Nocturnal Enuresis (‘bedwetting’) in children

Introduction
Bladder and voiding (weeing) problems are common in children. This leaflet specifically focuses on nocturnal enuresis (the medical term for bedwetting) and includes information on:

- how the urinary system works
- causes of nocturnal enuresis in children
- what you can do to help your child
- treatment

A more generalised leaflet is available on bladder and voiding problems in children. Please ask if you would like one or you can download a copy from the Addenbrooke’s website.

At the end of this leaflet you will find contact numbers for use if you have further questions or queries.

What is the urinary system and how does it work?
The bladder, along with the kidneys, ureters and urethra, is a part of the body’s urinary system. Each part of the urinary system has an important job to do:

- The kidneys filter blood to remove waste products and make urine.
- Urine flows from the kidneys to the bladder via the ureters.
- Valves between the ureters and the bladder prevent urine from flowing back up to the kidneys.
- The bladder stores urine and its muscles work to empty the urine out.
- The urethra is the tube through which the urine leaves the bladder and exits the body.

The important muscles that relate to the bladder are; firstly the ‘detrusor muscles’ in the bladder wall and secondly the ‘sphincter’ which is a ring of muscle at the junction of the bladder and urethra which stops urine leaking out between voids (wees).

The bladder is like a balloon inside your body that fills up with, and stores, urine. The bladder should stretch easily as it fills with urine and should not contract or get increased pressure inside as it fills.
The bladder increases in size as your child grows and so, gets an increased capacity and therefore, older children can hold more urine and void less regularly than young children who, because their bladders can hold less, need to void more frequently.

To help understand how the bladder works, imagine you are holding a balloon filled with water; your fingers on one hand hold the neck of the balloon shut and so are acting like the sphincter muscle. Your other hand rests on and around the balloon just like the detrusor muscle. The best way to empty the balloon of water is to relax your fingers holding the neck of the balloon and at the same time, squeeze down with the hand around the balloon itself. Relaxing one hand whilst squeezing with the other takes coordination and this is what the sphincter and detrusor muscles should do when you urinate (‘wee’); the sphincter relaxes at the same time that the detrusor bladder muscle contracts.

**What is nocturnal enuresis?**

Nocturnal enuresis, the medical name for bedwetting, is involuntary wetting during sleep. Because nocturnal enuresis happens during sleep, the child is not conscious of the fact it is happening; it is out of your child’s control and so not their fault.

There are two types of nocturnal enuresis:

Primary nocturnal enuresis: Children with primary nocturnal enuresis have never been consistently dry at night

Secondary nocturnal enuresis: Children who have previously been dry for 6 months or more are described as having secondary nocturnal enuresis.

The assessment and treatments are the same for children with primary or secondary nocturnal enuresis.

**What is considered normal with regards to bladder control?**

What is considered normal depends on your child’s age. When we are babies our bladders fill and empty without our control as a reflex when the bladder is full. As we get older we start to learn to block this reflex; our brains learn that we can control when the bladder contracts and also stop it from contracting and so we become ‘potty trained’. The age at which children gain brain control over their bladders varies and so children differ greatly in how long it takes them to become fully toilet trained. Whilst most children will be dry in the day by the age of 5 years, 1 in 75 children older than five will have some degree of day time wetting.

For all children, night time bladder control takes longer to develop than day time control but again, the age at which children gain night time dryness also varies greatly. In the UK approximately half a million children aged between 5 and 16 wet the bed but the percentage of children decreases with age. For example, it is reported that eight percent of four and a half year olds wet the bed whilst one and a half percent of nine and a half year olds wet the bed and only one percent at adulthood.
What causes nocturnal enuresis in children?

Although we don’t know why some children achieve night time dryness quicker than others, nocturnal enuresis is likely to result from one or a combination of the following factors:

**Not waking to bladder signals**
For some children the signal from the bladder does not wake the child from their sleep. Bedwetting alarms can help to strengthen the signal from the bladder to the brain (see section below on bed wetting alarms)

**Inadequate levels of Vasopressin**
Vasopressin is an ‘anti-diuretic’ hormone which means that it reduces the amount of urine produced by the kidneys. Although vasopressin acts on the kidneys, it is released in the body by the pituitary gland. Vasopressin is released continuously but peak levels occur at night time. If levels of vasopressin are low the kidneys continue to produce large amounts of urine which the bladder cannot hold overnight and so bedwetting results. Levels of vasopressin increase naturally with age but children over the age of five years can be treated with medicine called ‘Desmopressin’ which mimics the natural occurring Vasopressin (see section on ‘treatments’ below).

Children who have low levels of vasopressin are more likely to:
- have large volumes of urine passed at night
- wet in the early part of the night
- wet more than once per night

**Over active bladder**
Overactive bladder is a condition in which the large bladder muscle (the detrusor muscle) contracts involuntarily and so the child experiences frequency, urgency and leakage of urine that can range from a damp patch on underwear to complete emptying of all urine from the bladder. Children with an overactive bladder may have a smaller bladder than is normal for their age.

Involuntary contractions that occur in the daytime can also occur at night during sleep and so result in bedwetting.

Children who have an overactive bladder are more likely to experience the following at night time:
- Damp patches that occur at night also occur during the day
- The volume of urine passed is variable
- Children often wake after wetting at night

**Constipation**
Constipation can make existing nocturnal enuresis worse and can be a cause of secondary nocturnal enuresis:
- Straining to pass stool (‘poo’) can weaken the muscles that support the bladder (the pelvic floor muscles).
- If the bowel is stretched and full with constipated stool it can press against the bladder and result in day and night wetting problems.
It is therefore essential that any constipation is treated as resolving constipation often improves voiding (see section below on treatment).

**Urinary tract infections**
Infection within the urinary tract can cause frequency, urgency and pain on voiding and can exacerbate night time wetting. Infection can be detected with a simple urine test. A specific leaflet on urinary tract infection in children (PIN0210) is available; please ask your child’s nurse or doctor if you would like one.

**Family history**
Bedwetting is more likely if a parent also experienced it. If a child has one parent who wet the bed as a child there is a 45% chance their child will also experience bedwetting. If both parents wet at night as children their child will inherit a 72% chance of wetting the bed (ERIC).

**Anxiety/ stress**
Anxiety, stress or changes in routine (such as changing school, exams, bullying, birth of a new sibling or parental separation) can delay a child becoming dry at night or can cause secondary enuresis. Talking with your child may help identify such causes and, if required, referral to a counsellor or psychologist can be arranged to help support your child.

**What will my child’s assessment involve?**
To identify specific ways to help your child and understand what treatment option will be in their best interests, your child will have an assessment undertaken which will involve you and your child needing to provide some very detailed information to the nurses and doctors and some tests will also be undertaken. A parent or carer can be present for all of the tests.

**Information needed**
The specialist nurses and doctors will ask you and your child lots of questions, including questions about your child’s voiding pattern, their bowel function (frequency of passing a stool or ‘poo’, whether there is any straining and what the stool looks like), how the problems affect your child, the presence of any other problems.

You will be asked to fill in a ‘bladder diary’ which means you will need to write down when your child drinks, what they drink and how much as well as when they wee and how much. You may also be asked to complete a diary which gathers information specific to night time wetting. Instructions on how to fill in the diaries are provided.

It is important that you take your time to accurately document the information in the diaries provided in order that your child’s problem can be accurately assessed and to help direct the most appropriate form of treatment.

**Physical examination**
The specialist nurse or doctor will thoroughly examine the child’s back and genitalia and examine the lower limbs to assess for strength, sensation and reflexes.
Urine tests
Your child will be asked to provide a sample of urine that can be tested in the clinic (called ‘urinalysis’). If there are any abnormal findings on the clinic test, the urine will be sent to the laboratory for more detailed assessment (called microscopy and urine culture).

Bladder scan
A portable bladder scan can be undertaken in the clinic by one of the nurses or doctors; the scan is a type of ultrasound. Gel is placed on your child’s lower abdomen over the bladder and then a transducer (see picture below) is passed over the lower abdomen so any urine in the bladder can be seen. Your child may then be asked to pass urine and the scan repeated so we can assess if the bladder has emptied completely.

Uroflowmetry
Uroflowmetry (also called a ‘flow rate test’) involves passing urine into a machine which has the appearance of a portable toilet. The machine has a computer attached which measures how much urine your child passes and how quickly.
Blood tests
Sometimes blood tests are needed to assess how well the kidneys are working but these are rarely needed when a child’s problems occur at night time only.

Other specialist tests
Depending on the findings of tests mentioned above, renal and bladder ultrasound may be arranged to assess for any obstructions in the urinary system, gain information on the bladder wall thickness and on how well the bladder empties. Ultrasound is not painful. Cold gel is placed onto a probe which is then passed over the child’s kidneys and bladder in the same way that a probe is passed over a pregnant mother’s abdomen. Your child will then be asked to pass urine and then the bladder will be scanned again with the bladder empty.

When your child has nocturnal enuresis but no day time symptoms it is extremely rare for any other specialist tests to be required however, should your child require any other investigations information can be found on these in our leaflet ‘bladder and voiding problems in children’; please ask if you would like a copy.

How can my child help himself/herself to improve and what can I do to help my child improve?

There are many things that you and your child can do to help improve their symptoms.

Motivation, support and patience
It is essential that your child is motivated; co-operation is essential. Secondly, your child requires full support from you and any significant people in their lives. Thirdly, you and your child must be patient; success will not come overnight but instead may take many months of hard work.

To encourage your child and maintain motivation reward agreed behaviour (such as taking the full recommended amount of drinks per day or using the toilet at bedtime) rather than rewarding dry nights.

Drinking
It is extremely important for children to have a good drink intake in order to maintain good health. Drinking enough of the right kinds of drink at the right times can all help to improve nocturnal enuresis.

1) Drinking enough
Children may think that drinking less in the day will help them to stay dry at night but this is not true. Drinking less in the daytime will reduce the size of the bladder and so it will hold less.

How much a child needs to drink will depend on their age, whether they are male or female, the weather, what they have eaten and what physical activities they have been doing; but every child should aim to have six to eight glasses per day.
As a guide:

<table>
<thead>
<tr>
<th>Age</th>
<th>Boys and girls</th>
<th>Girls</th>
<th>Boys</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 to 8 years</td>
<td>1000 to 1400ml</td>
<td>1200 to 2100ml</td>
<td>1400 to 2300ml</td>
</tr>
<tr>
<td>9 to 13 years</td>
<td></td>
<td>1400 to 2500ml</td>
<td>2100 to 3200ml</td>
</tr>
<tr>
<td>14 to 18 years</td>
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</tr>
</tbody>
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2) Drinking regularly

It is better to drink smaller volumes of fluid regularly throughout the day than to have lots in one go. Children should aim to drink:

- on waking
- with breakfast
- where permitted, during lessons
- morning break at school
- with lunch
- on getting home from school
- before the evening meal
- with evening meal

3) Stopping drinks before bed

It is important that the majority of fluid is taken between waking and the child’s evening meal with only a small drink after dinner and no fluids one and a half to two hours before bed. This is especially important in children with bedwetting.

4) Avoiding drinks that can irritate the bladder

Some drinks, such as those that contain caffeine (e.g. tea, coffee, drinking chocolate), are carbonated (fizzy), or contain blackcurrants, should be avoided. Such drinks are diuretics which mean that they cause the kidneys to produce more urine and make you need to go to the toilet more often.

- Regular ‘timed’ toileting:
  It is important that the bladder is filled and emptied regularly during the day. A bladder that is not regularly filled and emptied may have a smaller capacity and so not be able to hold onto all the urine made at night.

Timed toileting means going to the toilet regularly at set times (every two to three hours) rather than only going when the sensation to void is felt. For example:

- on waking
- before leaving the house to go to school
- at morning break
- at lunch break
- on finishing school
- before the evening meal
- after the evening meal
- before going to bed
Children are likely to need encouragement to undertake timed toileting because they are being asked to go to the toilet even though they may not feel they need to.

**Establish a bedtime routine**

1. Provide a calm, relaxed environment before bed because the release of vasopressin is part of the winding down process at night.
   
2. Going to the toilet before bed
   
   o It is essential that your child’s routine includes going to the toilet as part of getting ready to bed and also going again immediately before settling down to sleep. Your child may be cozy and not want to get out of bed again after reading or hearing a story but using the toilet again immediately before lying down to sleep will ensure the bladder is completely empty.

3. Ensure your child’s bedroom is dark. Release of vasopressin is part of the winding down process at night and the change in light helps this process. Sleeping in a darkened room and without the television on is therefore important.

4. Make it easy for your child to get to the toilet overnight.
   
   o Ensure your child has a night light that they can turn on if they wake in the night needing to use the toilet.
   
   o Ensure your child can get of bed with ease for example, by them sleeping on the bottom bed of bunk beds.

5. Motivate your child at bedtime by, for example, encouraging them to say “I will be dry tonight” rather than saying “I hope I don’t wet myself again tonight”.
   
   Also remind your child that if they wake in the night they should go to the toilet before settling back off to sleep again.

**Refrain from using nappies or pull ups at night**
The design of, particularly disposable, nappies and pull ups means that urine is very quickly absorbed into the layers and away from the child’s skin. In a sleeping child this can mean that they miss the signal that their bladder is emptying. Children without nappies and pull ups are more likely to sense that they are wetting and so learn to contract their pelvic floor muscles in response to being wet, to interrupt the flow of urine and to wake up to use the toilet.

Using protective covers for mattresses, duvets and pillows is thus beneficial and using disposable protective sheets can make any night time sheet changes easier and quicker.

**Waking/ lifting**

Some parents carry their child to the toilet at night, something referred to as ‘lifting’. Lifting may be useful in younger children when they start to become dry overnight. However, to become dry at night children need to learn to wake to the signal of their full bladder; lifting over a long period of time may conversely teach them to void (wee) in their sleep and cause the child to become dependent on their parent to ensure they are dry at night.
Lifting may be used to manage bedwetting in the short term in which case the following steps should be followed:

- ensure your child is fully awake and aware of why they are being woken
- walk your child to the toilet at a different time each night

Older children who have continued bedwetting despite following all advice and trying different treatments may find self-instigated waking helpful for example, setting an alarm clock or alarm on their phone, as a strategy for managing bedwetting.

**Prevent and treat constipation**

Constipation can affect how your child voids and straining to pass stool (‘poo’) can weaken the muscles that support the bladder (the pelvic floor muscles). It is therefore essential that any constipation is treated, as resolving constipation often improves voiding.

- Drinking plenty helps to keep stools soft.
- Ensure your child eats a healthy diet with a wide range of fruit and vegetables.
- Some people find that introducing probiotic drinks or yoghurts help avoid constipation. There is some evidence that they can also change the bacteria in the stool and so may help to prevent urinary infections.
- Laxative medication can be given to children but, given only after talking with a nurse, doctor or pharmacist as children require different doses to adults.

**Treat urinary tract infections**

If your child is diagnosed with a urinary tract infection (UTI) they will be given a course of antibiotics to treat it. It is very important that your child takes all medication as advised and completes the course of treatment.

It is a good idea to make a record of when your child had a UTI, what the bacteria was that caused it, the name of the antibiotic that treated the infection and how well it worked, so that if your child gets other infections this information can be given to your child’s doctor or nurse.

An information leaflet specific to urinary tract infection in children (PIN0210) is available; if you would like a copy please ask your nurse or doctor.

**What treatments are available?**

**Treatments for urine infections and constipation:**

**Antibiotics**

Antibiotics are only used when your child’s bladder or voiding problems are due to infection.

**Laxatives**

Laxatives are medicines which treat constipation; some help to soften the stool, others stimulate the bowel movement and others do both.
Treatments used for nocturnal enuresis:

Alarms – mattress and body worn

The aims of alarm treatment for bedwetting are to train the child or young person to recognise the need to pass urine and to wake to go to the toilet. Two types of alarm are available; the bed-mat alarm and the body worn alarm. Both types work in the same way, that is, a sensor detects when a child has started to wet and this triggers an alarm (audible or vibrating) to wake and alert the child. Over time children learn to link the sensation of having a full bladder with the need to wake up and go to the toilet and will then start to wake before the alarm goes off.

In some areas alarm systems can be loaned but in others purchase by the family may be required. Your nurse or doctor will be able to advise you on how an alarm system can be made available for your child.

Use of an alarm as a treatment for nocturnal enuresis has a high long term success rate but:

- Require a highly motivated child who is willing to work with the alarm and a supportive family because use of an alarm does require sustained involvement, commitment and effort.
- Using an alarm can disrupt sleep.
- Parents/ carers may need to help the child or young person to wake to the alarm.
- You will need to record progress (for example, if and when the child or young person wakes and how wet they are).
- Alarms are not suitable for all children (for example, less suitable for children who wet less than one to two times per week).

To help maintain the sustained effort needed and to help achieve success with alarm treatment:

- Use positive rewards at the same time as alarm treatment. Reward your child for waking up when the alarm goes off, for going to the toilet after the alarm has gone off and for returning to bed and resetting the alarm.
- Discuss and agree on your and your child’s responsibilities for using the alarm before you start.
- Make sure you understand how to use the alarm and the commitment required. Your health care team will provide you with information on using the alarm and leaflets are also available on the ERIC website (see reference section at the end of this leaflet). If you do not feel that you have the time needed to commit to using the alarm now discuss this with your child’s nurse or doctor so alarm treatment can be started when you have more time or, alternative treatments discussed.

It may take a few weeks for early signs of a response to the alarm to occur. Early signs to look out for are:

- smaller wet patches
- waking to the alarm
- the alarm going off later and fewer times per night
- fewer wet nights
Dry nights are a late sign of response to the alarm and may take many weeks to achieve. Your child’s progress will be monitored by health professionals who specialise in treatments for nocturnal enuresis and usually, if dry nights have not been achieved three months after using the alarm other treatments/combinations will be discussed.

Once your child has had a minimum of 14 consecutive dry nights you can stop using the alarm. If bedwetting starts again you can restart using the alarm immediately without having to first consult with your nurse or doctor and continue to use the alarm until there have been a further 14 consecutive dry nights.

**Medications:**
Medications are most effective when children are drinking enough, drinking regularly and using the toilet regularly as described in section headed ‘what can I do to help my child improve’.

**Desmopressin**
Desmopressin is an artificial form of the naturally occurring hormone called vasopressin and works in a similar way to decrease and concentrate urine produced at night. Desmopressin is available on prescription for children over the age of five years in the form of a tablet or as a ‘melt’ which dissolves under the tongue. There are a number of important points and ‘rules’ to remember about desmopressin:

**Important points:**
- Desmopressin does not stimulate the production of vasopressin and so when a child stops using desmopressin they may start to wet the bed again if their own vasopressin levels are still low.
- Production of vasopressin is part of a child’s individual development and some produce it at a later age than others.
- Desmopressin is usually taken for three months and then stopped for one week to ascertain whether the child now has a sufficient level of their own natural vasopressin.
- The dose of desmopressin can be increased if necessary after discussion with your child’s nurse or doctor.
- Desmopressin does not work for all children. Desmopressin is fully effective for about one third of children, partly effective for about one third of children and in another third of children it has no effect.
- Desmopressin may be taken for occasional use only, for example, on nights away from home. Because desmopressin does not work for all children a trial run is recommended beforehand.
- Children often take desmopressin in the form of ‘Desmomelt’; a tablet which, rather than being swallowed, is placed under the tongue shortly before bedtime as this prevents the need for a drink to help swallow a traditional tablet.
- Side-effects of desmopressin are rare. Possible side-effects may include headache, feeling sick and mild tummy pain. These side-effects are not serious and go away if the treatment is stopped.
To prevent side-effects it is important that children take only very small drinks for one hour before taking the medication and for eight hours after (see ‘rules’ below). Full details about contraindications and side-effects are available in the product literature.

‘Rules’
- Children must not drink more than sips for one hour before taking the medication and until eight hours after taking it.
- Children who are experiencing vomiting or diarrhoea must not take desmopressin until their symptoms have cleared.

Anticholinergic medications
These medications relax the detrusor muscle that surrounds the bladder and can decrease involuntary bladder contractions and so help to enable the bladder to relax and hold more urine. The names of the two anticholinergic medicines commonly used for children are:
- oxybutynin
- tolterodine

In children with nocturnal enuresis anticholinergic medication is used in combination with desmopressin.

Details about contraindications and side-effects are available in the product literature. Please discuss any queries or concerns you have with your child’s nurse or doctor.

What if treatments don’t work?
- Success is classified as 14 consecutive dry nights.
- Any treatment offered needs to be tried for a reasonable time before it is considered unsuccessful.
- Recording signs of progress on a chart can be helpful.
- Using alarms: If bedwetting starts again after a bedwetting alarm has previously been successful, recommence using the alarm again until there have been 14 more consecutive dry nights.

- Taking desmopressin: The dose of desmopressin may need to be increased after two to four weeks if your child is not dry. Dose changes should only be made after communication with your child’s nurse or doctor. For children for whom desmopressin works, re-assessment, via trial off medication, is needed every three months (see above).
- Taking oxybutynin: The full effectiveness of oxybutynin takes weeks to build up and so reassessment will usually be between three and six months after your child starts to take it.
- When one treatment is considered unsuccessful an alternative, or combination of treatments, may be offered.
### Summary
- Nocturnal enuresis is out of your child’s control – it is not your child’s fault.
- Night time bladder control is gained at different ages in different children.
- Simple measures such as drinking enough, drinking the majority of fluid before 16:00 and stopping drinks at least one hour before bed, having a regular voiding pattern and avoiding use of nappies/pull-ups at night are all important in managing nocturnal enuresis.
- Treatments may include alarms, medication or a combination of these.
- Managing nocturnal enuresis requires sustained involvement, commitment and effort from your child and from you as their parent/carer.
- Rewarding your child for their efforts is essential.

### Who shall I contact if I have any queries, concerns or questions?
For further information/queries please contact:

Your nurse specialist (Mon to Fri 08:00 to 18:00hrs) 01223 586973
The ward/clinic you were on________________________________________

References:
- The Education and Resources for Improving Childhood Continence Website [www.eric.org.uk](http://www.eric.org.uk)
- ERIC’s booklets ‘Your Childs Alarm’ and ‘You and Your Alarm’ (for children).
We are now a smoke-free site: smoking will not be allowed anywhere on the hospital site. For advice and support in quitting, contact your GP or the free NHS stop smoking helpline on 0800 169 0169.

Other formats:

If you would like this information in another language, large print or audio, please ask the department where you are being treated, to contact the patient information team: patient.information@addenbrookes.nhs.uk.

Please note: We do not currently hold many leaflets in other languages; written translation requests are funded and agreed by the department who has authored the leaflet.

Document history
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