before bedtime increases antidiuretic effect

**FIGURE 1. ALGORITHM FOR TREATMENT OF NOCTURNAL ENURESIS (NICE 2010)**

- Timing of meals: a meal shortly before bed reduces the efficacy of tablet desmopressin in contrast to the melt with a difference of up to 72ml of urine

A complication of reduced nocturnal bladder capacity in many children may mean an overactive bladder (OAB), involving daytime lower urinary tract symptoms (LUTS) in addition to nocturnal enuresis. Urgency is the hallmark symptom of an overactive bladder with others including:

- Urge incontinence
- Frequency
- Posturing
- Wetting before the child can get to the toilet
- Forceful stream with small amounts of urine

The management of OAB involves bladder retraining with regular fluid intake, timed regular voiding, correct toileting position with supported feet and

**CASE STUDY - CONTINUED**

Ben starts to use an enuresis alarm, and after a week starts to be able to wake spontaneously on some nights. By two weeks the patches in the bed are getting smaller and by week three he is managing to get out of bed before mum gets there.

Ben and his mother come back to see you six months later. Ben has relapsed and is wetting 3 nights/week. His brother refuses to let him use the alarm again. Ben is due to go on a school camp in six weeks.

Ben increases his fluid intake by day as advised and starts to have difficulties in school as he now toilets 12 times/day and often has small leaks while rushing to the loo. Mother has recorded some voided volumes and the largest volume he produced was 200ml. His urine is clear on dipstick. He has had only partial response to the desmopressin.

pelvic floor relaxation and the use of charts for prompting and recording. Drug therapy invariably includes anticholinergics combined with desmopressin before bed (e.g. oxybutynin 2.5-5mg and tolterodine 1-2mg. Anticholinergics should not be used alone for bedwetting). Both drugs should be titrated slowly, and constipation should be addressed first.

*The current NICE guidance recommends desmopressin combined with an anticholinergic as an effective option for enuresis together with LUTS by day*

The current NICE guidance recommends desmopressin combined with an anticholinergic as an effective option for enuresis together with LUTS by day, also known as non-monosymptomatic nocturnal enuresis (NMNE).<sup>2</sup> This strategy should only be initiated by a healthcare professional with expertise, and prescribed for three months in the first instance. If there is a partial response, treatment can be continued, as improvement can occur for up to six months. Repeated courses can be used. In NMNE, this combination approach is more effective than desmopressin alone.

Imipramine is licensed for use in nocturnal enuresis but is not recommended first-line due to its side effect profile. Imipramine is potentially useful in resistant cases that have failed first line treatments and in children who have ADHD. Minor side-effects

are common – particularly nausea, constipation and weight gain. It can be potentially fatally cardiotoxic in overdose, therefore treatment must be reviewed every three months and only withdrawn gradually.

Finally, there is the issue of refractory enuresis, with other contributors such as occult constipation, psychosocial features, obstructive sleep apnoea and snoring, sickle cell disease and ADHD that requires an individual approach.

**Conclusion**

In summary, severe nocturnal enuresis (bedwetting most nights) is **not**:

- Normal in children over 5 years
- Self-healing
- Caused by excessive drinking
- A primary psychological condition
- Untreatable
- Likely to spontaneously resolve

It is a condition that deserves greater awareness among healthcare professionals at all levels as successful intervention can make a world of difference to the many thousands of children and their families that suffer the consequences of persistent bedwetting.

**RESOURCES**

ERIC (Education and Resources for improving childhood continence) 24 hour helpline / Online shop

Information: 08453708008

Local enuresis clinics/community Child Health services

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