

Nocturnal Enuresis Resource Kit

2nd Edition - A tool for healthcare professionals

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Note from the Editors

It is our pleasure to present the updated “[Nocturnal Enuresis Resource Kit](#)”.

We would like to thank Ferring Pharmaceuticals for their ongoing support of this project as well as the authors of the first version for their vision and its success. The first version was well received and gained widespread acceptance among Australian clinicians.

What is new?

Our aim is to bring the Nocturnal Enuresis Resource Kit abreast with current knowledge and clinical practice related to the management of nocturnal enuresis. This has become necessary since the body of research has increased significantly and much of this is directly applicable to clinical practice. While incorporating the latest research, we have attempted to maintain a strong clinical focus and tailor the presented material to a targeted audience for every section. The Resource Kit is now presented in three sections: for families/carers, for primary care practitioners and for specialists. An additional section provides printable information and record sheets.

How should the Nocturnal Enuresis Resource Kit be used?

The section for parents and carers is to assist with education and helping them – and the child with enuresis – become effective partners in the child’s management. The section on primary care is aimed at general practitioners, allied health personnel and continence nurses who often provide the first level of care. The specialist section is aimed at clinicians practising in tertiary or multidisciplinary clinics who see children with refractory enuresis with or without significant comorbidities. In this section we have tips for initiating treatment in children with behavioural problems, urological disease and other disorders, as well as advanced therapy. We have also included a tool to screen for those with hitherto unknown psychological factors that impact treatment.

We hope that those caring for children with enuresis will find this resource kit useful and it will help improve the care of children with enuresis.

A/Prof P Caldwell and Dr A Deshpande

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SECTION ONE



For Parents and Carers

Bedwetting

Basic Facts for Parents and Carers

Bedwetting is known in medical terms as **nocturnal enuresis** (roughly meaning 'urinate in the night'), and sometimes is just referred to as *enuresis*.

How common is bedwetting?

Bedwetting is common in school age children. It affects:

- 1 in 5 children at 5 years.
- 1 in 10 children at 10 years.
- 1 in 30 to 100 teenagers at 15 to 17 years.

Effects of bedwetting on a child and family

It can be tempting to assume bedwetting is something a child will grow out of in time, or to minimise the problem to try to make the child feel better about it. This does little, however, to lessen its impact on a child's emotional, psychological and social development. There may be strong feelings of shame, guilt and failure, and a sense of being different to others. In some cases bullying and victimisation can result, both in the family and at school. Often bedwetters will avoid social activities that most children take for granted.

Bedwetting doesn't only affect the child concerned; it can be a burden and a source of disturbance, concern and frustration for the entire family. In addition to the emotional costs, there are the financial costs to parents/carers as well as time and effort in cleaning. It can lead to even the best intentioned parents becoming frustrated and intolerant, and relationships suffer.

Are there different types of bedwetting?

For many children, bedwetting is the only problem with wetting they have. This is called

mono-symptomatic enuresis
(meaning 'one symptom' bedwetting).

Some children have other symptoms, such as needing to wee as soon as they feel the urge (urgency), wetting while they're awake, needing to wee more often than usual, or others.

If any other bladder symptoms are present, this is called

non-mono-symptomatic enuresis
(meaning 'not one symptom', that is, more symptoms).

Your doctor will be careful to distinguish between these two, as treatment differs for the two conditions.

What causes bedwetting?

There are three main factors that cause bedwetting. These are:

- Difficulty arousing from sleep.
- Producing more urine during sleep than usual.

- Bladder factors, for instance:
 - A lack of the signal that stops bladder emptying during sleep,
 - A reduced amount the bladder can hold, or
 - Bladder overactivity, that is, the muscle that squeezes the bladder to empty it contracts when the bladder isn't full.

However, not all children have all three factors, and the contribution of each varies from one child to another.

Other factors include:

- Family history: bedwetting has long been recognised to cluster in families.
- Some children have snoring and sleep apnoea when they sleep which affects their ability to wake at night to pass urine.
- Children with developmental and other disabilities such as attention deficit/hyperactivity disorder and autistic spectrum disorder have higher rates of bedwetting.

Link with bowel problems

Constipation is common in children with bedwetting (about 25%), and can be a major factor causing the problem. Constipation and other bowel symptoms will need to be addressed by your doctor, and when these are effectively dealt with it is sometimes enough to resolve the bedwetting without further treatment.

How is bedwetting treated?

To begin, it is important to **establish regular drinking and urinating habits**. Drinking well and weeing regularly during the day is important. If the amount the bladder can hold and the urge to wee are causing problems for your child, they need to be treated before other treatment starts.

Treatment is also given for **constipation** or other bowel problems if present.

If the child has **other wetting symptoms** (if they have non-monosymptomatic type), those will be treated first, including any tests that might be needed such as a bladder ultrasound.

If bedwetting is still occurring, **alarm treatment** will generally be offered next (see the information on alarms). Alarm treatment takes longer than medication to get a result (3 to 6 months), but has a lower relapse rate than medication and no side effects on the child's body.

If bedwetting persists after 3 to 6 months of alarm treatment, medication may be considered.

Outlook for becoming dry

- About 1 in 7 children with bedwetting will stop wetting without any treatment or intervention each year.
- Without treatment some children will continue to experience bedwetting through to teenage years, and even to adulthood.
- Treatment helps the majority of children to significantly improve, and most to become dry at night much earlier.

Assessment for Bedwetting

Parent/Carer Information

What will the assessment of the child involve?

The aim of this assessment is to identify what is causing the child's bedwetting problem.

The parent/carers and the child will be interviewed by a health professional and asked lots of questions about the child's bladder, bowel function and bedwetting problem.

Many parents/carers won't know things about their child's bladder or bowel habits, as it isn't a general topic of conversations in most families. Sometimes there may be disagreement between the parent/carers and the child's answers, but remember that the child knows his/her body better than anyone. Some children won't have mentioned daytime problems; they don't see them as abnormal because it is normal for them.

The child's bedwetting problem may be caused by having a bladder that becomes overactive at night or the child may produce too much urine at night. Some children may have both problems. Most children who bed wet are unable to arouse to the sensation of a full bladder, regardless of the cause of the full bladder.

Every child and family deserves a thorough assessment of bedwetting, and this should be done in a sensitive manner. It is important to tell the health professional everything, including how the parent/carers and the child are coping with the wetting. The health professional will understand these issues.

General questions that will be asked are:

- At what age did the child develop daytime control of urine and faeces (wee and poo)?
- When did the child wean from nappies during the day?
- Has bedwetting been a lifelong problem for the child?
- Medical and surgical history (including medications as these can impact on wetting).
- What does the child eat and drink?

Health questions to check for causes of bedwetting and issues that may affect treatment, for example:

- Risk factors for bedwetting, such as sleep apnoea or constipation.
- Daytime bladder symptoms, such as urgency or frequency.
- Questions to determine whether the child's development has been normal.

Family questions are important to check for causes and the best treatments:

- What effect is bedwetting having on the child and family? (This may determine the treatments suitable for the child).
- How motivated is the child and other family members to treat this problem?
- Are there other family members who had/have wetting or kidney problems?

Physical assessment and other tests:

The health professional will need to exclude physical causes for the bedwetting.

They'll need to examine the child including the genital area, back and abdomen. They'll also test the child's urine with a dipstick to exclude infection and/or other diseases. If there's any reason why the child can't be examined please tell the health professional straight away.

What do the parent/carer and child need to do?

- Ask other family members if anyone had/has urinary or kidney problems.
- Observe the child for about two weeks before the appointment. Note if there is:
 - Urinary urgency or frequent visits to the toilet.
 - Ask the child to listen to their urine stream. Is it a steady stream or does it stop and start?
 - Record dry nights and wet nights. Also, keep a note if the child got up to go to the toilet at night.
 - Chart the child's bowel motions (poos), as constipation is a risk factor for bedwetting.
- Your health professional may also ask you to keep a 3-day frequency volume chart recording all drinks going into the body and all urine coming out of the body. This will include the amount the child is wetting and the number of times he/she gets up to go to the toilet at night. An appropriate chart and instructions will be given by the health professional treating the child.

What rights does a parent/carer or child have during an assessment?

It is the parent's/carer's right to enquire why the health professional needs to ask the questions and to ask about tests that the child may need, such as why the child need the tests, what is involved, what needs to be done for the tests, who will do them and what will the results mean for the child. The parent/carer has the right to refuse a physical examination for the child.

Bladder Management

Parent/Carer Information

What is normal?

Children should go to the toilet to pass urine between 5 - 7 times per day.

For the bladder to work properly, it needs to be relaxed while filling up with urine. Usually, the bladder only contracts (squeezes) when urine is passed. 30% of bedwetting children have overactive bladders at night, so their bladder is contracting even when they don't want it to. This might only happen at night, but for some children it happens in the daytime as well.

Aims of bladder management

- To reduce the episodes of urgency, caused by bladder overactivity or by holding on for too long.
- To normalise the bladder's holding capacity.

Symptoms of an overactive bladder

- Passing urine often during the day (frequency).
- A feeling of "busting" to go to the toilet (urgency).
- "Holding on" behaviour, like squatting or putting their hands on the genital area.
- Occasional daytime wetting.
- A lower than normal amount of urine they can hold in the bladder, for their age.
- Possibly more than one wet episode per night.

A child may experience symptoms of an overactive bladder because they are not drinking enough or because they are constipated. These should be addressed first. If they continue to experience symptoms of an overactive bladder despite drinking well and not being constipated, they need to be assessed by their doctor to see if they need additional treatment.

Important DOs and DON'Ts in bladder management

The child usually has to increase their fluid intake, most of which should be water.

- **Don't** leave all the drinking until after school.
- **Don't** drink large amounts 2 hours before bed.
- **Don't** have caffeine (found in cola, chocolate and fizzy drinks), as it can irritate the bladder and make the child feel busting and want to go to the toilet more often.
- **Do** wee regularly during the day, at least every two to three hours.
- **Do** encourage regular drinks, and reward what the child does.

What is timed voiding?

Timed voiding (weeing) can be used to change a child's bladder habits.

Some children don't go to the toilet often enough and need a schedule to prevent them overstretching their bladder. If your child needs this, your doctor or other health professional will help you work out a schedule for your child to follow.

Bowel Problems and Bedwetting

Constipation is common in children with bedwetting and can be a major factor causing the problem. Even if a child regularly passes bowel motions it is still possible that the bowel is filled with hard, impacted faeces, and this can interfere with the normal functions of the bladder.

What causes constipation?

The most common cause of constipation is regularly holding on when a child needs to pass a bowel motion. This might be because they don't like going to the toilet at school, may be embarrassed to go at a friend's house, lack of opportunity, or not wanting to stop what they're doing. Diet may play a part, with processed, low fibre diets more likely to contribute to constipation than fresh, high fibre diets. Stressful events can play a part, such as family upheaval, a new school or kindergarten, or illness. It might start after they've passed a hard or painful bowel movement, or if they have irritation around the anus. Inadequate fluid intake can lead to hard bowel motions, so it is very important for children to drink water regularly through the day.

What happens to the rectum?

When the bowel motions are held for too long, the rectum reabsorbs the water from them and they become harder and more difficult to pass, which can make a child more reluctant to pass a bowel motion the next time. The hard faeces build up and the rectum is stretched, with a loss of sensation so the child finds it harder to know when they need to pass a motion. Sometimes a child can pass regular bowel motions but hard faeces are still in the rectum and the rectum is still stretched.

What does constipation have to do with bedwetting?

When a child is constipated with a stretched rectum, it can press on the bladder and interfere with the amount of urine it can hold. It can also irritate the bladder, causing it to spasm or empty when it shouldn't. In some cases, when the constipation is treated and normal bowel function is re-established, bedwetting and other symptoms may resolve without the need for other treatment.

Bowel Management for Children

A child should have 4 or more bowel motions per week, which are soft and easy to pass.

How to help:

1. Bowel activity occurs about 20 minutes after each meal. The child should sit on the toilet and try for a bowel motion at that time. One of the most important times is after breakfast.
 - The feet should be well supported with a stool.
 - The child should sit and try for a few minutes but no more than 5 minutes.
 - Always ensure the child wipes his/her bottom properly.
2. Tell the child to never ignore the messages the bowel is sending to their brain, if they are able to go to a toilet. When they need to go, they should go.
3. Your doctor or nurse will be able to tell you if your child needs to take any medications to help with their bowel motions. The medications will make their bowel motions soft, more frequent and easier to pass. Make sure the child takes them as directed.
4. The child should drink about 5 or 6 glasses of fluid per day (water is the best option), depending on their age. Your health professional will inform you of the minimum amount, about 50 mL per kg per day.
5. The child should eat fibre in their diet. A variety of fruit, vegetables and cereals such as porridge are good options, aiming at 2-3 serves of fruit and 4-5 serves of vegetables daily.

SECTION TWO



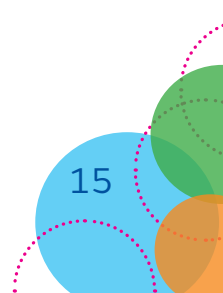
For Primary Care Practitioners

Definitions

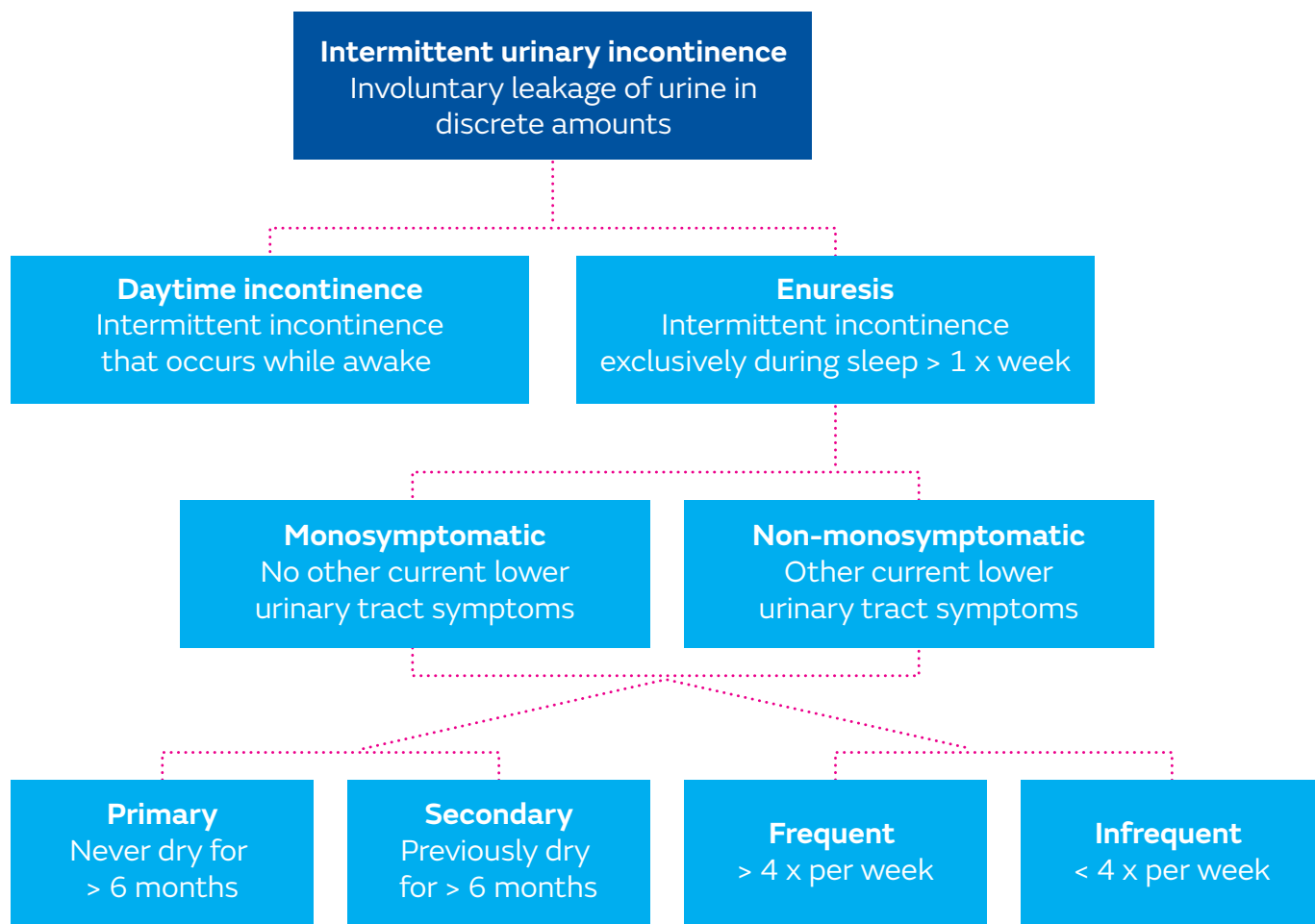
These have been adapted from the official ICCS (1-3) and other official documents.(4,5) The term *enuresis* refers to urinary incontinence during sleep after the age of 5 years. *Nocturnal enuresis* and *enuresis* are used interchangeably. Children with intermittent urinary incontinence may have *enuresis*, *daytime incontinence*, or both.

Bladder bowel dysfunction:	Concomitant bladder and bowel disturbances of clinical significance and relevance. It can be subcategorised into lower urinary tract dysfunction and bowel dysfunction
Increased daytime voiding frequency:	Voiding \geq 8 times per day
Decreased daytime voiding frequency:	Voiding \leq 3 times per day
Urinary incontinence:	Involuntary leakage of urine
Continuous incontinence:	Constant day and night urinary leakage
Intermittent incontinence:	Urinary leakage in discrete amounts
Daytime incontinence:	Intermittent incontinence while awake
Enuresis:	Intermittent urinary incontinence exclusively during sleep
Monosymptomatic:	Enuresis with no daytime lower urinary tract symptoms
Non-monosymptomatic:	Enuresis as well as other lower urinary tract symptoms
Primary:	Never been dry at night for more than 6 months
Secondary:	Have previously been dry at night for at least 6 months
Dysfunctional voiding:	Intermittent and/or fluctuating urine flow rate due to urethral sphincter overactivity during voiding in children with normal neurological function
Nocturnal polyuria:	Nocturnal urine output exceeding 130% of expected bladder capacity for the child's age
Nocturia:	The need to wake at night to void (not uncommon amongst school age children)

<p>Constipation:</p>	<p>Rome IV Criteria (5):</p> <p>2 or more of the following in a child with a developmental age of 4 years or older</p> <p>Must include:</p> <ul style="list-style-type: none"> • 2 or fewer defecations per week • At least 1 episode of faecal incontinence per week • History of retentive posturing or excessive volitional stool retention • History of painful or hard bowel movements • Presence of a large faecal mass in the rectum • History of large diameter stools that can obstruct the toilet
<p>Faecal incontinence (4): (This should replace the term 'encopresis')</p>	<p>Can be constipation associated faecal incontinence (most common) or nonretentive faecal incontinence</p> <p>Constipation associated faecal incontinence</p> <ul style="list-style-type: none"> • Associated with constipation • Child often unaware of incontinence <p>Nonretentive faecal incontinence, must include all of the following in a child with a developmental age of ≥ 4 years:</p> <ul style="list-style-type: none"> • Defecation in places inappropriate to the social context at least once per month • No evidence of an inflammatory, anatomical, metabolic or neoplastic process • No evidence of faecal retention • May have a psychological basis
<p>Expected bladder capacity:</p>	<p>$(\text{Age}+1) \times 30$ (up to max 400 mL)</p>



Classification of Incontinence and Enuresis



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Prevalence

Nocturnal enuresis is common in school age children. Boys are affected more than girls, with the prevalence in 5 to 7 year olds in developed countries around 15%, gradually decreasing as age increases to around 1% to 3% in the teen years.(1-6) Population studies suggest that around a quarter of children with nocturnal enuresis also have daytime incontinence and/or other lower urinary tract symptoms.(7,8) Those who have lower urinary tract symptoms as well as those with frequent enuresis are more difficult to treat and their condition is more likely to persist into adolescence.(1,5,6)

Faecal incontinence and chronic constipation is also common in children with nocturnal enuresis. (9,10) Tertiary referral centres report that between a quarter to a third of children they see with significant constipation who have enuresis will have resolution of their enuresis when the constipation is effectively treated.(6,11–14)

Enuresis is more common in children with:

- *A positive family history*
One large UK study found odds ratios of 3.6 and 1.9 if a mother or father respectively had a history of nocturnal enuresis, and two-thirds have relatives affected.(2,15)
- *Sleep disordered breathing*
In children with enuresis and obstructive sleep apnoea from adenotonsillar hypertrophy, the enuresis resolves in up to half after appropriate surgery.(16–18) However, signs of disordered sleep have been found in enuretic children without adenotonsillar hypertrophy, which may also contribute to reduced daytime quality of life.(19–23)
- *Obesity*
Children with BMIs in the obese range are over six times more likely to have enuresis, and tend not to respond to treatment as well as children in normal weight ranges.(24,25)
- *Attention deficit/hyperactivity disorder (3,4,26)*
- *Autistic spectrum disorder (27,28)*
- *Developmental delay, and physical or intellectual disability (27)*
Children with enuresis are also more likely to have other psychological or behavioural problems and vice-versa, such as oppositional defiance disorder, anxiety and depression. (3,26,29–31)

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Pathogenesis

The three main physiological factors in nocturnal enuresis are:

- Defective sleep arousal.
- Nocturnal polyuria.
- Bladder factors, e.g. lack of inhibition of bladder emptying during sleep, reduced bladder capacity, or bladder overactivity.

The contribution and pathogenesis of these factors vary from child to child.(1) These include:

Genetics

Nocturnal enuresis has long been recognised to cluster in families, and may contribute 50% to 70% of the risk of having the condition. Though some suspected 'enuresis genes' have been found, none explain all cases, and genotype and phenotype correlate poorly.(2–4)

Nocturnal polyuria and vasopressin deficiency

Many enuretic children produce more relatively dilute urine at night, compared with age-matched peers. However, polyuria alone is insufficient as a cause for enuresis, as polyuria can occur in non-enuretic children, who wake to void. As between 20% and 60% of children with monosymptomatic enuresis do not respond to desmopressin therapy, there may also be other abnormal changes in circadian renal function.(1,5)

Nocturnal detrusor function

Detrusor overactivity can occur during the day and/or at night only, though more often in the former. There is a tendency to smaller daytime voided volumes, and an overlap of enuresis with urge incontinence.(6,7)

Sleep and arousal problems

Children with enuresis have more fragmented sleep, are more difficult to arouse than their peers, and have higher levels of daytime sleepiness. EEGs tend to show frequent cortical arousals with an inability to awaken completely. There is debate surrounding whether the problems with sleep are wholly causative, or whether the frequent brain stimulation without waking, contributes to disordered sleep. In either case, disordered sleep is associated with lowered quality of life for the child.(8-10)

Some enuretic children have sleep disordered breathing associated with adenotonsillar hypertrophy, and up to 50% will have remission of enuresis after effective treatment.(11-13)

Developmental/psychological factors

Developmental and other disabilities such as attention deficit/hyperactivity disorder and autistic spectrum disorder have high rates of nocturnal enuresis, and are over-represented in the enuretic population. Recent research points to common pathways in the central nervous system, with similar influences on neuropsychological functioning, sleep, and bladder function control.(14-17)

Delay in neurological maturation

Metabolism is disturbed in the prefrontal cortex and the pons in some children with primary monosymptomatic enuresis, as well as microstructural abnormalities of the neuronal circuits in the prefrontal cortex.(18-21)

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Quality of Life

Children and adolescents with nocturnal enuresis generally have impaired self-esteem and reduced quality of life. The condition negatively affects their relationships with peers and they are at risk of bullying, and family relationships can also be affected. The more severe the enuresis, the more psychosocial difficulties the child faces.(1-6)

The effect on quality of life increases as both severity and age increases. Up to 30% of all children with enuresis show clinically relevant behavioural problems (up to four times non-wetting children), and a similar number may fulfil formal criteria for psychiatric disorders, with those who are non-monosymptomatic having a higher rate, including more fears and anxieties. If left unaddressed these can have a negative effect on treatment adherence and outcome.(7-11) (More details on management of enuresis in children with psychological issues can be found in the specialist section.)

The family is also affected, with parents/caregivers demonstrating reduced quality of life, particularly mothers. They have a higher rate of anxiety and depression than mothers of non-enuretic children, as well higher scores in screening tests for other psychiatric symptomatology, both reactive to their child's enuresis as well as pre-existing factors.(2,12-14)

However, many parents/carers may not consider enuresis a significant medical problem, and some believe laziness, defiance, behaviour problems or attention seeking are the major causes. Parents often underestimate the impact of enuresis on the child's self-esteem, relationships and general quality of life, particularly the increasing impact as the child ages.(5,11,15,16)

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Assessment

It is important to allow sufficient time for a thorough assessment and to formulate a plan with the child and parents.

History

- Family history of enuresis or urinary incontinence
 - Severe enuresis in parents is linked to severe enuresis in children, with related lower response to treatment.(1)
- Urinary symptoms
 - Frequency and severity of wetting
 - Urgency
 - Voiding frequency
 - Dysuria or pain
 - Voiding symptoms (hesitancy, straining, weak stream, intermittency, dysuria)
 - Holding manoeuvres
 - Urinary retention
 - Urine stream
 - Post micturition dribble

The initial assessment should determine:

- if enuresis is monosymptomatic (MNE) or non-monosymptomatic (NMNE);
- if it is primary or secondary;
- the severity of enuresis and of any other symptoms.

Pathogenic differences exist between these groups, with children with NMNE, secondary enuresis and more severe symptoms being less likely to respond to first line treatment, more complicated to manage and having a longer duration to achieve dryness.(2-4)

- Bowel history

Enuresis is often associated with chronic constipation and faecal incontinence; in those with constipation and enuresis, enuresis will resolve in up to two thirds of children after the constipation is successfully treated.(5-8)
- Fluid intake and diet

Fluid restriction during daytime may reduce the bladder volume and ratio of volume to overnight urine production. It maybe useful to limit pre-bedtime fluid intake.(9)
- Sleep history

Children with enuresis are more difficult to arouse than their peers, have more fragmented sleep, and higher levels of daytime sleepiness. There is also a higher prevalence of sleep disordered breathing, and the child may need assessment for adenotonsillar hypertrophy.(10-14)

- General health (including developmental delay, ADHD, ODD and other mental health history)
Enuresis may be a symptom of an undiagnosed medical condition such as diabetes or kidney disease. The presence of attention deficit/hyperactivity disorder, autistic spectrum disorder or other physical, psychological or behavioural disabilities can complicate management and signal the need for greater input and support. The Short Screening Instrument for Psychological Problems in Enuresis (SSIPPE) is a useful, validated instrument for screening for emotional problems and symptoms of attention deficit hyperactivity disorder in a population of children with enuresis.(2,3,15-17)
- Home, school and family situation
A co-operative and supportive home life is important in enuresis management. Most children with enuresis have reduced self-esteem and quality of life. Not only does the condition negatively affects a child's relationships with peers and increase the risk of bullying, family relationships are often affected too. Many parents are frustrated by the continuing enuresis and believe the child at fault, and the situation tends to worsen as the child ages.(18-23)

Physical examination

- Abdominal
- Spine and neurological
- Perineum/genitalia
Physical examination is aimed at assessment for constipation, and neurogenic and urological causes of enuresis.(2,24)

Investigations

- Urinalysis ± urine culture.
Glycosuria suggestive of diabetes mellitus must be immediately excluded and proteinuria in repeat samples should prompt investigations for kidney disease. Culture and urinalysis will also detect bacteriuria or pyuria.(2,25)
- Bladder diary (frequency-volume chart).
A bladder diary for 48 hours provides objective data, helps detect children with NMNE and those needing further evaluation.(2,26)
- ± Renal ultrasound and post void residual.
A renal and bladder ultrasound (RBUS) or urodynamic studies (UDS) are not usually necessary in the initial assessment, particularly for monosymptomatic enuresis, and can lead to unnecessary additional investigations and parental concern. RBUS and UDS play a more important role in patients who are resistant to treatment.(4,24,27,28)
Non-invasive uroflometry and post void residual assessment are available in some specialised bladder and incontinence clinics.

In children with constipation an abdominal ultrasound to measure the rectal diameter may be useful. A rectal diameter larger than 3 cm is considered suggestive of chronic constipation.(5)

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Red flags for Early Referral to Specialists or Specialised Centres

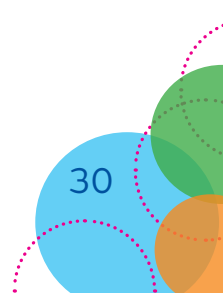
Some children with nocturnal enuresis will require referral and management by specialist urologist and/or a multidisciplinary team, and in some cases should be fast-tracked. Indications for referral are:

- True and continuous urinary leakage. May suggest a neurogenic or structural anomaly that needs intervention.(1,5)
- Children whose psychosocial well-being are at risk.(1,4) Due to the urinary incontinence including adolescents, and children with psychological problems, they should be fast-tracked to a multidisciplinary approach to care. Older girls appear to be most at risk.
- Refractory incontinence(1) (i.e. treatment failure after 6 months) is classified as complicated urinary incontinence.
- A history of recurrent urinary tract infections.(2) To exclude predisposing urological conditions.
- Severe daytime symptoms (1-3) such as voiding symptoms (hesitancy, intermittency, genital or lower urinary tract pain, straining and feeling of incomplete emptying), as they merit urine flow studies and radiological evaluation to exclude dysfunctional voiding or obstructive pathologies.
- Known or suspected physical or neurological problems.(2,6) Subtle abnormalities of the spinal cord (eg spina bifida occulta) or neurological insults in the recent past can present with urinary incontinence as a symptom of the underlying neurogenic bladder. Often the only pointers of spina bifida occulta are the cutaneous lesions over the sacral region.
- Comorbid conditions (2,5,6) such as faecal incontinence or diabetes.
- Significant attention, developmental, behavioural, or emotional problems.(3,6)
- Family problems or vulnerabilities.(3,5,6)

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Initial Management

The first step is to determine whether the child has monosymptomatic nocturnal enuresis (MNE), or has other lower urinary tract symptoms and hence has non-monosymptomatic nocturnal enuresis (NMNE). Some features are cause for immediate referral: see Red Flags.

- MNE: For young children not bothered by the enuresis active treatment may not be warranted. Spontaneous resolution rate of MNE is 15% per year.(1)
- NMNE: The priority is treating the daytime bladder symptoms first; consider comprehensive evaluation to determine what strategies are likely to be most effective e.g. whether the child has a small or overactive bladder (see below).(2)

When daytime symptoms are resolved, if nocturnal enuresis persists then it can be specifically addressed.

Bladder management/urotherapy

Initial management for both MNE and NMNE consists of conservative measures aimed at rehabilitation of the lower urinary tract and bowel function, i.e. standard urotherapy.(1)

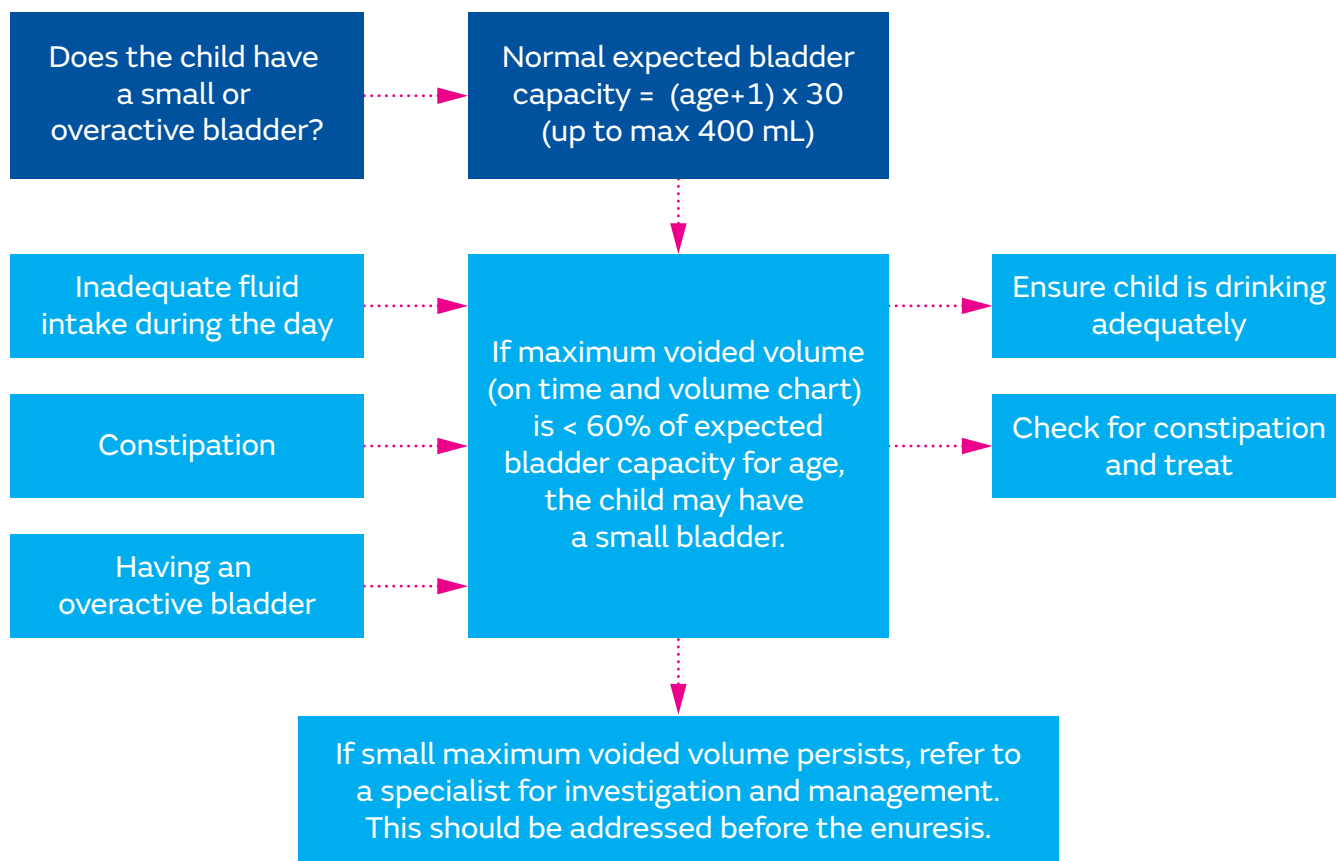
1. Information and demystification
 - Explanation about normal function and differences in the child's condition.
 - See Bedwetting: Basic Facts for Parents and Carers printable sheet in section four.
2. Instructions in establishing optimal micturition and bowel function
 - Regular voiding, proper voiding posture, avoidance of voiding postponement and regular bowel movements.
 - See the following printable sheets in section four:
 - Bladder Management
 - Tips for Relaxed Voiding for Children
 - Bowel Program
3. Establish guidelines for diet and fluid intake
4. Document symptoms and voiding habits
 - See Frequency/volume chart and/or mobile apps in section four.
5. Support and encouragement
 - Regular and frequent follow-up with the caregiver/treating team.

Points to note with parents:

- Lifting and scheduled waking to void during the night may reduce wet beds, but don't teach the child to become dry independently.
- Pull ups or nappies can reduce washing, but doesn't help the child to become aware of when they wet.
- If the enuresis persists once the underlying bladder disorder has been addressed, move on to specific enuresis therapy.

Determination of bladder function in non-monosymptomatic enuresis(2)

For a child with NMNE, consider whether the child has a small or overactive bladder.



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Alarm vs Desmopressin

If conservative measures have failed to achieve nocturnal dryness, management will then be alarm therapy or desmopressin.

A Cochrane review of alarm therapy concluded that it remains effective after treatment stops for about half the children with nocturnal enuresis, though the addition of ‘overlearning’ when the child has become dry reduces the relapse rate further.(1) Alarm therapy needs commitment from both child and family, and a supportive and knowledgeable health professional.

A Cochrane review of desmopressin for nocturnal enuresis concluded that desmopressin rapidly reduced the number of wet nights per week, but the effect was not sustained after treatment stops in a fair proportion.(2) Patients and their families need to be aware of potential adverse effects of desmopressin, particularly that children should not drink more than 240 mL (8 ounces) of fluid from 1 hour before to 8 hours after taking the desmopressin in order to avoid the possible risk of water intoxication.

A more recent review of studies comparing alarm and desmopressin therapy directly found that while at cessation of therapy there was generally no difference between the two in the short term, alarm therapy was more effective than desmopressin in the long term.(3) Some studies reported a higher initial attrition rate in families and children who used alarm therapy compared with those on desmopressin, as they needed more support to continue with alarm therapy, but those who persisted were more likely to have sustained improvement in enuresis.

If children use desmopressin when they begin alarm training, they have fewer wet nights while they use desmopressin but alarm training still takes just as long and relapse rates are no better after stopping treatment.(3)

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Alarm Training

Alarm training is first line therapy for monosymptomatic nocturnal enuresis if conservative measures have not resolved a child's enuresis, and has a 65-80% success rate. It will generally be the therapy of choice for non-monosymptomatic enuresis once other lower urinary tract issues have been resolved. About half who persist with alarm training remain dry after treatment is completed, without further measures.(1-3)

- Alarms condition the child to wake to void when their bladder is full and hold on when they do not need to void during the night.(4,5)
- The enuresis alarm detects when the child wets and emits a noise or vibration, alerting that the child has wet.
- When the alarm sounds, the child needs to wake and try and void in the toilet (even if they don't feel they need to void). Often children do not wake to the sound of the alarm (even if the rest of the family does). Parents need to wake the child if the child is unable to wake themselves.(6,7)
- Alarm training takes 2-3 months. The child should continue alarm therapy until they have had 14 consecutive dry nights.(1)
- If relapse occurs, repeating alarm training will often produce a good response.(3,8)

“Overlearning” on the alarm

“Overlearning” is particularly helpful in a child who has learnt to be dry by sleeping through the night, as it appears to teach the child to wake to void if they need to, and reduces relapses rates after ceasing treatment.(3,9,10)

“Overlearning” occurs after successful alarm training; in other words, after the child has achieved 14 consecutive dry nights. The child then has a large drink each night before bed and continues with alarm training, until a further 14 consecutive dry nights have been achieved.

See “Overlearning” on the alarm printable sheet in section four

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Desmopressin

Desmopressin is an antidiuretic, a synthetic analogue of the hormone vasopressin. Its use in nocturnal enuresis is in reduction of overnight urine production. However recent studies have pointed to an additional effect on the arousal mechanisms.

- About 70% of children with MNE will have a response to desmopressin; around 30% will be full responders, and a further 40% will have a partial response with a reduction in the number of wet nights per week.(1,2)
- It tends to have a lower rate of early attrition and induce an earlier response compared with alarm training, but the response tends not to be sustained on withdrawal of the medication. (1-3)
- Older children with nocturnal polyuria and fewer wet nights per week are more likely to respond to desmopressin.(2,4)
- It is usually well tolerated, with adverse effects such as headaches, abdominal pain and emotional disturbance being uncommon. The most serious adverse effect reported for desmopressin is hyponatraemia, so fluids should be restricted from 1 hour before medication intake until 8 hours after.(1,5)
- Desmopressin is useful for short term use such as sleepovers or camps, or when alarm training is difficult or contraindicated (e.g. when family are not supportive).(5,6)

Availability and dosage

In Australia, desmopressin (MINIRIN®) is indicated for primary nocturnal enuresis in patients who are refractory to an enuresis alarm or in whom an enuresis alarm is contraindicated or inappropriate.

Desmopressin is available via authority prescription (streamlined) in the following formulations:

- Melts (oral lyophilisate) 120 micrograms or 240 micrograms.
- Tablets 200 micrograms.
- Nasal spray 10 micrograms/puff, but with a higher risk of adverse effects.

Melts are often used in primary-age children because, compared with tablets;

- They are easy to take, preferred by children under 12 years, and may enhance adherence. (7,8)
- It has smaller variance in plasma concentration with low food interaction, which can be relevant in younger children who may have a short interval between the evening meal and bedtime.(9,10)
- No water is needed, so it is easier to comply with restriction of fluid intake.(2)

Because of the higher risk of side effects with the nasal formulation (possibly due to overdose), the melt or tablet formulation is recommended in preference to the nasal spray.(11)

The recommended daily dosage of desmopressin melt formulation is 120-240 micrograms and the tablet formulation is 200-400 micrograms taken once daily around one hour before bedtime with appropriate precautions.

Withdrawal/relapse commonly occurs when desmopressin is ceased. However, there is less relapse with a gradual structured withdrawal compared with abrupt withdrawal.(1,12-15)

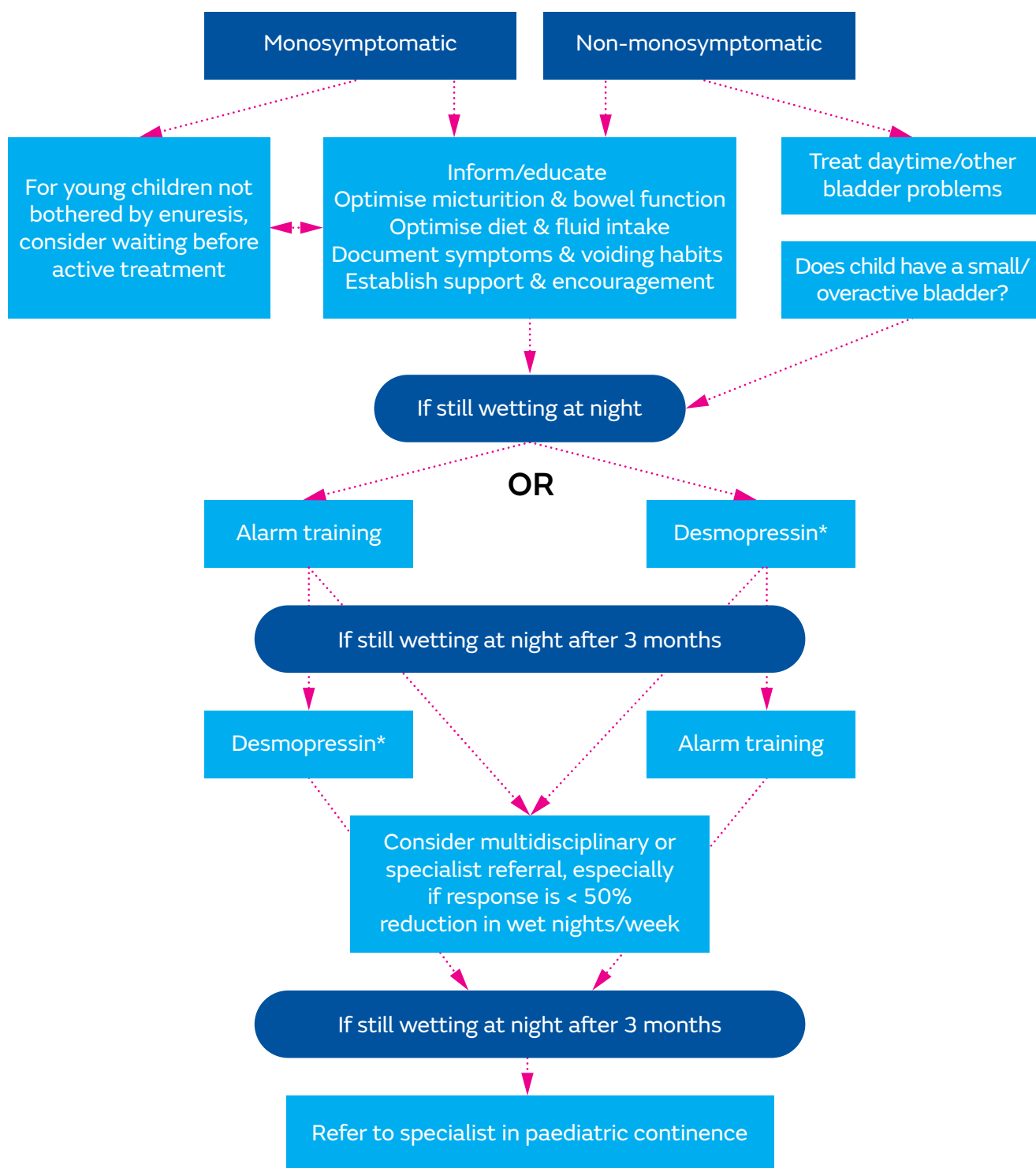
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Algorithm: Nocturnal Enuresis Management in Primary Care

It is recommended that management is initiated in the community under the supervision of a doctor or suitably experienced, trained and qualified nurse or allied health professionals.

Exceptions are identified in the section *Red Flags*.



*In Australia desmopressin (MINIRIN®) is approved and PBS-listed as second-line therapy to an alarm

SECTION THREE



For Specialists

Sleep and Enuresis

Parents of most children with enuresis report that their child is difficult to arouse from sleep. Enuretic children have poorer sleep quality, with fragmented sleep and higher rates of daytime sleepiness, than their non-enuretic peers. They also have a higher prevalence of sleep disorders such as obstructive sleep apnoea, frequent waking, sleep disordered breathing, parasomnias and sleep related movement disorders.(1–7)

Early studies on sleep in enuresis found that enuretic episodes were not linked to any specific sleep stage, and there was little difference in sleep architecture compared to controls, apart from an increased number of sleep cycles and short movements. More recent work shows that the sleep of children with enuresis is more fragmented, demonstrated by a higher incidence of periodic limb movements in sleep (PLMS) associated with cortical arousals, resulting in poorer sleep quality overall.(3,8–12)

One explanation of this sleep pattern is that bladder overactivity leads to frequent cortical arousals but an inability to awaken completely, with the long-term overstimulation by signals from the bladder causing paradoxical suppression of arousal. It is clear that children with enuresis do not have optimal sleep, and most are likely to be sleep deprived at some level, leaving them difficult to arouse and sleepier in the daytime, but still with longer sleep latency and more frequent awakenings at night than their peers. However, no consistent association has been found either between cortical arousals and enuretic episodes or between sleep patterns and enuretic parameters.(1,3,11–13)

Another explanation is faulty circadian regulation, with involvement of the autonomic nervous system and sympathetic output responsible for both cortical arousals and PLMS. A number of studies have found nocturnal arterial blood pressure to be higher in enuretic children who fail to have the 10% nocturnal drop of non-enuretic children. Higher nocturnal blood pressure and suppressed levels of angiotensin II are also correlated with changes in circadian control of renal function and urine production in children with nocturnal polyuria.(3,12–20)

Sleep disordered breathing

Sleep disordered breathing (SDB) is not a distinct condition but refers to a syndrome of upper airway dysfunction during sleep, characterised by snoring and/or increased respiratory effort secondary to increased upper airway resistance. Obstructive sleep apnoea (OSA) in children refers to prolonged partial upper airway obstruction and/or intermittent complete obstruction, disrupting normal ventilation and sleep patterns. A definitive diagnosis of OSA is generally only made via a clinical sleep study.(21–23)

Children with nocturnal enuresis are significantly more likely to have sleep disordered breathing and obstructive sleep apnoea than their peers. Similarly, children with SDB have an increased prevalence of enuresis. This may be mediated by brain natriuretic peptide (BNP), released from cardiac myocytes; upper airway obstruction causes increased intrathoracic pressure swings, leading to increased venous blood return and atrial distension, triggering BNP release which increases urinary output and natriuresis. Children with SDB and enuresis have higher BNP levels than those with SDB without enuresis.(24–29)

Symptoms of SDB and OSA in children differ to those that present in adults:

- Children are often normal weight or are underweight.
- Obstructive episodes are much shorter.
- Snoring may be continuous, rather than intermittent with pauses.
- Mouth-breathing is common.
- Arousal is less noticeable, and they rarely rouse to consciousness.
- Adoption of unusual sleeping positions, such as knees to chest or neck hyperextension.
- Daytime sleepiness may not be a feature; instead, behavioural changes can occur, which may be subtle but can include hyperkinesia and inattention, and mimic ADHD.
- Neurocognitive deficits and learning problems can occur.

Specialist input from sleep/respiratory physicians and/or ENT surgeons is recommended. The most common condition associated with SDB in children, including those with enuresis, is adenotonsillar hypertrophy. Adenotonsillectomy remains the definitive treatment, and up to half will have remission of enuresis post-surgery, as well as improvements in behaviour and cognition. In some cases continuous positive airway pressure (CPAP) is an option, particularly in children without significant adenotonsillar obstruction.(21,23,27,30–35)

Melatonin and treatment of sleep disorders

In a study of children with sleep problems who had treatment resistant enuresis, the use of melatonin resulted in an improvement in the enuresis when the melatonin was added to the standard treatment. A similar response was seen when the sedative clonidine was added to standard therapy in treatment resistant enuretic children. In contrast when melatonin was used as monotherapy in children with treatment resistant enuresis, the melatonin showed little effect. This suggests that the use of sedatives as an adjunct to standard enuresis therapy may be useful in treatment resistant children by improving their sleep and thereby their ability to arouse to void at night, particularly for those with an underlying sleep problem.(36-38)

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Enuresis and Other Conditions

Up to 30% of all children with enuresis show clinically relevant behavioural problems, which is about four times more than non-wetting children, and a similar number may fulfil formal criteria for psychiatric disorders.

Attention deficit/hyperactivity disorder (ADHD)

The prevalence of ADHD is higher in children with nocturnal enuresis compared with the normal population; in a recent review, the rates of ADHD among children with nocturnal enuresis in clinical studies ranged from 9.1% to 53.2%. The reverse also holds, that among children with ADHD there are higher rates of enuresis (of the order of 2 to 3 times) compared with children without ADHD. (1–6)

Children with ADHD and enuresis make up a subgroup who differ from both children with enuresis only and ADHD only. Studies have shown they differ in attention performance, process emotions more intensely, and have different needs in management. (2,7–9)

The correlation of enuresis in children with ADHD appears to be due to developmental delay of brainstem centres, so that stimuli from the bladder don't register during sleep and wake the child, and/or the micturition reflex isn't inhibited during sleep. Metabolism may be disturbed in the prefrontal cortex and the pons in children with primary monosymptomatic enuresis. They may also have microstructural abnormalities in the neuronal circuits in the prefrontal cortex, which may support the theory of delayed maturation. (2,10–13)

There is also considerable overlap in various regions of the brain shown to be affected in both nocturnal enuresis and ADHD, including the locus coeruleus, which is involved in arousal, and the pontine micturition centre, which is important in the inhibition of micturition reflex in sleep and bladder control. The anterior cingulate cortex and regions of the prefrontal cortex, which are responsible for monitoring and control functions, emotion regulation and conscious attention, are also involved in both enuresis and ADHD, as well as the thalamus, which relays sensory and motor signals to the cortex and contributes to the regulation of consciousness, sleep, and alertness. Studies in both neurophysiology and imaging have shown similar differences in functional neural processing in children with ADHD and enuresis. (2,9,14–16)

Given the large proportion of children with enuresis with attention deficit/hyperactivity disorder, management which includes targeting of ADHD when present is essential if substantial progress is to be made towards the goal of becoming dry at night. Children with ADHD tend to have higher dysfunctional voiding symptoms in NMNE, and in both MNE and NMNE are more difficult to treat, whether with alarm training or medication. They also have lower adherence rates and poorer treatment outcomes. In severe cases of ADHD, this needs to be addressed before enuresis can be treated, so that sufficient cooperation and adherence is possible for a reasonable outcome. (2,8,17,18)

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Autistic spectrum disorder (ASD)

Children with autistic spectrum disorder (ASD) have a higher rate of nocturnal enuresis.(1-3) They are also more likely to have lower urinary tract symptoms, particularly urgency and voiding postponement, and so are more likely to have non-monosymptomatic enuresis, particularly those with more severe language and social impairment.(2)

Reduced levels of oxytocin and vasopressin have been demonstrated in children with ASD, and the administration of vasopressin analogs increases their goal-directed behaviour.(4) A common pathway in vasopressin deficiency may be partly responsible for increased rates of enuresis even in high functioning ASD.(4)

There is comparatively little research in enuresis in children with ASD as opposed to ADHD, but studies suggest treatment needs to be longer and involve multiple modalities, given that these children show higher rates of psychological symptoms and comorbid psychological disorders.(2)

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Obesity

Reports of the effect of obesity on the risk of nocturnal enuresis vary, but a number of studies have shown an increased risk with higher body mass index, as well as lower rates of response to treatment.(1-3) The relationship between obesity and higher rates of overactive bladder and daytime lower urinary tract symptoms is clearer, which has relevance to treatment of the daytime symptoms in non-monosymptomatic enuresis.(4-7) More detailed information can be sought from the listed references.

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Children with structural anomalies of the urinary tract

A small proportion of children with nocturnal enuresis have a previous history of structural anomalies of the urinary tract and an even smaller proportion (12%) will have a structural abnormality detected on a baseline renal tract ultrasound. Routine history should enquire into past diagnoses and interventions.(1-3)

In most cases treatment for enuresis should be no different to other children. However, the effect of prior surgery on the bladder or the urethra should always be borne in mind and expert opinion from a Paediatric Urologist sought if response to treatment is suboptimal.

Of note are children born with posterior urethral valves who present with enuresis with significantly high urine volumes at night. The associated renal dysplasia may result in nephrogenic diabetes insipidus and hence, a limited response to standard doses of desmopressin. The evidence for efficacy of supranormal doses is currently limited and will perhaps, evolve in the future.(4)

The other group are those with an ectopic ureter who may present with day and night time urinary leakage due to the abnormal connection of the ureter to the genital tract, introitus or distal urethra. Continuous dampness between “normal voids” should raise the suspicion and specialist input is indicated.

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Psychological Screening

Behavioural and psychological problems are present in 20–30% of all children with nocturnal enuresis, which is double the rate found in non-wetting children.(1) Problems may be internalising (e.g. anxiety, depression) and externalising (e.g. oppositional defiance and conduct disorders).

Children with non-monosymptomatic enuresis show more symptoms than those with monosymptomatic, and those with secondary enuresis more than primary. Secondary enuresis has a higher rate of preceding stressful life events as well as pre-existing behavioural disorders, and is more likely to persist into adolescence.(3)

Behavioural and psychological issues may arise as a result of the enuresis, may precipitate enuresis or induce a relapse, or both problems may be due to a common neurobiological cause. There may also be a coincident problem, as there is a 10%-15% prevalence of behavioural/psychological disorders in the general population.(1-8)

Regardless of the causation, behavioural and psychological issues have a negative effect on treatment adherence and outcome.(2) It is important to identify any mental health issues in enuretic children, in order to both treat the disorder as appropriate and to maximise the potential for successful enuresis treatment.

The Short Screening Instrument for Psychological Problems in Enuresis (SSIPPE) is a validated questionnaire derived from the Child Behaviour Checklist.(9) It consists of 7 items for emotional problems, 3 for attention problems and 3 for hyperactivity/impulsivity. This quick screening instrument is a useful tool for detecting children who may benefit from psychological/psychiatric assessment and management.(1,2,9)

Short Screening Instrument for Psychological Problems in Enuresis (SSIPPE): Items and Scoring

Emotional problems

If more than two positive items: full screening required

- | | | | |
|----|---|-----|----|
| 1. | Has your child sometimes the feeling that others are reacting negatively? | YES | NO |
| 2. | Does your child sometimes feel worthless or less confident? | YES | NO |
| 3. | Does your child sometimes have headaches? | YES | NO |
| 4. | Does your child sometimes feel sick? | YES | NO |
| 5. | Does your child sometimes have abdominal pain? | YES | NO |
| 6. | Is your child sometimes little active or lacking energy? | YES | NO |
| 7. | Does your child sometimes feel unhappy, sad or depressive? | YES | NO |

Inattention symptoms

If more than two positive items: full screening required

- | | | |
|--|-----|----|
| 8. Does your child frequently pay insufficient attention to details or make careless defaults in schoolwork? | YES | NO |
| 9. Does your child frequently have difficulties with organising tasks and activities? | YES | NO |
| 10. Does your child frequently forget in daily practice? | YES | NO |

Hyperactivity/impulsivity symptoms

If more than two positive items: full screening required

- | | | |
|---|-----|----|
| 11. Does your child frequently talk continuously? | YES | NO |
| 12. Is your child frequently busy? | YES | NO |
| 13. Does your child frequently run or climb in situations in which this is inappropriate? | YES | NO |

See section four for the printable version of this screening tool.

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Refractory Enuresis: An Overview of Causes and Treatment Options

See Red Flags in section two for Primary Care Practitioners.

Despite effective interventions being available, 50% of children with enuresis fail to respond to standard treatments or relapse after initial treatment success.(1-3)

Causes of treatment failure include:

1. *The child has non-monosymptomatic enuresis and an underlying lower urinary tract problem*

It is important to assess the child's bladder function by completing a time and volume chart, which can identify whether the child may have a small or overactive bladder. If the child's maximum daytime voided volume is less than 65% of the expected capacity, the problem of the small bladder need to be addressed (with urotherapy, treatment of constipation, anticholinergics and/or TENS) before commencing desmopressin or alarm training.

2. *The child has failed treatment with desmopressin*

Children with nocturnal enuresis may fail to respond to desmopressin therapy if their overnight urine volume exceeds their bladder capacity (for example if they have nocturnal polyuria) and they are unable to wake to void. In this instance they may need alarm training to train them to wake to void when their bladder is full during sleep.

3. *The child has failed alarm training*

30% of children fail alarm training and 50% of those who become dry with alarm training relapse. The most common reason for alarm failure is failure of the child to wake in response to the alarm stimuli. Correct positioning of the enuresis alarm, parental supervision and motivation and positive reinforcement of correct behaviour (i.e. for waking to void when the alarm sounds) enhances treatment success.(4,5) Some children who relapse after initial success may not have had adequate time using the enuresis alarm, as alarm training generally takes 2-3 months. Others may be intermittently dry by sleeping through the night, but relapse because they are unable to wake to void when their overnight urine volume exceeds their bladder capacity. These children will benefit from alarm training with overlearning, where they have a large drink at bedtime and continue to wear the enuresis alarm, so that they eventually learn to wake to void.(6,7)

4. *The child has other comorbidities*

Children with conditions such as constipation and faecal incontinence, obstructive sleep apnoea, ADHD, autistic spectrum disorder and other behavioural disorders, treatment non-adherence and neurodevelopmental conditions may respond poorly to standard treatment. (see preceding sections for details and references). Utilising an interprofessional approach with input from other disciplines to address various aspects of the treatment failure is helpful. For example, continence nurses can provide urotherapy advice, regular follow up, advice about continence products and educate about available resources and funding; continence physiotherapists can help the child by improving posture and body awareness, normalise pelvic floor muscle capabilities, teach relaxed voiding techniques, retrain muscle

patterns to improve coordination for bladder and bowel emptying and educate the child and family in using neuromodulations (such as parasacral TENS); psychologists can help support the child and family with treatment adherence and by identifying and addressing psychosocial barriers to treatment adherence. They can also provide treatment for comorbid mental health conditions which may contribute to treatment resistance.

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Additional Management Options for Specialists

A. Advanced Pharmacotherapy

Oxybutynin

Oxybutynin is an anticholinergic, and works by suppressing detrusor overactivity and so increasing effective bladder volume when combined with urotherapy.(1)

It is not recommended as a first-line therapy in nocturnal enuresis, particularly if monosymptomatic. Oxybutynin is used in:

- Non-monosymptomatic enuresis for a child with an overactive bladder, who has a bladder volume less than 60% of expected bladder volume for age, after failure of non-pharmacological methods to decrease detrusor overactivity.
- Combination therapy in alarm and/or desmopressin-resistant enuresis.

Oxybutynin will generally be used under the supervision of a specialist.(2–6)

- It is contraindicated in urinary retention or in children with infrequent voiding who have a large bladder.
- It is important to continue bowel management while on an anticholinergic to avoid constipation, which is a common adverse effect.(2)
- When using oxybutynin in NMNE, to gain the most effect it should be given at a time of day which will ensure peak levels when wetting is most severe (day or night).(2)
- Adverse effects of oxybutynin may be more common in paediatric patients compared with adults, so it is important to explain possible effects to parents/carers and children, and what action should be taken should they arise. Common adverse effects include:(7,8)
 - Oral; dry mouth, dysphagia.
 - Visual; dry eyes, blurred vision.
 - Gastrointestinal; abdominal pain, nausea, diarrhoea, constipation, bloating.
 - Central nervous system; hallucinations, agitation, sedation, confusion, amnesia, nightmares.
 - Incomplete bladder emptying and urinary retention.
- An alternative option for oxybutynin tablets is the transdermal patch form, which delivers sustained release and results in fewer side effects.(9,10)

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Tricyclics

Tricyclic antidepressants were the first medications used for nocturnal enuresis. They act on the central nervous system by blocking synaptic alpha receptor reuptake of noradrenaline and serotonin into the neurons, which accounts for their antidepressant effect. The exact mechanism of action in enuresis is not certain, but there may be several pathways:

- A direct antispasmodic effect on the smooth muscle of the bladder.
- Promote vasopressin release.
- An effect on the sleep centre in the brain, which may improve arousability.

The effects used to be attributed to its anticholinergic effects, but imipramine can be effective in children who have not responded to anticholinergic therapy, suggesting another mechanism may also be at work.(1–6)

A Cochrane review found that:(5-7)

- Imipramine is more effective than placebo, particularly for short-term outcomes.
- Amitriptyline and desipramine were more effective than placebo, but nortriptyline and mianserin showed no difference.
- Outcomes between tricyclics and desmopressin were similar.
- Outcomes are mixed when comparing tricyclics and anticholinergics.
- When imipramine was compared with desmopressin plus oxybutynin, imipramine was less effective.
- Tricyclics were less effective than alarms, in both the short term and long term after ceasing treatment.
- Tricyclics combined with alarm therapy were no more effective than alarm monotherapy.

Tricyclics are used only as third line therapy, in treatment-resistant enuresis, because:

- Tricyclics have the potential for serious adverse effects, including cardiotoxicity, convulsions, and hepatic and haematological reactions.
- Minor adverse effects are common, including dizziness, headache, mood changes and gastrointestinal problems.
- Although they are effective in reducing enuresis in the short term, they do not have a sustained effect when treatment ceases.

There is some evidence, though limited, that combining tricyclics with other therapies such as anticholinergics may be effective. (See Combination Therapies) (1,2,5)

The recommended dosages of imipramine are:

- From 25 mg for six-year-olds (weight 20 to 25 kg) to 50 to 75 mg for those over 11 years. Imipramine should not be given to children under six years of age. The dose should not exceed 75 mg daily.
- The maximum period of treatment should not exceed three months and withdrawal of medication needs to be gradual.
- Electrocardiograph (ECG) monitoring is recommended and a full physical examination should be given before a further course is prescribed.

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Combination Therapies

In children who have not adequately responded to alarm or drug monotherapy, combining alarm therapy with appropriate drug treatment may be indicated.

Alarm and desmopressin

Alarm treatment and desmopressin is the most well-studied combination. A Cochrane review in 2009 found that when using desmopressin combined with alarm treatment, children had fewer wet nights compared with using alarm treatment alone, but there were no significant differences either in overall failure rates or relapse after treatment stopped. However, the six trials included children with no previous treatment as well as children who had a range of previous treatments including desmopressin or alarms, and included a spectrum of monosymptomatic and non-monosymptomatic enuresis, which needs to be taken into consideration in interpretation of these findings.(1-7)

Two more recent randomised trials have been conducted in treatment-naïve children. They found that combined alarm/desmopressin treatment results in fewer wet nights initially than alarm treatment alone, but there is no difference by three months and the relapse rate after cessation of treatment may be higher.(8-9)

Alarm and anticholinergics

One retrospective study showed that routinely adding an anticholinergic to alarm treatment after initial failure does not improve response rates. A randomised controlled trial also showed that combined oxybutynin and alarm treatment did not improve response rates compared with alarm treatment alone.(10,11)

In both these studies, however, the children had monosymptomatic enuresis. Those in the retrospective study were also treatment-naïve, as were the majority (about two-thirds) in the randomised trial. As anticholinergics are usually recommended for non-monosymptomatic enuresis, it is intuitively appropriate to commence alarm training on children while they remain on anticholinergic medications for non-monosymptomatic nocturnal enuresis. In the absence of adverse effects or other medical reasons, the anticholinergic medications should only be weaned after successful alarm training. Nevertheless, further research is needed in this area.

Alarm and tricyclics

There is no current evidence that tricyclics combined with alarm therapy are more effective than alarm monotherapy or alarm combined with desmopressin.

A systematic review found no difference between combined alarm and imipramine therapy compared with alarm monotherapy in the number achieving a complete response at the end of treatment. There was also no difference between combined alarm and imipramine therapy with combined alarm and desmopressin therapy.(11–13)

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Desmopressin and anticholinergics

While anticholinergics are used to treat the daytime symptoms of some children with non-monosymptomatic enuresis, they may also be used in combination with desmopressin in both monosymptomatic and non-monosymptomatic enuresis in children with resistance to alarm and desmopressin monotherapy. Children with treatment-resistant enuresis, including those with partial responses to desmopressin, are more likely to have detrusor overactivity contributing to their enuresis, and so benefit from anticholinergic treatment.(1-3)

A recent meta-analysis found that desmopressin plus an anticholinergic was associated with a better immediate 1-month response rate than desmopressin alone. However, treatment-resistant patients had a response rate twice that of treatment-naïve patients on this combination, suggesting it should be reserved for those who do not respond to initial management.(4-8)

In one trial desmopressin plus oxybutynin was also more effective than imipramine in reducing frequency of enuresis.(5)

There is some evidence that when used in combination with desmopressin, increasing the dose of oxybutynin from 5mg to 7.5mg or 10mg, depending on patient response, has the potential to increase response rates.(9)

Desmopressin and tricyclics

The research about the effects of combining desmopressin with tricyclics is uncertain. One trial compared desmopressin plus imipramine combination therapy with desmopressin monotherapy, and found that the combination was more effective at the end of treatment (15% versus 40% failing to achieve 14 consecutive dry nights).(10,11)

Two trials of desmopressin plus a tricyclic combined therapy was compared with the tricyclic monotherapy, one using imipramine and one using amitriptyline. In both trials there was no difference in outcomes between the combination and monotherapy.(10–12)

Anticholinergics and tricyclics

A systematic review found that combined therapy with imipramine and oxybutynin was superior to imipramine monotherapy, with around two fewer wet nights and with more children achieving a full response at the end of treatment than with imipramine monotherapy (48% vs 74% failing to achieve 14 consecutive dry nights). At follow-up, the combination therapy group also had more children with a full response and fewer relapses.(10,13,14)

However, the children in both these studies had monosymptomatic enuresis without any prior pharmacological therapy, so further research is needed in treatment-resistant patients.

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B. Non Pharmacological Tools and Techniques

Pelvic floor training

Pelvic floor training may be useful with children who have non-monosymptomatic enuresis, with daytime urinary incontinence and dysfunctional voiding, i.e. intermittent and/or fluctuating flow rate due to urethral sphincter overactivity during voiding (often leading to incomplete bladder emptying, frequent urinary tract infection and incontinence).(1) Dysfunctional voiding is suggested when large post void residuals are found on ultrasound and may be confirmed by repeat uroflow measurements showing a staccato voiding pattern, or by urodynamic investigation.(2-4)

The main objective is to enable children to be aware of their pelvic floor muscles and be able to relax them during micturition and defecation to facilitate complete bladder and bowel emptying, as well as ensuring normal physiological tone to support continence.(3)

One form of pelvic floor training is biofeedback, in which a child is made aware of pelvic musculature and their contraction and relaxation by visual and/or acoustical signals.(5-7) Biofeedback can simply be taught by requesting the child listen to the sound of their urine flow and to ensure, by relaxing their pelvic floor muscles, the flow of the urine is even and consistent. Biofeedback helps increase children's awareness of abdominal muscle activity and perineal muscle movement. Visualisation of electromyographic activity of pelvic muscles can also be done via real time ultrasound or computerised sensors and display, and may be combined with visualization of real-time uroflow or interactive computer games. The therapist and their experience have a major influence on the treatment experience and success in enabling the child to improve and normalise voiding. Addition of pelvic floor training to standard therapy failed to provide any additional benefit in the treatment of nocturnal enuresis.(8)

Plentiful data are now available in support of rigorous pelvic floor training for daytime urinary symptoms in children.(9-13) However, a systematic review and meta-analysis failed to show evidence of effectiveness of biofeedback for daytime voiding disorders in children.(14) The authors comment, however, that available evidence is scarce and not of high quality; only five randomised controlled trials were able to be included, and all had small patient numbers. Well designed, randomized controlled trials with adequate power and objective measurements of outcomes are needed to evaluate the contribution of biofeedback in these children.

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Transcutaneous Electrical Nerve Stimulation (TENS)

Electrical stimulation is an alternative treatment for managing refractory lower urinary tract symptoms (LUTS) in children, particularly overactive bladder (OAB). Two possible mechanisms of action are that:

- Stimulation of afferent sacral nerves in the pelvis or lower extremities increases the inhibitory stimuli to the efferent pelvic nerve and so reduces detrusor contractility, and
- Activation of afferent bladder somatosensors result in increased feedback to the micturition sensors in the brain, as well as activation of the hypogastric sympathetic nerves.

Regardless, there is evidence of changes in the brain, ascending and descending spinal pathways and the bladder sphincters after TENS.(1-4)

TENS is usually offered in treatment resistant enuresis, and though minimally invasive and free of side effects, may involve training by a physiotherapist and is often performed in the home.

While the effects of TENS on LUTS/OAB has been studied more frequently, to date its role had been specifically examined in enuresis in three trials, though one small randomised trial in OAB comparing TENS and urotherapy with sham TENS and urotherapy found that the active TENS group had a significant increase in the percentage of dry nights after 60 days of treatment compared with the sham treatment.(5)

Two randomised trials compared TENS and standard urotherapy with urotherapy alone, in primary monosymptomatic and non-monosymptomatic children, and both found a greater increase in dry nights in the TENS group, though none became fully dry. However a third randomised trial comparing intensive TENS therapy to sham TENS found no difference between the treatment and placebo groups except for a greater increase in maximum voided volume in the TENS group.(6-8)

The reasons for differences in outcomes may be multifactorial, but may in part be due to the lack of a standardised protocol for TENS treatment for enuresis or even LUTS/OAB in children. The positioning of electrodes in children are usually parasacral and described as S2/S3 level, but in one study they were placed over the symphysis pubis & ischial tuberosities. Studies suggests that children need to wear the TENS for at least 30 minutes per day five days per week, and that effective treatment outcomes occur after at least 2 months of treatment. However there is variability in the number and spacing of sessions (from once per week to daily, and from 10 to 140 sessions) and the parameters of the TENS treatments (frequency, pulse, intensity).(5-8)

There may therefore be a role for TENS in children with non-monosymptomatic enuresis. However, the most effective protocol for its use it still to be determined.

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SECTION FOUR



Printable Sheets
for
Parents, Patients
and Practitioners

Bedwetting

Basic Facts for Parents and Carers

Bedwetting is known in medical terms as **nocturnal enuresis** (roughly meaning 'urinate in the night'), and sometimes is just referred to as *enuresis*.

How common is bedwetting?

Bedwetting is common in school age children. It affects:

- 1 in 5 children at 5 years.
- 1 in 10 children at 10 years.
- 1 in 30 to 100 teenagers at 15 to 17 years.

Effects of bedwetting on a child and family

It can be tempting to assume bedwetting is something a child will grow out of in time, or to minimise the problem to try to make the child feel better about it. This does little, however, to lessen its impact on a child's emotional, psychological and social development. There may be strong feelings of shame, guilt and failure, and a sense of being different to others. In some cases bullying and victimisation can result, both in the family and at school. Often bedwetters will avoid social activities that most children take for granted.

Bedwetting doesn't only affect the child concerned; it can be a burden and a source of disturbance, concern and frustration for the entire family. In addition to the emotional costs, there are the financial costs to parents/carers as well as time and effort in cleaning. It can lead to even the best intentioned parents becoming frustrated and intolerant, and relationships suffer.

Are there different types of bedwetting?

For many children, bedwetting is the only problem with wetting they have. This is called

mono-symptomatic enuresis
(meaning 'one symptom' bedwetting).

Some children have other symptoms, such as needing to wee as soon as they feel the urge (urgency), wetting while they're awake, needing to wee more often than usual, or others.

If any other bladder symptoms are present, this is called

non-mono-symptomatic enuresis
(meaning 'not one symptom', that is, more symptoms).

Your doctor will be careful to distinguish between these two, as treatment differs for the two conditions.

What causes bedwetting?

There are three main factors that cause bedwetting. These are:

- Difficulty arousing from sleep.
- Producing more urine during sleep than usual.

- Bladder factors, for instance:
 - a lack of the signal that stops bladder emptying during sleep,
 - a reduced amount the bladder can hold, or
 - bladder overactivity, that is, the muscle that squeezes the bladder to empty it contracts when the bladder isn't full.

However, not all children have all three factors, and the contribution of each varies from one child to another.

Other factors include:

- Family history: bedwetting has long been recognised to cluster in families.
- Some children have snoring and sleep apnoea when they sleep which affects their ability to wake at night to pass urine.
- Children with developmental and other disabilities such as attention deficit/hyperactivity disorder and autistic spectrum disorder have higher rates of bedwetting.

Link with bowel problems

Constipation is common in children with bedwetting (about 25%), and can be a major factor causing the problem. Constipation and other bowel symptoms will need to be addressed by your doctor, and when these are effectively dealt with it is sometimes enough to resolve the bedwetting without further treatment.

How is bedwetting treated?

To begin, it is important to **establish regular drinking and urinating habits**. Drinking well and weeing regularly during the day is important. If the amount the bladder can hold and the urge to wee are causing problems for your child, they need to be treated before other treatment starts.

Treatment is also given for **constipation** or other bowel problems if present.

If the child has **other wetting symptoms** (if they have non-monosymptomatic type), those will be treated first, including any tests that might be needed such as a bladder ultrasound.

If bedwetting is still occurring, **alarm treatment** will generally be offered next (see the information on alarms). Alarm treatment takes longer than medication to get a result (3 to 6 months), but has a lower relapse rate than medication and no side effects on the child's body.

If bedwetting persists after 3 to 6 months of alarm treatment, medication may be considered.

Outlook for becoming dry

- About 1 in 7 children with bedwetting will stop wetting without any treatment or intervention each year.
- Without treatment some children will continue to experience bedwetting through to teenage years, and even to adulthood.
- Treatment helps the majority of children to significantly improve, and most to become dry at night much earlier.

Assessment for Bedwetting

Parent/Carer Information

What will the assessment of the child involve?

The aim of this assessment is to identify what is causing the child's bedwetting problem.

The parent/carer and the child will be interviewed by a health professional and asked lots of questions about the child's bladder, bowel function and bedwetting problem.

Many parents/carers won't know things about their child's bladder or bowel habits, as it isn't a general topic of conversations in most families. Sometimes there may be disagreement between the parent/carer and the child's answers, but remember that the child knows his/her body better than anyone. Some children won't have mentioned daytime problems; they don't see them as abnormal because it is normal for them.

The child's bedwetting problem may be caused by having a bladder that becomes overactive at night or the child may produce too much urine at night. Some children may have both problems. Most children who bed wet are unable to arouse to the sensation of a full bladder, regardless of the cause of the full bladder.

Every child and family deserves a thorough assessment of bedwetting, and this should be done in a sensitive manner. It is important to tell the health professional everything, including how the parent/carer and the child are coping with the wetting. The health professional will understand these issues.

General questions that will be asked are:

- At what age did the child develop daytime control of urine and faeces (wee and poo)?
- When did the child wean from nappies during the day?
- Has bedwetting been a lifelong problem for the child?
- Medical and surgical history (including medications as these can impact on wetting)
- What does the child eat and drink?

Health questions to check for causes of bedwetting and issues that may affect treatment, for example:

- Risk factors for bedwetting, such as sleep apnoea or constipation.
- Daytime bladder symptoms, such as urgency or frequency.
- Questions to determine whether the child's development has been normal.

Family questions are important to check for causes and the best treatments:

- What effect is bedwetting having on the child and family? (This may determine the treatments suitable for the child.)
- How motivated is the child and other family members to treat this problem?
- Are there other family members who had/have wetting or kidney problems?

Physical assessment and other tests:

The health professional will need to exclude physical causes for the bedwetting.

They'll need to examine the child including the genital area, back and abdomen. They'll also test the child's urine with a dipstick to exclude infection and/or other diseases. If there's any reason why the child can't be examined please tell the health professional straight away.

What do the parent/carer and child need to do?

- Ask other family members if anyone had/has urinary or kidney problems.
- Observe the child for about two weeks before the appointment. Note if there is:
 - Urinary urgency or frequent visits to the toilet.
 - Ask the child to listen to their urine stream. Is it a steady stream or does it stop and start?
 - Record dry nights and wet nights. Also, keep a note if the child got up to go to the toilet at night.
 - Chart the child's bowel motions (poos), as constipation is a risk factor for bedwetting.
- Your health professional may also ask you to keep a 3-day frequency volume chart recording all drinks going into the body and all urine coming out of the body. This will include the amount the child is wetting and the number of times he/she gets up to go to the toilet at night. An appropriate chart and instructions will be given by the health professional treating the child.

What rights does a parent/carer or child have during an assessment?

It is the parent's/carer's right to enquire why the health professional needs to ask the questions and to ask about tests that the child may need, such as why the child need the tests, what is involved, what needs to be done for the tests, who will do them and what will the results mean for the child. The parent/carer has the right to refuse a physical examination for the child.

Bladder Management

Parent/Carer Information

What is normal?

Children should go to the toilet to pass urine between 5 - 7 times per day.

For the bladder to work properly, it needs to be relaxed while filling up with urine. Usually, the bladder only contracts (squeezes) when urine is passed. 30% of bedwetting children have overactive bladders at night, so their bladder is contracting even when they don't want it to. This might only happen at night, but for some children it happens in the daytime as well.

Aims of bladder management

- To reduce the episodes of urgency, caused by bladder overactivity or by holding on for too long.
- To normalise the bladder's holding capacity.

Symptoms of an overactive bladder

- Passing urine often during the day (frequency).
- A feeling of "busting" to go to the toilet (urgency).
- "Holding on" behaviour, like squatting or putting their hands on the genital area.
- Occasional daytime wetting.
- A lower than normal amount of urine they can hold in the bladder, for their age.
- Possibly more than one wet episode per night.

A child may experience symptoms of an overactive bladder because they are not drinking enough or because they are constipated. These should be addressed first. If they continue to experience symptoms of an overactive bladder despite drinking well and not being constipated, they need to be assessed by their doctor to see if they need additional treatment.

Important DOs and DON'Ts in bladder management

The child usually has to increase their fluid intake, most of which should be water.

- **Don't** leave all the drinking until after school.
- **Don't** drink large amounts 2 hours before bed.
- **Don't** have caffeine (found in cola, chocolate and fizzy drinks), as it can irritate the bladder and make the child feel busting and want to go to the toilet more often.
- **Do** wee regularly during the day, at least every two to three hours.
- **Do** encourage regular drinks, and reward what the child does.

What is timed voiding?

Timed voiding (weeing) can be used to change a child's bladder habits.

Some children don't go to the toilet often enough and need a schedule to prevent them overstretching their bladder. If your child needs this, your doctor or other health professional will help you work out a schedule for your child to follow.

Bowel Problems and Bedwetting

Constipation is common in children with bedwetting and can be a major factor causing the problem. Even if a child regularly passes bowel motions it is still possible that the bowel is filled with hard, impacted faeces, and this can interfere with the normal functions of the bladder.

What causes constipation?

The most common cause of constipation is regularly holding on when a child needs to pass a bowel motion. This might be because they don't like going to the toilet at school, may be embarrassed to go at a friend's house, lack of opportunity, or not wanting to stop what they're doing. Diet may play a part, with processed, low fibre diets more likely to contribute to constipation than fresh, high fibre diets. Stressful events can play a part, such as family upheaval, a new school or kindergarten, or illness. It might start after they've passed a hard or painful bowel movement, or if they have irritation around the anus. Inadequate fluid intake can lead to hard bowel motions, so it is very important for children to drink water regularly through the day.

What happens to the rectum?

When the bowel motions are held for too long, the rectum reabsorbs the water from them and they become harder and more difficult to pass, which can make a child more reluctant to pass a bowel motion the next time. The hard faeces build up and the rectum is stretched, with a loss of sensation so the child finds it harder to know when they need to pass a motion. Sometimes a child can pass regular bowel motions but hard faeces are still in the rectum and the rectum is still stretched.

What does constipation have to do with bedwetting?

When a child is constipated with a stretched rectum, it can press on the bladder and interfere with the amount of urine it can hold. It can also irritate the bladder, causing it to spasm or empty when it shouldn't. In some cases, when the constipation is treated and normal bowel function is re-established, bedwetting and other symptoms may resolve without the need for other treatment.

Bowel Management

Parent/Carer Information

Aim

The aim of a bowel program is to establish regular bowel motions, which are soft and easy to pass. The child should have 4 or more bowel motions per week.

Instructions

- Bowel activity occurs about 20 minutes after each meal. The child should sit on the toilet and try for a bowel motion at that time. One of the most important times is after breakfast.
- The feet should be well supported with a stool.
- The child should try to relax the pelvic floor muscles (See Tips for Relaxed Voiding in section four).
- The child should sit and try for a few minutes but no more than 5 minutes.
- Always ensure the child wipes his/her bottom properly.
- Tell the child to never ignore the messages the bowel is sending to their brain, if they are able to go to a toilet. When they need to go, they should go or they risk becoming constipated.
- Medications: Your doctor or nurse will tell you if the child needs to take any medications to help with their bowel motions. The medications will make their bowel motions soft, more frequent and easier to pass. Make sure the child takes them as directed.
- The child should drink at least 5 or 6 glasses of fluid per day (water is the best option). Your health professional will inform you of the minimum amount, about 50 mL per kg per day.
- The child should eat fibre in their diet. A variety of fruit, vegetables and cereals such as porridge are good options. A child should aim for 2-3 serves of fruit and 4-5 serves of vegetables daily.

Medications

Medication	Dose	How often should the child take it?	How should it be administered?	Further instructions (e.g. if dose doesn't work, what should family do?)

Bedwetting Alarm

Parent/Carer Information

Alarms are the most successful long-term treatment available for bedwetting, and help about 70% of children who have bedwetting without daytime wetting. Daytime wetting or constipation need to be addressed before alarm training begins.

Children with bedwetting often do well with a bedwetting alarm, but the child must be motivated and will need a great deal of support from all family members. A bedwetting alarm is different from alarm clocks, as it is triggered by the child's wetting, and is not set to a pre-specified time. Alarm training takes a lot of effort from the family as well as the child. If the alarm will be too disruptive for the family (for example, a new baby in the house), it is important to tell the health professional who is treating the child.

About the alarm

- There are two types of alarms:
 - Pad and bell (mat placed on the bed).
 - Body-worn alarm (which fits in the pants).

Both work on exactly the same principle and have similar success rates.

- The alarm will take approximately 6-12 weeks to work, averaging around 8 weeks. It is not unusual to have a slow result in the first weeks.
- The alarm trains the child to respond to a full bladder sensation.
- Initially the alarm will "beep" or vibrate, depending on the type, as urine is passed.
- After a few weeks, the child will wake more quickly until eventually, the child will get up to empty their bladder before the alarm sounds or be able to hold on and sleep right through the night and wake up dry.

The aim

- 14 dry nights in a row is considered a good response.
- 1/3 to 1/2 of children will relapse (wet again) after the alarm therapy is stopped. This relapse rate may be reduced by undertaking the process of "over-learning". (See "Overlearning" on the Alarm in section four).
 - Ask your health professional if the child should trial this process before discontinuing the alarm.
- Frequent follow-up is required.

Alarm Problem Solving

Alarm not going off:

- Battery may be low.
- Child disconnecting alarm.
- Alarm turned off.
- If using pad and bell make sure the child is not wearing underwear/clothing as this may delay the alarm being triggered.

Alarm going off too often:

- Battery may need to be changed.
- Is the child very hot during the night? Remove some blankets or nightclothes.
- The child's bladder size may be too small or they may be making too much urine at night. You'll need to talk to your doctor about this.

Child not responding to alarm:

- Is the child motivated?
- Are the parents/carers providing enough support?
- The parent will need to help the child with waking if initially the child is not waking by themselves to the alarm.
- Does the child have constipation?
- Is the child drinking too much fluid before going to bed?
- Does the child wake and go to the toilet as soon as the alarm goes off? (Lying in bed instead of waking to wee as soon as the alarm goes off can cause the child to not respond).

“Overlearning” on the Alarm

Parent/Carer Information

Children who use the bedwetting alarm have a 30% to 50% chance of wetting the bed again when they stop using the alarm. This is called relapse. To reduce the chance of relapse occurring, some continence centres use a process of “overlearning”.

What is “overlearning”?

When a child is consistently dry at night (14 dry nights in a row), they drink extra fluids before bed and continue to use the alarm. The extra fluids mean more urine is produced during the night, causing the bladder to be overfull so that the child learns to wake up to wee. They continue using the alarm until they are consistently dry by being able to wake to wee during sleep.

Things to know about “overlearning”

- It should not be used if the child is still on desmopressin (MINIRIN®) medication.
- When your child has had 14 dry nights in a row, they must drink between 250-500 mL (or any reasonable amount that would cause the child to wet or wake to void) of fluid (a comfortable amount) in the hour before bed. This should not include anything with caffeine (found in cola or chocolate milk).
- Set the bedwetting alarm as before.
- Don't forget to chart what happens each night.

Three things could happen on these nights

- Your child will sleep all night and not wet the bed, if their bladder can hold the extra fluid. In this situation, you may need to increase the amount of pre-bedtime fluid and continue overlearning.
- Your child will get up to go to the toilet during the night, because the feeling of a full bladder will wake them up. This is a good response.
- Your child will wet the bed. They need to continue overlearning until they can wake to void.

Remember:

- A return to wet nights at the beginning of overlearning is common!
- Make sure your child knows this. Overlearning is like getting into a national team for athletics when you've only competed at your local club before. It can take time and practice to get to the next level.
- Be prepared, and DON'T GET UPSET.
- If it becomes too distressing for the child or if the alarm is triggered too often, you can stop the overlearning.
- When your child has reached 14 dry nights in a row using the overlearning method, the alarm can be removed and the pre-bedtime drink stopped.
- If you need to cease overlearning because of too many wet nights, continue to use the alarm until your child has achieved 14 dry nights again.

Tips for Relaxed Voiding

Instructions for Children

How do the bladder and bowels work?

Inside all of us there is a special muscle that holds our urine, called the bladder.

At the bottom of the bladder there is another muscle, called a sphincter (it's said like 'sfinkta') that works like a gate to hold the urine (wee) inside the bladder. Normally when we wee the sphincter opens and stays open until we're finished.

The same thing happens with your bowel motions (poo). There is a tube, called the intestine, which carries your bowel motions from the inside of your body to the outside. At the end of the tube there are muscles called sphincters. The sphincters stay closed most of the time so that your poo doesn't come out when you don't want it to. The bowel sphincters have to open to let your bowel motion come out, like the bladder ones open when you urinate.

What are pelvic floor muscles?

Another important set of muscles are called your pelvic floor muscles, which lie just under your bladder and bowel. They relax to help your bladder and bowel empty.

Children who haven't learned to relax their pelvic floor muscles while urinating or passing a bowel motion can tend to get urinary tract infections (in the bladder and kidneys), constipation, urgency and kidney reflux (the wee going a little way back up the tubes from the kidneys). Sometimes they may even have loss of bladder or bowel control (wetting and soiling). Learning how to relax the pelvic floor muscles during urinating and bowel motions can help, and avoid long term problems.

How to relax the pelvic floor muscles.

Sitting properly on the toilet when weeing (girls) or having a bowel motion (both girls and boys):

- You must have good foot and leg support when you sit. Use a footstool or something similar. This helps the right muscles to relax.
- Keep knees and feet apart.
- Keep your back straight and tilt slightly forward.

Urinating (weeing) instructions:

- Don't strain.
- Try to make a "jelly belly". Feel the area just above the hip bones and the lower part of the tummy.
- Make sure they move forwards (floppy tummy). Don't suck in the tummy!
- Listen to your wee coming out (the flow). Try to keep the flow going. Try not to let it stop and start but don't push too hard either. Try to draw the shape of the flow in your head. It should resemble a big mountain; the flow starts and slowly gets bigger and then slows down again.
- Continue relaxing your muscles and for up to 5 to 10 seconds after you have finished. This may help with the urine that doesn't want to come out. Whistling and singing can help.

How will I know if I'm getting better?

- If you have fewer urinary tract infections.
- If less urine is left in your bladder when you finish urinating.
- If you have less leakage and less urgency.
- If you do bigger wees, if they were too small before.

Tips for Relaxed Voiding

Instructions for Older Children/Adolescents

How do the bladder and bowels work?

The bladder that holds our urine is a specialised muscle. At the lower end it has another specialised muscle, called a sphincter (pronounced 'sfinkta') that works like a gateway and usually keeps the urine inside until you want to go to the toilet. When we pass urine the sphincter opens and stays open until we've finished, and then it closes again.

The same thing happens with your bowel motions (poo). There is a tube, called the intestine, which carries the waste from what you eat and turns it into poo. At the end of the intestines (also called bowels) there are sphincters. The bowel sphincters stay closed most of the time so you don't poo when you don't want to. When it's time to get rid of the poo, the bowel sphincters have to open to let it out, like the bladder ones open when you urinate.

What are pelvic floor muscles?

Another important set of muscles are called your pelvic floor muscles, which lie just under your bladder and bowel. They relax to help your bladder and bowel empty.

People who haven't learned to relax their pelvic floor muscles while urinating or passing a bowel motion can often get urinary tract infections (in the bladder and kidneys), constipation (where it's difficult to pass bowel motions), urgency (when you feel you have to go and pee immediately as soon as you feel the twinge of having to go) and kidney reflux (the urine going a little way back up the tubes from the kidneys). Sometimes they may even have loss of bladder or bowel control (wetting and soiling). Learning how to relax the pelvic floor muscles during urinating and bowel motions can help, and avoid long term problems.

How to relax the pelvic floor muscles?

Sitting properly on the toilet when urinating (girls) or having a bowel motion (girls and boys):

- You must have good foot and leg support when you sit. Use a footstool or something similar. This helps the right muscles to relax.
- Keep knees and feet apart.
- Keep your back straight and tilt slightly forward.

Urinating instructions:

- Don't strain. Try to make a "jelly belly". Feel the area just above the hip bones and the lower part of the belly.
- Make sure they move forwards (floppy belly). Don't suck in the belly!
- Listen to your urine coming out (the flow). Try to keep the flow going. Try not to let it stop and start but don't push too hard either. Try to draw the shape of the flow in your head. The shape should be like a mountain; the flow starts and slowly gets bigger and then slows down again.
- Continue relaxing your muscles and for up to 5 to 10 seconds after you've finished. This may help with the urine that doesn't want to come out. Whistling and singing can help.

How will I know if I'm getting better?

- If you have fewer urinary tract infections.
- If less urine is left in your bladder when you finish urinating.
- If you have less leakage, less urgency and you do a bigger volume of urine each time.

How to Use the Alarm

Instructions for Children

1. For a bell and pad alarm:
 - Place the alarm on a bedside table and place the mat on the bed. Cover the mat with a sheet. Don't wear any clothing on the bottom half of your body.For a body-worn alarm:
 - Place the sensor part in between two pairs of undies or in a small pad or clip the sensor in your underwear near where you wet, depending on the style of alarm.
2. Always have a "dummy run" before going to bed for the night:
 - Pretend the buzzer has gone off.
 - Try to stop yourself from weeing.
 - Pretend to turn your alarm off.
 - Make your way to the toilet.
 - Empty your bladder for the night.
3. Tell your bladder "I'm going to be dry".
4. When buzzer goes off:
 - Stop yourself from weeing more.
 - Switch off the alarm.
 - Go to the toilet and try to empty your bladder.

As time goes on you should wake up quicker, the wet patch should get smaller and you should do a bigger wee in the toilet. You may start waking before the alarm goes off – if that happens, that is great! Just get up and go to the toilet.

5. Wash and dry yourself and the alarm.
6. Reset the alarm.
7. Write everything down in your Bedwetting Chart.

In the first two weeks your parent/carer may need to help you wake up as soon as the alarm goes off, until you can do it by yourself. It is important for you to wake up and go to the toilet so your brain and body make the connection between the alarm going off and wetting the bed.

Important things to remember

- Drink during the day, at least 5 or 6 drinks. Don't leave all your drinking till the afternoon.
- Don't have caffeine drinks (found in cola or chocolate drinks), after 5.00pm.
- Go to the toilet throughout the day, including recess and lunch.
Don't hold on for too long!
- Try to avoid constipation by drinking lots of water, eating lots of fruits and vegetables and getting plenty of exercise.
- Be positive. "I WILL TRY TO BE DRY!"

How to Use the Alarm

Instructions for Older Children/Adolescents

1. For a bell and pad alarm:
 - Place the alarm on a bedside table and place the mat on the bed. Cover the mat with a sheet. Don't wear any clothing on the bottom half of your body.For a body-worn alarm:
 - Place the sensor part in between two pairs of undies or in a small pad or clip the sensor in your underwear near where you wet, depending on the style of alarm.
2. Always have a "dummy run" before going to bed for the night:
 - Pretend the buzzer has gone off.
 - Try to stop yourself from weeing.
 - Pretend to turn your alarm off.
 - Make your way to the toilet.
 - Empty your bladder for the night.
3. Tell your bladder "I'm going to be dry".
4. When buzzer goes off:
 - Stop yourself from weeing any more.
 - Switch off the alarm.
 - Go to the toilet and try to empty your bladder.

As time goes on you should wake up quicker, the wet patch should get smaller, and you should be urinating a larger and larger amount of urine in the toilet. You may start waking before the alarm goes off – if that happens, that's great! Just get up and go to the toilet.

5. Wash and dry yourself and the alarm.
6. Reset the alarm.
7. Write everything down in your Bedwetting Chart.

In the first two weeks your parent/carer may need to help you wake up as soon as the alarm goes off, until you can do it by yourself. It is important for you to wake up and go to the toilet so your brain and body make the connection between the alarm going off and wetting the bed.

Important things to remember

- Drink during the day, at least 5 or 6 drinks – water is best. Don't leave all your drinking till the afternoon.
- Don't have caffeine drinks (found in cola or chocolate drinks), especially after 5.00pm, as they tend to irritate the bladder and make alarm training and stopping bedwetting more difficult.
- Go to the toilet through the day, including recess and lunch. Don't hold on too long.
- Try to avoid constipation by drinking lots of water, eating lots of fruits and vegetables and getting plenty of exercise.
- Be positive!

Desmopressin (MINIRIN®)

Parent/Carer Information

What is desmopressin? How does it work?

About 2 out every 3 children who wet the bed have reduced amounts of a hormone called *vasopressin*. This hormone acts on the kidneys to produce less volume of more concentrated urine at night while you sleep, so reduced amounts of vasopressin means that the child has more urine, which is relatively dilute.

Desmopressin (MINIRIN®) is a medication which is a synthetic version of vasopressin. It does the same thing as vasopressin in the body, so the kidneys reabsorb more water and produce a lower volume of more concentrated urine. The bladder then only has to cope with a smaller amount of urine while the child is asleep.

Why and when is it prescribed?

It is prescribed for a child so their bladder only has to cope with a smaller amount of urine while asleep.

Normally it is prescribed if the bedwetting alarm hasn't worked well for a child in becoming dry at night, and he/she appears to be producing large amounts of urine while asleep. In some circumstances, which your doctor will explain, the child may receive the medication first. Desmopressin (MINIRIN®) is approved for use in children aged 6 years and over.

How does a child take desmopressin?

Desmopressin (MINIRIN®) is available as;

- Melts (oral lyophilisate) 120 micrograms or 240 micrograms.
- Tablets 200 micrograms.
- Nasal spray 10 micrograms/puff.

They should be taken according to your doctor's instructions. It is taken at bedtime only. They are all effective (usually you can choose which one, although the nasal spray may have more side effects), and it is important that the parent/carers reads the instructions on how to deliver the medication effectively.

How well does it work?

About 7 out of every 10 children who take desmopressin each night for bedwetting will have more dry nights each week. However, it is not a cure.

It is the parent's/carers choice whether the child takes the medication every night or just sometimes when the child and/or the family have a greater need for dry nights. If it is decided that the child should take the medication continuously, then a break of one week from the medication is needed at least every 12 weeks. This break will give the child the opportunity to check whether they have stopped wetting (and therefore no longer need to take the medication) or whether they need to continue taking it.

The medication works best in children who have a reasonable bladder capacity and who produce large amounts of urine at night.

Does it have side effects?

Most children won't have side effects or only mild ones which pass with continued use.

The most significant side effect to be aware of is the possibility of water intoxication, if the child drinks too much. This is a rare side effect, but for that reason it is important that **the child have fluids restricted to no more than one cup (250 mL) from 1 hour before taking the medication until 8 hours after.**

Your doctor will discuss any possible side effects of the medication with you, and further information is available on the medication pack. You should discuss any concerns you have with your doctor. If the child develops any side effects, cease the treatment and seek medical attention.

Oxybutynin

Parent/Carer Information

Oxybutynin (Ditropan®) is a muscle relaxant in a class of drugs called *anticholinergics*. It may be prescribed if a doctor thinks a child has an “overactive bladder”. An overactive bladder may present with symptoms such as going to the toilet frequently (more than 7 times per day), urgency (rushing to the toilet when the child needs to void) and/or daytime wetting. Oxybutynin is usually only prescribed when correct bladder management and other conservative therapy hasn't corrected the problem.

It may be prescribed for bedwetting when there is evidence that the child has bladder overactivity at night, such as wetting more than once a night, or has daytime symptoms of an overactive bladder.

Some facts about oxybutynin

- It can be used in children over the age of 5 years.
- The doctor will specify what dose the child should take and when to take it.
- Each tablet is 5mg, but they can be halved to 2.5mg.
- The child can be prescribed a dose ranging from 2.5mg per day up to 3 full tablets (15mg per day) depending on the extent of the problem and their weight. Never give the child more than the doctor prescribes.

Common side effects of oxybutynin

- Child complaining of being flushed.
- Impaired alertness and vagueness.
- Blurred vision.
- Dry mouth.
- Constipation.
- Loss of bladder sensation and incomplete bladder emptying.

What to do if the child has side effects

- Contact the doctor who prescribed the medication as soon as possible.
- The medication may need to be discontinued if blurred vision, alertness and vagueness become a problem.
- Treat constipation.
- Ensure the health professional checks the child regularly to monitor complete bladder emptying when voiding.

Imipramine

Parent/Carer Information

Imipramine is a medication which is occasionally used in bedwetting. It is from a group of medications called *tricyclic antidepressants*. The exact way that imipramine helps bedwetting isn't certain, but it includes a direct antispasmodic effect on the muscle of the bladder, increasing vasopressin release (which helps the body slow urine production at night) and an effect on the sleep centre of the brain to improve the ability to wake easier.

Imipramine is only used in treatment-resistant enuresis, because it has the potential to have some serious side effects such as arrhythmias (irregularity of the heart beat), lowering of blood pressure, liver problems and impaired alertness. An ECG (electrocardiograph) to check your child's heart and a general medical examination should be done before commencing imipramine, to make sure your child has no conditions that would prevent him/her taking imipramine.

Minor adverse effects are common, especially when first starting imipramine, including dizziness, headache, mood changes and gastrointestinal problems.

Imipramine should not be stopped suddenly, but children need to be "weaned" off imipramine. Relapse of bedwetting after stopping the medication is common. Although they may be effective in reducing enuresis in the short term, they do not have a sustained effect when treatment ceases.

The recommended dosages of imipramine are:

- From 25 mg for six-year-olds (weight 20 to 25 kg) to 50 to 75 mg for those over 11 years. Imipramine should not be given to children under six years of age and the dose should not exceed 75 mg daily.
- The maximum period of treatment should not exceed three months and withdrawal of medication needs to be gradual.

Name:

Frequency/Volume Chart

You must keep a record (day and night) of all the fluid that goes into your body (drinks) and all the fluid that comes out (“wee”) for three (3) separate days (they do not have to be 3 days in a row). You can write things down in the comment section eg. “I was bursting and drops of wee came out on the way to the toilet”.

TIME: Each time you do a “wee” or have a drink, or if you leak a bit of “wee”, you must write it down and the exact time eg. 8.00am – 100 mL.

DRINKS: How much and what did you drink? Try to use millilitres (mL) if you can. Before starting the chart, measure your favourite cup or glass (in mL) and then you will know the measurement each time, eg. 8.00am – 200 mL water.

WEE: When you go to the toilet, measure how much “wee” comes out. Boys can use a measuring jug and girls can use an old ice cream container placed in the toilet (then poured into a measuring jug). Remember to measure if you get up at night-time.








PULL-UPS: For 3 nights, weigh 3 pull-ups (wet and dry). This indicates how much urine is being passed during the night. You must also measure your first “wee” the next morning. What you “wee” into your pull-ups, plus your first morning “wee” indicates the amount of urine your kidney makes overnight.

BOWELS: Use your separate bowel chart. Write in the bowel chart the time and number of your bowel motions for one week.

Example:

Time	Drink	Wee	Comments
8.00am		100 mL	I was bursting and drops of wee came out
8.30am	150 mL milk		

Bristol Stool Chart

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shaped but lumpy
Type 3		Like a sausage but with cracks on the surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clear-cut edges
Type 6		Fluffy pieces with ragged edges, a mushy stool
Type 7		Watery, no solid pieces. Entirely Liquid

Bedwetting Chart

Always record in the morning what happened overnight.

Name:

Date	Wet/dry	Size of wet patch (see below)	Did you wake to 'wee'?	How much 'wee' did you do in the toilet?	Comments

- Size of wet patch:
- Drops = slightly damp
 - Wet = wet through underwear
 - Flooded = soaking through to bed

Star Chart: For Parent/Carer and Child

Always record in the morning what happened overnight. The child should get a star for every dry night.

Name:

Date:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Child's Name:

Date:

Name of person completing questionnaire:

Relationship to child:

Short Screening Instrument in Enuresis

	Please circle YES or NO	
1. Has your child sometimes the feeling that others are reacting negatively?	YES	NO
2. Does your child sometimes feel worthless or less confident?	YES	NO
3. Does your child sometimes have headaches?	YES	NO
4. Does your child sometimes feel sick?	YES	NO
5. Does your child sometimes have abdominal pain?	YES	NO
6. Is your child sometimes little active or lacking energy?	YES	NO
7. Does your child sometimes feel unhappy, sad or depressive?	YES	NO
8. Does your child frequently pay insufficient attention to details or make careless defaults in schoolwork?	YES	NO
9. Does your child frequently have difficulties with organizing tasks and activities?	YES	NO
10. Does your child frequently forget in daily practice?	YES	NO
11. Does your child frequently talk continuously?	YES	NO
12. Is your child frequently busy?	YES	NO
13. Does your child frequently run or climb in situations in which this is inappropriate?	YES	NO

What is Normal?

	Normal	Abnormal
Age of achieving dryness (day and night)	By 3 or 4 years	Wetting after the age of 5
Number of voids per day	4 - 7 dependant on age (less as child gets older)	3 or less per day More than 7
Expected bladder capacity (EBC)	$(30 \text{ mL} \times \text{age}) + 30 \text{ mL}$	Maximum bladder capacity being too small or too large (< 65% or > 130% of EBC respectively)
Urine flow	<p>Description - A continuous stream which reaches a peak and then slows down towards the end.</p> <p>Uroflow should be a bell-shaped curve</p>	<p>Verbal description:</p> <ol style="list-style-type: none"> 1. Stream can slow down and start up again without stopping altogether 2. May completely stop and have to strain to empty 3. Short duration with high pressure 4. Poor flow rate which remains throughout the flow <p>Uroflow:</p> <ol style="list-style-type: none"> 1. Staccato voiding - burst of pelvic floor activities represented by dips in the flow rate 2. Fractionated voiding - incomplete and infrequent voiding with the micturition occurring in several separate attempts. The detrusor is hypoactive with large functional bladder capacity. Abdominal contraction is often used 3. Tower shaped uroflow reading indicates overactive bladder 4. Plateau shaped recording can indicate bladder outlet obstruction
Postvoid residual	NIL	> 20 mL on repeated testing (1-20 mL is borderline and needs consideration)
Bowel function	Type 3 - 4 stool as per Bristol Stool Form Scale at least three or more times per week	Constipation: see Definitions page Faecal incontinence: see Definitions page

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3. Burgers RE, Mugie SM, Chase J, Cooper CS, von Gontard A, Rittig CS, et al. Management of Functional Constipation in Children with Lower Urinary Tract Symptoms: Report from the Standardization Committee of the International Children's Continence Society. *Journal of Urology*. 2013 Jul 1;190(1):29–36.

Age vs expected bladder capacity

- Normal ranges between 65%-150%.
- Nocturnal polyuria is > 130% Expected bladder capacity for age.

Age	Expected bladder capacity for age (mL)	65% EBC too small (mL)	150% EBC too large (mL)	> 130% EBC = nocturnal polyuria (mL)
5	180	< 117	> 270	> 234
6	210	< 137	> 315	> 273
7	240	< 156	> 360	> 312
8	270	< 175	> 405	> 351
9	300	< 195	> 450	> 390
10	330	< 215	> 505	> 429
11	360	< 234	> 540	> 468
12	390	< 253	> 585	> 507

Fluid Requirements

Age (yrs)	mL/kg/day
4	70-80
8	60-70
12	50-60

Fluid requirements depend on temperature and activities undertaken. A daily fluid intake (water, juice, cordial) of approximately 50 mL per kg plus fluids from other sources.

Organisations and Websites dealing with Nocturnal Enuresis

Organisation	Contact Details	Information	Publication Online
Continence Foundation of Australia (Health professionals and the public)	www.continence.org.au National Continence Helpline 1800 33 00 66	<ul style="list-style-type: none"> About CFA Upcoming meetings and Paediatric components Information on children Information on children with special needs Information on funding schemes for aids and appliances 	Call the Helpline for free information and resources
Enuresis Information and Resource Centre (ERIC) (Health professionals and the public)	www.eric.org.uk	<ul style="list-style-type: none"> About ERIC Parent section - downloadable information/ leaflets Health professional section - training opportunities, research, professional forum Membership Web-forum for children News 	<ul style="list-style-type: none"> Information for parents Information for health professionals Children with special needs CDs Standards of practice
Ferring Pharmaceuticals Pty Ltd (Health professionals and the public)	www.treatbedwetting.com.au www.ferring.com.au www.wetalert.com.au	<ul style="list-style-type: none"> Patient information about nocturnal enuresis Patient app Product information Bedwetting alarm 	<ul style="list-style-type: none"> Information for parents Information for health professionals
International Children's Continence Society (ICCS) (Health professionals)	www.i-c-c-s.org	<ul style="list-style-type: none"> About ICCS Events/Meetings Newsletter Membership Members Area Links Page 	<ul style="list-style-type: none"> Standardisation of Lower Urinary Tract Dysfunction in Children Documents from past meetings
International Continence Society (ICS) (Health professionals)	www.ics.org	<ul style="list-style-type: none"> About ICS Upcoming meetings Membership Continence Promotion News 	<ul style="list-style-type: none"> Standardisation of Terminology for Lower Urinary Tract Previous annual meetings abstracts (several on nocturnal enuresis)

Nocturnal Enuresis Assessment Checklist

Identifying the underlying problem

Is the nocturnal enuresis (NE) primary or secondary?

- How often does the NE occur? (Record for 14 nights.)
- In cases of secondary enuresis, what may have contributed to the onset?
- What is the parents'/carer and child's response to wet episodes (motivation to continue treatment)?
- What treatments has the child tried previously? When was it tried, for how long did they use it and what was the treatment response?

Causes of NE

There may be a combination of arousal problems with bladder overactivity and/or nocturnal polyuria.

Arousal problems

- Does the child wake to loud noises?
- Sleep history (children with sleep apnoea have a higher incidence of NE).
- How long does the child sleep?
- Medication (certain medication affects sleep).

Nocturnal polyuria

- Assess night-time urine output (weigh pull-up and add first morning void as soon as they rise for 7 days).
- Assess the child's evening diet and fluid intake.
- Is bedwetting substituted by nocturia on dry nights? How often does this occur?

Nocturnal bladder overactivity

- May have more than one wet episode per night.
- Normal nocturnal urinary output.
- May be part of daytime symptoms (urge, frequency, or incontinence).

Urological symptoms

- What age did the child become dry during the day?
- Ease of toilet training?
- Daytime wetting or daytime symptoms (urgency and frequency).
- Observe voiding dynamics, i.e. the child's voiding posture, how long does it take to void, the urine stream - hesitancy, weak stream, straining, stop and start stream, dribbling when stream finishes.
- UTI history.

Bowel history

- Defaecation dynamics and withholding behaviours.
- Assess for constipation.
- Assess for faecal incontinence.
- Diet (fibre intake).
- Fluid intake and types of fluid.

General history

- Behavioural/developmental issues.
- Family history (including history of nocturnal enuresis, bladder dysfunction).
- Current medications.
- Psychosocial history including family dynamics and effects of bedwetting on the child and parents/carer.
- Sexual history if appropriate.

Physical examination

- Abdominal examination (palpable bladder or faecal mass).
- Neurological examination including deep tendon reflexes for the lower limbs.
- Spinal examination.
- Perineal sensation/anal abnormalities.
- Examination of the genitalia.
- Rectal examination may be required.

Investigations: for all children with NE

- Urinalysis, to assess for UTI, diabetes, hydration and proteinuria.
- Three day frequency volume chart (see printable Frequency/Volume chart).
 - Record time, volumes and type of fluid intake.
 - Record time and amount of urinary output including the child getting up at night.
 - Record time of day and/or night wetting episodes, including predisposing factors e.g. urgency.
 - Note any urgency episodes.
 - Record the amount of urine produced at night (nappy weight and first morning void).
 - Identify whether the child has daytime symptoms e.g. frequency, urgency, short intervals between voids.
- Bowel chart
 - Include the time of day, type and size of bowel movement (see Bristol Stool Chart and Bowel Chart).
 - Note if the child is straining or has pain during defaecation.
 - Note if the child appears to be withholding stool.

- Note if there are any difficulties experienced, e.g. feeling of incomplete emptying, or does the child feel the faeces being sucked back into the anus (e.g. pelvic floor dyssynergia). Does the child need to assist themselves to get the bowel motion out (manual manoeuvres)?
- Record soiling episodes - amount of soiling and how often the child is soiling.
- Record the medications taken for constipation and at what time they were taken.

Further investigations

Uroflow

Urine flow should be continuous and uroflow should be a bell-shaped curve. A uroflow machine will register the flow rate of the void, the volume voided and the time taken to void. It is a very useful tool for children with bladder symptoms and for those who have failed treatment. The child should be instructed to void when they are ready. Volumes under 50 mL are unreliable. Several readings are required.

Postvoid Residual Measurement

Ultrasound or portable bladder scanner used - avoid catheterisation if possible.

The normal bladder should be completely empty in children following a void. Residual urine is the volume remaining in the bladder following completion of micturition. Although it is non-invasive, caution should be taken if a child is anxious about performing the test. Children with vesico ureteric reflux (VUR) may have a small postvoid residual from the refluxing urine re-entering the bladder. The absence of residual urine does not exclude infravesical obstruction. The test should be repeated several times.

Ultrasound/Uroflow/Postvoid Residual Measurement

If children are wetting both during the day and night, then ultrasound imaging of the kidneys and bladder, as well as recording of the uroflow and measurement of postvoid residual volume are added to the assessment. Non-neuropathic bladder/sphincter dysfunction can be diagnosed accurately in up to 80% of cases and a high level of suspicion can be maintained towards both neuropathic bladder dysfunction and structurally-caused incontinence.

Urodynamics

Urodynamic studies (performed by urologists) are necessary when repeated treatment fails or there is suspicion of a neuropathic cause.

Nocturnal Enuresis Clinic Assessment Form

First Visit

Demographic details

Date:

.....

Name:

.....

D.O.B.:

Age:

Sex: Male Female

.....

Parent(s)/carer(s) name:

.....

Address:

.....

Postcode:

.....

Telephone number:

.....

School attended:

Year:

.....

Presenting problem:

Principle problem bedwetting: Yes No

Duration of problem:

.....

Primary NE or Secondary NE

If secondary, relation to any event which may have triggered the bedwetting?

.....

Longest period of night dryness?

.....

When did the child become dry during the day?

.....

When did the child become continent of faeces?

.....

How difficult was the child to toilet train?

.....

Family history of bedwetting: Yes No

.....

Previous treatment: Yes No

- | | | | |
|---|---|--|-------------------------------------|
| <input type="checkbox"/> Reducing fluid | <input type="checkbox"/> Desmopressin | <input type="checkbox"/> Anticholinergics | <input type="checkbox"/> Tricyclics |
| <input type="checkbox"/> Waking | <input type="checkbox"/> Bedwetting alarm | <input type="checkbox"/> Bladder training (describe technique) | |

Other:

.....

Outcome(s)/who prescribed?

.....

Does the child wear protection to bed? Yes No

If yes, type of protection:

.....

Bedwetting: (average over the last three months)

Number of wet episodes:

- | | |
|--|---|
| <input type="checkbox"/> 1-3 times per month | <input type="checkbox"/> More than once per night |
| <input type="checkbox"/> 1-3 times per week | <input type="checkbox"/> Not sure |
| <input type="checkbox"/> 4-7 times per week | |

Amount of leakage:

- | | |
|---|---------------------------------------|
| <input type="checkbox"/> Damp underwear | <input type="checkbox"/> Damp nappy |
| <input type="checkbox"/> Wet through to nightclothes | <input type="checkbox"/> Soaked nappy |
| <input type="checkbox"/> Completely soaked through to bed | |

Usual routine when dealing with wet episodes:

.....

How is the family coping:

.....

What is the child's attitude to the bedwetting?

.....

What made the family seek help?

.....

Sleep history:

Child shares a bedroom: Yes No

If yes, who do they share with?

.....

What time does child go to bed?

.....

What time does he/she fall asleep?

.....

What time does he/she wake in the morning?

.....

Does child get up to the toilet during the night? Never

Sometimes. How often?

≤ 3 times per week

> 3 times per week

How many times per night?

Does the child wake after he/she wets? Yes No

Does the child wake to loud noises? Yes No

Is the child scared to get out of bed in the night? Yes No

Does the child snore? Yes No

Daytime wetting:

Daytime wetting episodes: Yes No

If Yes: Number of daytime wetting episodes: 1-3 times per month

1-3 times per week

4-7 times per week

More than once per day

Not sure

Amount of leakage: Damp underpants

Wet outer clothes

Puddle on the seat or floor

Urgency: Yes No

If yes, how big is this problem? Needs to find a toilet immediately

Can wait a few minutes

Can wait 15 minutes or more

Is the urgency a result of: Quick onset / bladder overactivity

Voiding postponement

If daytime wetting: Awareness of wetting? Yes No

Incontinence whilst laughing? Yes No

Other activities? Yes No

Wetting before or after going to the toilet?

Before After Both Unsure

Urine stream: Good (continuous stream) Stops and starts

Needs to push to empty bladder Yes No

Does child feel he/she empties their bladder? Always Sometimes Never

Dribbling when finished Yes No

Dribbling all the time Yes No

Previous ultrasound scan/report?

Fluid intake:

Number of glasses or mL per day:

Morning

Recess

Lunch

Afternoon

Evening

Night

How much fluid does the child drink after 5 pm? 0

1-2 cups

3-4 cups

More than 4 cups

Caffeine intake after 5 pm: No caffeine

One caffeine drink

Two or more caffeine drinks

Urological symptoms:

How often does the child void during the day? 1-3 times per day

4-7 times per day

More than 7 times per day

Unsure

When does the child void: Wakes up

Before school

Recess

During class

Lunch

Afternoon

Evening

Night

Bowel habits: (use Bowel Chart to confirm)

- How often does child defaecate? At least daily
 Every second day
 Less than every second day
 Once per week or less

Consistency: (according to Bristol Stool Form Scale)

Size of stools:

- Does the child strain to pass stools? Yes No
- Does the child experience pain when they defaecate? Yes No
- Does the child pass blood when they defaecate? Yes No
- Does the child feel they have completely emptied their bowel? Yes No
- Does the child ever feel the stool being sucked back inside or any obstruction? Yes No
- Soiling problems? Yes No

If yes, within the last 6 months, how often?

.....

Dietary history:

.....

Medical history:

.....

Past urinary tract infections: Yes No

If yes, when and how many?

.....

Physical/intellectual disability (specify):

.....

Developmental history:

.....

Behavioural problems:

.....

Surgical history:

.....

Medications:

.....

Allergies:

Immunisation:

.....

Family history:

.....

Social/family history:

.....

Siblings:

Wetting problems:

School year and performance:

Examinations:

Weight: Height: BP: Temperature:

Urinalysis:

Abdominal exam:

Perineal exam (skin problems, urethral meatus):

Neurological exam:

Other:

Management plans:

Further investigations required:

Ultrasound:

MSU:

Comments:

Treatment prescribed: Fluids

Bladder training

Pelvic floor relaxation

Bowel care

Alarm

Desmopressin

Oxybutynin

Other

Nocturnal Enuresis Clinic Assessment Form

Follow-up Visit

Date:

Name:

D.O.B.:

Age:

Sex: Male Female

History and examination:

Number of wet nights per fortnight:

Adverse events reported:

Medication:

Type and amount of drinks:

Frequency of micturition:

Urgency experienced: Yes No

Daytime incontinence: Yes No

Trialling relaxed voiding: Yes No

Urine stream (describe):

Feeling of incomplete bladder emptying: Yes No

Post void dribbling: Yes No

Bowel program:

Bowel function:

Soiling:

Review frequency volume chart:

Daily intake:

Maximum voided volume:

Overnight urine production:

Voids close together: Yes No

Treatment prescribed: Fluids

Bladder training

Pelvic floor relaxation

Bowel care

Alarm

Desmopressin

Oxybutynin

Other

Treatment ceased:

Is family happy to continue with current treatment? Yes No

Is the child compliant? Yes No

Improved

No change

Worse

Summary

Nocturnal Enuresis Clinic Assessment Form

Last Visit

Date:

Name:

D.O.B.:

Age:

Sex: Male Female

Parent's/carer's comments:

1. Has the treatment been helpful in reducing bedwetting?

- Yes, he/she is now completely dry at night and sleeps through
- Yes, he/she is now completely dry at night but gets up to the toilet
- Yes, although he/she still sometimes wets, it is improving

Average number of wet nights per week:

- No, the wetting is the same or worse

Average number of wet nights per week:

2. Describe the child's attitude to the treatment?

- Very happy to follow the program
- Fairly happy to follow the program
- Did not follow the program

3. Were there any side effects from the treatment? Yes No

If yes, please describe:

4. How acceptable was the treatment to the rest of the family?

- Very acceptable to family
- Fairly acceptable to family
- Not very acceptable to family

5. Any further comments?
