



Case Management

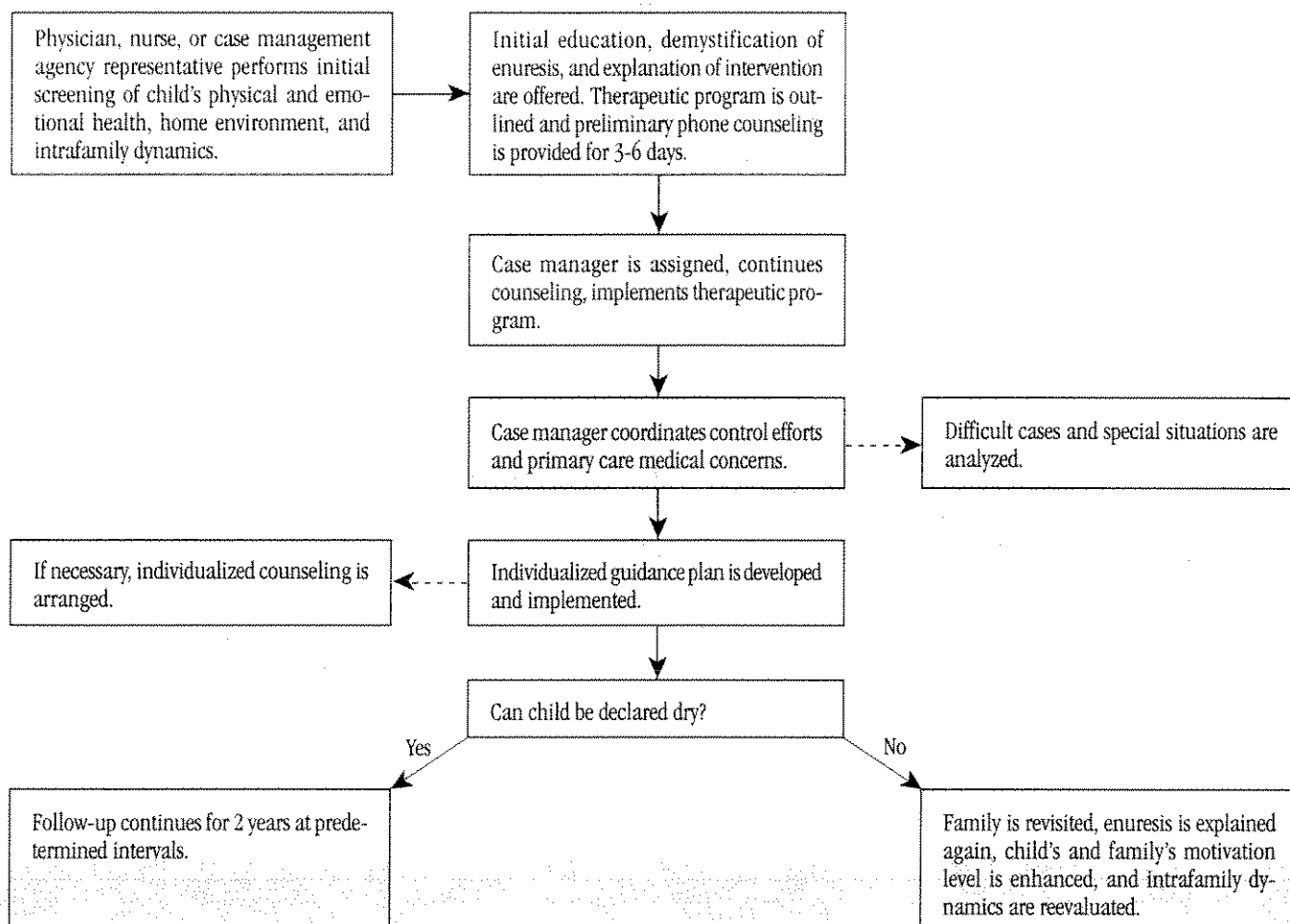


Figure 3. The case management approach, which involves individualizing therapy and combining educational and behavior modification techniques, helps the primary care clinician achieve effective control of PNE through home visits, analysis of recalcitrant cases, close monitoring of personal and family dynamics, and long-term follow-up. A sample algorithm for case management is shown, but others may be appropriate. An agency that provides case management should offer a multifaceted program that can intervene in whatever specific way the child needs to attain nighttime control of PNE.

effective and may be detrimental outside the context of a multifaceted educational program designed to alter behavior.

Pharmacologic Treatments

Three drugs are used in the treatment of PNE (Table 2). Two, imipramine and desmopressin acetate, offer effective short- to medium-term management of PNE. Both work best on an as-needed basis. A third, oxybutynin chloride, is used only when daytime urgency or wetting occurs.

Imipramine has been associated with potentially severe—even lethal—cardiovascular adverse effects, symposium faculty members warn, and desmopressin is expensive. Another drawback of both imipramine and desmopressin is a high relapse rate upon withdrawal of the drug. On the other hand, both can get a child dry quickly and thereby interrupt the cycle of bed-wetting and deteriorating intrafamily dynamics and psychosocial functionality. In certain families and situations, this intercession may provide just the break a child needs to achieve

Table 2—Pharmacotherapy for PNE*

Drug	Dosage	Taper	Caveats and comments
Imipramine	Age 6-8: 25 mg/d hs > age 8: 50-75 mg/d hs	By 25 mg q2wk	Safety is a primary concern; overdose can be fatal (signs include ventricular tachycardia, seizures, coma); patient education on safe use is essential for child and family.
Desmopressin	20 µg (1 10 µg spray/nostril) hs; children with recalcitrant enuresis may receive 40 µg (2 10 µg sprays/nostril) hs	1 spray (10 µg)/d	Child should reduce nighttime fluid intake to prevent hyponatremia; recommended for occasional short-term use.
Oxybutynin	5 mg bid or tid	—	Reserved for children with daytime enuresis or urgency.

*Based on recommendations by the symposium faculty.

the normal developmental step of becoming dry.

Imipramine Safety is the primary concern when imipramine is used to treat children with PNE. It is essential that parents and children be carefully and repeatedly instructed on the safe handling of imipramine. Some physicians refuse to consider imipramine as a treatment for PNE; others sanction its use but urge caution. A consensus would state that imipramine has a place in PNE treatment only if used sparingly and cautiously: Put imipramine on reserve as a treatment to be used only after giving safer behavioral approaches a trial of at least several months. The drug is not approved by the US Food and Drug Administration (FDA) for use in children younger than 6 years.

Imipramine is the most well-studied tricyclic antidepressant tested in PNE management. It works centrally and peripherally through a combination of anticholinergic and noradrenergic effects that increase bladder capacity and decrease detrusor muscle excitability.^{3,9}

While the overall cure rate associated with imipramine therapy is reported to be only 25%, initial response rates exceed 50%, and the drug may work well enough temporarily to justify its application as a stopgap measure to reduce family stress and to keep a child dry long enough to develop nocturnal urinary control normally.^{3,5} Combined with family counseling and either casual or formal psychological support, imipramine can

achieve a high success rate in the hands of some physicians. It may, however, alter sleep patterns.

A commonly recommended dose is 25 mg nightly for children 6 to 8 years old and 50 to 75 mg for older children and adolescents.⁵ When the drug works, its efficacy is apparent during the first week of treatment. Duration of therapy is usually 6 to 9 months, with a slow taper to discontinue the drug. Potential side effects include daytime drowsiness, tachycardia, blurred vision, flushing, hyperactivity, and behavioral changes, but these are not frequently encountered at low doses.³

The most serious obstacle to recommending imipramine use is the potential for overdose. Deaths have been reported with its use in children. More than 22 fatalities occurred in a 4-year period, according to one study.³ In the view of many clinicians, few drugs are as toxic or potentially lethal even in low doses, and, in Great Britain, imipramine is among the most frequently cited causes of poisoning in children younger than 5 years.⁹ Signs of overdose include ventricular tachycardia, coma, and seizures.^{3,9}

Desmopressin acetate Desmopressin produces quick results with negligible side effects, but it is expensive and is associated with a high relapse rate.^{3,5,13} Desmopressin is a synthetic analogue of ADH, and its use in PNE is based on the observation that some enuretic children lack the normal nocturnal rise in ADH production. The drug re-

duces urine production, avoiding a full bladder at night.

Desmopressin is administered as a nasal spray, given within 2 hours before bedtime. In some studies, desmopressin has produced a response rate of up to 70% with a dosage of 20 µg, or one spray containing 10 µg in each nostril.^{3,5,9} Many studies, however, report lower success rates, and most also note relapse rates of between 60% and 100%.³ In the absence of response, the dosage may be increased to 20 µg per nostril per night (40-µg total), in weekly increments of 10 µg. Higher doses should be tapered to 10 µg per nostril per night as soon as feasible.^{5,9}

Side effects include epistaxis, transient headache, and, in isolated cases, hyponatremic seizures, but a review of numerous studies involving thousands of children in both the United States and Europe showed a favorable safety profile.^{3,5,14-16} Parents should be cautioned to reduce evening fluid intake while the child is taking desmopressin to lessen the chance of hyponatremia.

Desmopressin can be immediately successful, making it useful for specific instances when a child needs to remain dry for a few nights, such as at summer camp, on an overnight sports trip, or during a sleepover visit to a friend or relative. The high relapse rate on cessation of the drug and high cost, however, tend to relegate desmopressin to only occasional and selective use.

Oxybutynin chloride Anticholinergic drugs have a role in reducing uninhibited bladder contractions and increasing bladder capacity.^{3,5} Oxybutynin is an anticholinergic and antispasmodic agent sometimes used as a last resort for enuresis control, but it should be reserved for cases associated with daytime urgency or frequency.⁸ Side effects include constipation (sometimes a cause of nocturnal enuresis), tremor, vasomotor facial flushing, hyperpyrexia and other manifestations of heat stroke (due to decreased ability to sweat), and blurred vision.^{3,5}

The dosage for most children is two 5-mg tablets daily (or 0.1 mg/kg tid); occasionally, three 5-mg tablets may be given. Because of the paucity of clinical data, the drug is not approved by the FDA for use in children younger than 5 years.

Nonpharmacologic treatments

Approaches that do not rely on medications to control enuresis place the physician or other health care profes-

Table 3—Components of Nonpharmacologic Therapy for PNE

Education for child and family
Demystification of enuresis
Behavior or conditioning therapy
Bed-wetting alarm use
Motivational counseling
Nighttime fluid intake control
Daytime urination postponement
Nocturnal self-awakening
Reinforcement
Relaxation techniques/imagery/hypnosis
Sharing responsibility for morning cleanup
Individualized case management
Elimination diets

sional squarely in the dual role of educator and counselor.¹⁷ Nonpharmacologic treatments usually form a cluster of therapies often used together, tailored to a child's specific situation, to produce a more effective strategy for enuresis control than any one therapy alone (Table 3).¹⁷ Some, such as supportive counseling for the family and child, are part of every primary care physician's repertoire. Others, such as hypnotherapy techniques, may depend on availability of local therapists or the clinician's skills in hypnosis.¹⁸ Most primary care physicians, however, can readily use some imagery, suggestion, and relaxation techniques after brief training (see "Hypnotherapy: Why Not Use Imagery and Relaxation in Primary Care?" page 29).¹⁹

Efficacy of nonpharmacologic approaches Contemporary thinking about nonpharmacologic therapy centers on behavior modification through a multifaceted approach that includes education, demystification, use of bed-wetting alarms, and counseling. This combination is widely regarded as the gold standard in therapy for PNE.³ Although this therapeutic model has a 30-year history of safety and efficacy (alarms were introduced in 1948), it is used by only a minority of primary care physicians.³

Nonpharmacologic therapy provides the highest long-term cure rate (see "Educational Approaches to Behavior Modification," page 32).^{7,9,20} By combining motivational counseling, behavior modification, use of a bed-wetting alarm and relaxation-imagery, a primary care phy-

sician can control PNE in 70% to 80% of patients. With individualized case management involving home visits, the success rate may climb to above 90%. This may be seen after only a few months of therapy. Even the child who voids infrequently may benefit more from a timed voiding schedule and psychological approaches based on behavior modification than from medication.¹²

The rate of recidivism may be significant when the case management intervention ceases. Relapse rates of 30% to 40% are not uncommon.³ When relapse occurs, a second attempt to achieve control may be made within a few weeks. This often enables more than 90% of children who have relapsed to attain control.

For the child who makes good progress toward nighttime control but does not get "all the way dry" after a first course of nonpharmacologic therapy in primary care, it is reasonable to wait 6 to 12 months before attempting to re-treat. This is only an option, of course, if the education and behavior modification already employed have reduced anxiety and tension to the point where the child and family are more accepting of the situation. Then, waiting 6 months to a year for the child to mature before reinstituting a therapeutic program can result in a higher likelihood of cure. Children 7 to 8 years old may respond better than those age 6 or younger because of their more advanced understanding of the process of bladder control and increased autonomic nervous system maturity.

Practical implementation of nonpharmacologic enuresis control in primary care Treatment begins with the first office or clinic visit, during which the clinician can give support to parents. This includes explicit statements intended to relieve unfounded fears that PNE is abnormal or represents conscious or malicious "acting out" against them. The clinician can also help break the cycle of blame that becomes established between parents and child or between one parent and the other.

The primary care physician can demystify PNE through simple and clear explanations and drawings, and can provide hope to the family that PNE can be treated successfully with complete safety. These messages should be targeted at parent and child alike. Therapy continues with the establishment of a system for monitoring and rewarding success—such as stars on a calendar—to reinforce the training objective: dry nights. It's important also

to delegate some responsibility to the child for the work incurred by enuresis, such as collecting and helping to launder the wet sheets. Punishment should not be the objective of this, however, and is never an aspect of treatment. Enuresis itself, with its attendant denigration of self-esteem and constellation of psychosocial and family problems, provides more than enough negativity for a child to bear. In fact, the recent discovery that a gene has been linked to persistent bed-wetting in some children should lay to rest the perception that an enuretic child should in any way be the target of blame or culpability in all but rare cases.²¹

The enuresis alarm is a key element in behavior modification, but it is not intended to be used alone (Table 4). The symposium faculty recommends that the alarm be viewed as a tool within a comprehensive program to monitor bed-wetting activity rather than as a therapeutic instrument in its own right. The roles of the alarm are to establish the baseline pattern of bed-wetting objectively, enable the parents to intervene, and allow objective monitoring of bed-wetting as the treatment program proceeds. The majority of children with PNE will sleep through the alarm if no other component of education or behavior modification is used. Typically, the alarm wakes the parents, who then awaken the child and implement the appropriate components of the treatment program.

When a bed-wetting alarm is used alone—without a comprehensive behavioral program—the relapse rate may be significant. Two kinds of safe and effective alarms are available, each of which is relatively inexpensive at under \$60. The traditional older type of alarm consists of two conductive screens separated by a towel. These older alarms have been largely replaced by newer types of alarms that are worn on the body.^{9,22}

In nonpharmacologic regimens, a significant commitment to high-quality care, which may involve time and personal effort, is required by the physician, the case manager (if utilized), and the parents. Parental education is the sine qua non for success. Parents need to understand that they are to wake the child completely when the enuresis alarm goes off and must take him or her to the bathroom. Goals of a "becoming dry program" include achieving a specified number of dry nights during the first month of treatment and gradually increasing the "dry

Table 4—Getting the Most From a Bed-wetting Alarm

Note: A bed-wetting alarm should be used within the context of a comprehensive approach to enuresis control that provides demystification, education, counseling, and behavior modification.

Tell the child:

1. Respond to the alarm quickly.
2. Connect and test the alarm yourself.
3. Use a nightlight or keep a flashlight handy at night.
4. Try to wake up before the alarm sounds.
5. Stand immediately and hurry to the bathroom when the alarm sounds.
6. Cover the wet spot on the bed and put on dry pajamas.
7. Go back to sleep, reminding yourself to respond to the alarm immediately.

Tell the parent:

1. Help your child awaken as quickly as possible.
 2. Lead your child to the bathroom and see that he or she is fully awake at the toilet.
 3. Make sure your child doesn't go to bed too late.
 4. Track all data about the bed-wetting episode according to instructions from the physician or case manager.
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night quota" for the next several successive months.

Achievement of more "dry beds" over time deserves to be celebrated. Using a hypnotherapy-based approach, the physician can suggest that the child imagine he is asleep in his bed. When the child is relaxed and comfortable with his imagery, a suggestion can be made that the child imagine feeling the urge to urinate but to then "see" himself getting up from the bed and walking to the toilet, followed by urinating in the toilet. Alternatively, the child can be asked to imagine keeping the urine inside his bladder comfortably all night. The child can complete the imagery exercise by experiencing how good it feels to be dry all night (see "Hypnotherapy: Why Not Use Imagery and Relaxation in Primary Care?" page 29).

Because combined treatment programs require continuous and consistent follow-up, some experts suggest that families with enuretic children be referred to agencies that provide a full spectrum of education and individualized case management for the child and family plus the panoply of behavior modification and motivational counseling techniques that can fit any family and clinical

situation (see "Enuresis Control Through Case Management," page 34, and "Reasonable Expectations and a Time Line for Home Care," page 35). Such agencies can provide age-appropriate education about enuresis for the child, remove issues of blame and guilt from the intrafamily dynamic, provide the alarm, ensure correct instruction in its use, and enable the child and the family to obtain whatever additional education on PNE is necessary. They are also equipped to offer individualized case management and long-term follow-up.

The cost for such services through a specialized outside agency is about \$1,500. In contrast, the primary care physician can—by devoting effort and time—reduce the cost of a dry beds program to about \$400 (assuming four follow-up visits) through the use of age-appropriate explanations, hypnotherapy-based techniques, counseling, and other behavioral approaches. (This estimated cost is exclusive of the physician's phone call management time.)

Many insurance plans reimburse expenses and managed care organizations include coverage for enuresis control programs, sometimes including the cost of any necessary alarms, home care, and case management. The chance of partial or complete reimbursement is greatest when the program or its individual components are prescribed specifically by the primary care physician. In some insurance or managed care plans, the likelihood of coverage is increased further when the primary care physician remains close to the program, either through hands-on management or regular updates from the service that provides the care.

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COUNTERPOINT & COMMENTARY

The multidisciplinary faculty of the symposium tackles some of the controversial aspects of diagnosing and treating children who have primary nocturnal enuresis.

When to evaluate an enuretic child...

Dr. Jacobs: Is there a lower limit of age for which this faculty agrees that a child needs to be evaluated for enuresis?

Dr. Golbin: We have to differentiate between the physiologic age at which a child is capable of bladder control and the age at which society perceives wetting is a problem. This determination is culturally biased. In the United States, age 5 is probably a reasonable cut-off; that is the age at which many children enter school or day care, even though the neuromuscular capability for control exists long before that time.

Dr. Saltzman: For many of us in primary care pediatrics, the age to begin routine questioning about toilet habits is usually 3 years, though voiding histories are routinely obtained from early infancy. If the child is not dry during the daytime at that age, then he or she cannot attend nursery school.

Dr. Kogan: This is a crucial issue. If the child has PNE, there may be no age at which intervention is necessary on a strictly medical basis. When to evaluate and treat a child depends not only on cultural factors but on the individual family. Families have brought 3-year-old children to me and demanded that something be done about their wetting, and I have also been involved with families of 12-year-old enuretics who were not at all concerned, at least overtly. When the family is not interested in controlling the bed-wetting, there is little point in attempting to treat the child. If you raise the issue, parents may become in-



involved, but without adequate concern on their part, the follow-through is poor.

The need to distinguish between primary and secondary enuresis...

Dr. Faber: In real-world medicine, how much evaluation is necessary? In my experience it is not always necessary to distinguish between primary and secondary enuresis

for effective control.

Dr. Golbin: True. The differentiation between primary and secondary enuresis is neither practical nor reliable. Sometimes, when you question parents who claim that a dry child has begun wetting, you learn that the child was not truly dry in the first place, so the new wetting is not really secondary.

Dr. Jacobs: Parental education is essential, and the need for it can be reflected in surprising ways. For example, I have in my practice a 4-year-old girl who is both obese and enuretic. Her mother was more concerned about her rapid weight gain than about her wetting. When I took the history, I was amazed to learn that the child drank a six-pack of 16-ounce sodas—complete with sugar and caffeine—each day after school. Her mother had no idea that this could be the cause of the problem. When the child stopped drinking so much soda, though, she stopped wetting and lost weight.

The need to treat...

Dr. Jacobs: When is therapy necessary in PNE?

Dr. Saltzman: The need for intervention is based on intrafamily dynamics and the child's psyche. The major reasons boil down, one way or another, to the health of the child's ego, the child's motivation, the social acceptance or rejection of the wet child, school-related imperatives, the stability of the family's marriage, and the ability of the family and the child to tolerate stresses incurred by constant wetting in addition to the stresses of daily life.

Dr. Golbin: For some children, bed-wetting is a compensatory mechanism that is necessary for healthy sleep. In some cases, enuresis may be linked to other parasomnias and more serious medical conditions. Therefore, the decision to treat has to take into account the degree to which enuresis is a problem for the child alone and for the family as a unit. If enuresis is perceived as a problem—for whatever reason—evaluation and treatment should be initiated.

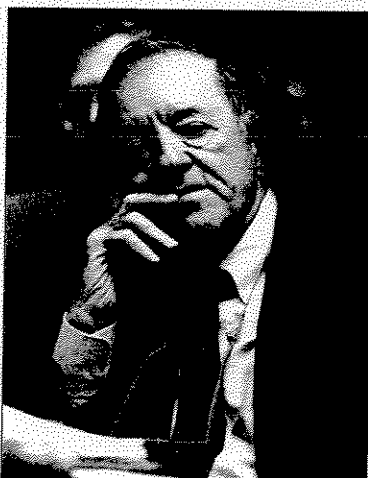
Dr. Faber: Because PNE is a developmental problem, it is a family issue. Good care requires an intuitive pediatrician or family physician who will serve as the rock of support for the family. Nothing of significance can be accomplished in therapy unless the family's emotional needs are addressed.

Dr. Saltzman: My approach as a general pediatrician must be simple, almost simplistic. I need to know the basic elements of the history, the essential laboratory workup, and the most direct and effective means of enuresis control. Do I write a prescription for imipramine, which takes me minutes and causes little financial burden to the family? Do I write a prescription for desmopressin, which also takes me only a few minutes but will cost the family more? Or do I take the time to provide an in-depth session about alarm systems, behavior modification, motivational counseling, comprehensive education, and case management

that keeps them in the office for 45 minutes?

I know the comprehensive approach is what they need, but as a busy clinician I may not have the time to impart all the information as often as may be necessary. I'm certainly not able to give them case management in the home or any other individualized long-term follow-up. Therefore, I frequently refer the family directly to a specialized agency with appropriate expertise. If I make a specific referral with explicit prescribing instructions, some or all of the cost will usually be covered by an insurer or managed care organization.

Dr. Golbin: For primary care physicians, we propose a simple and practical approach. I ask three questions. Is there a family history of enuresis? Does the child sleep deeply or restlessly during the first half of the night? Can you awaken the child from slumber at the time of wetting? The answers to these are enough to enable me to place an enuretic child into one of the five categories that predict the efficacy of pharmacologic and nonpharmacologic interventions (see page 26).



On hypnotherapy and enuresis control...

Dr. Jacobs: Should hypnotherapy techniques be part of a management program?

Dr. Faber: Using education, reinforcement, and relaxation-imagery, combined with close case management, the primary care clinician can achieve success in more than 75% to 80% of children with PNE.¹⁸ A general pediatrician or family physician can use hypnotherapy-based methods of enuresis control fairly easily by helping the child relax, encouraging him or her to focus on an internal image, and then going through a sequence of imagery and suggestion that appeals to the child (see "Hypnotherapy: Why Not Use Imagery and Relaxation in Primary Care?" page 29).

POINT OF VIEW: THE TAKE-HOME MESSAGE

Each faculty member expresses his bottom-line view of how to approach enuresis control practically and cost-consciously in primary care

Dr. Faber: Primary care physicians are well equipped to handle virtually all cases of PNE and most children with secondary enuresis. Ruling out significant disease is straightforward if one looks for evidence of urinary tract infection, diabetes insipidus, diabetes mellitus, hyperthyroidism, neurologic disease, developmental delay, and constipation. The physician's unique responsibility is to explain enuresis and dispel the myths that surround it.



Drawings help children understand what is happening in their bodies, and techniques such as charting their dry nights, reinforcing their successes, hypnotherapy with relaxation and imaging, assigning responsibility for clean-up without punitive implications, and simple, inexpensive alarm systems are effective. The challenge of enuresis provides a wonderful opportunity for children to learn about controlling their own bodies. This alone increases self-esteem. Office management of PNE also allows primary care physicians to enhance their skills in training children in self-regulation and relaxation techniques, behavioral approaches that are useful in pain management, anxiety reduction, and other common challenges.



Dr. Golbin: Enuresis is a common problem, but its pathogenesis is difficult to explain. While the problem is usually self-limited and primary care physicians can treat most enuretic children, the connection between enuresis and disordered sleep is too strong to ignore. Use of alarms and forced awakening alone can cause

more problems than they solve in certain children. A comprehensive program based on education, behavior modification, judicious medication use, and individualized case management is often the most effective cost-saving approach.

Dr. Jacobs: It is incumbent on the primary care physician to teach the family that along with achieving control of nighttime urination there is anger and hostility that needs to be defused and damage to the child's self-esteem that needs to be repaired. When drug therapy is used for short-term control by a physician cognizant of the risks, it is appropriate and safe. There is no place for high-technology evaluation and therapy in PNE, but comprehensive enuresis education and behavior modification programs with individual case-management follow-up can be worth their expense for certain families.



Dr. Kogan: Treatment programs need to be individualized. I have no doubt that, in certain families, an alarm-based approach works well, and that in others, the effective solution will be comprehensive education and intensive case-management support. I also think that in carefully selected situations, there is no reason not to use imipramine or desmopressin. The child with any type of daytime voiding problem, however, is a candidate for closer evaluation and follow-up. The key is to look for patterns in the history and physical examination findings, voiding episodes, and behavior of the child and family.



Dr. Saltzman: First, it is imperative that by the time a child reaches 3 years of age, the pediatrician or family physician ask about bed-wetting during routine office visits and take steps to promote the alleviation of family and marital stress when enuresis is uncovered. Helping the enuretic child understand the problem is appropriate and productive; casting blame by the parents—on the child or on each other—is not. Second, try to raise the enuretic child's self-esteem and normalize intrafamily dynamics. Third, consider age-appropriate interventions that are most beneficial and least harmful.

After the results of history-taking, physical examination (including pelvic evaluation for children of both sexes), and some simple laboratory work are reviewed to rule out complicated or secondary enuresis, the therapy of choice is a comprehensive approach that includes education for the child and the family, a bed-wet-



ting alarm used correctly, reinforcement when dryness is achieved, assignment to the child of some responsibility in morning cleanup, and some form of counseling or individualized attention. It's not easy for a child to help with the laundering of the wet bedding and to take a bath every morning on a school day, but it is important that the enuretic child have responsibility without guilt.

This usually requires no more than 6 months of a physician's attention, and the time and the effort spent are well rewarded by the happiness of the child and family. Even if an outside agency is consulted to provide comprehensive education, behavior modification, motivational counseling, and close case management, the overall cost is far less than would be incurred through inappropriate referral to medical subspecialists, psychiatric therapy later in life to repair damaged self-esteem, and divorce attorneys.

APPENDIX

DISORDERED SLEEP AND ENURESIS: A NEW UNDERSTANDING?

At the Sleep & Behavioral Medicine Institute in Chicago, Alexander Z. Golbin, MD, PhD, and his colleagues have made significant advances in the understanding of the pathophysiology of PNE and how PNE may be a form of disordered sleep.²³ They have developed a means of classifying enuretic children into categories that may be useful for determining which interventions are likely to be effective.

Characteristics of Enuretic Children

Enuresis is a complicated syndrome that comprises a broad constellation of signs and symptoms. Not all signs and symptoms are displayed by every child who wets. The essential spectrum of symptoms includes:

- **Spontaneous, involuntary urination during sleep** This differs from voluntary urination when awake in that nocturnal enuresis is a paroxysmal (sudden) brief outburst, usually of a large quantity of urine, without movements of pelvic muscles.
- **Deviation of sleep patterns** Enuretic children display a wide variety of sleep disturbances that can be witnessed clinically at home and that can be registered and documented in a sleep laboratory.
- **Deviation of daytime alertness and/or motor behavior** Changes in levels of alertness include hyperactivity, motor retardation, clumsiness, emotional instability, fears, inattention, daydreaming, tantrums, daytime sleepiness, and oppositional defiant reactions.
- **A very sensitive attitude toward the affliction, or, paradoxically, a totally indifferent attitude** Some children, even those over age 10, appear not to care about their bed-wetting, or exhibit complete

denial of any problem. Others react painfully, to the point of making suicide attempts.

- **Therapeutic resistance and spontaneous resolution** Some enuretic children resist the most seemingly appropriate or typically effective therapies, then suddenly exhibit a spontaneous disappearance of PNE.

Enuresis and Sleep Stages

Dr. Golbin finds that the act of bed-wetting is associated with switching of sleep stages and that enuretic children commonly exhibit other parasomnias. These may include an increase or decrease in sleep latency (period of falling asleep), abnormally deep or restless sleep, and other parasomnias such as sleepwalking, sleepwalking, bruxism, confusional arousals, night terrors, and nightmares. These sleep deviations develop before bed-wetting. Dr. Golbin's findings support the idea that sleep deviations are the primary factor producing PNE, not the other way around.

When enuretics undergo sleep studies, wetting tends to occur during the so-called paroxysmal delta stage of sleep, which may be deeper and more prolonged than it usually is in children who do not wet. Nocturnal wetting partially arouses the child (Figure 4). This observation provides clinical corroboration for parental reports that their enuretic children are deep sleepers.

After the wetting episode, sleep architecture improves, with more normal sleep stages. This cycle may repeat, with another segment of abnormal (extra deep and extra long) delta sleep, followed by partial arousal and normalization of sleep structure.

Therapies that help normalize sleep architecture are capable of reducing or eliminating PNE. Alarms, for ex-

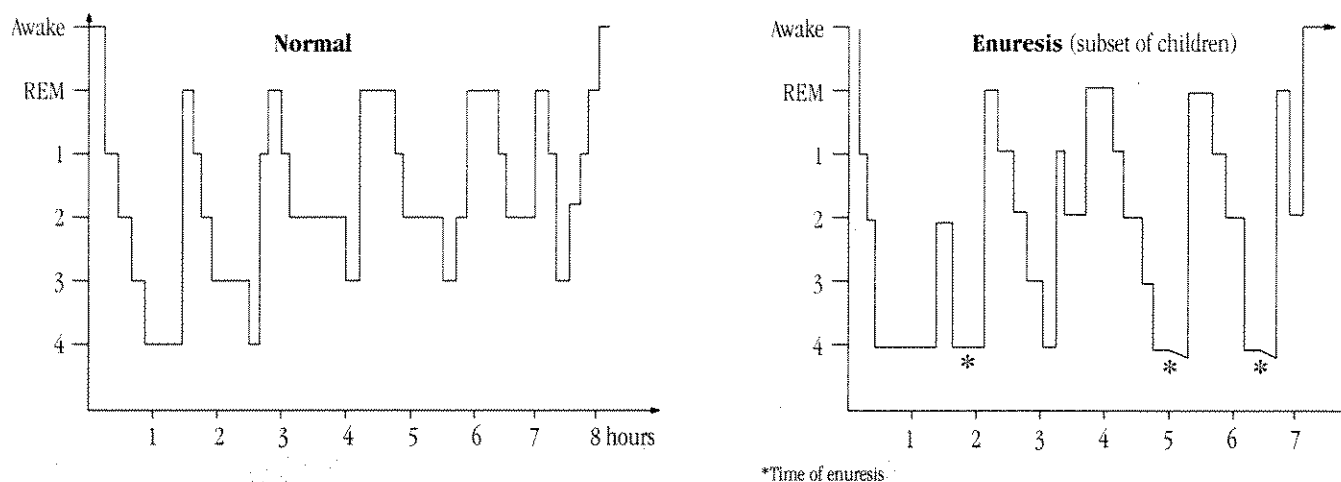


Figure 4—Enuresis may be a compensatory reaction to a long and deep paroxysmal delta stage of sleep, as this somnogram suggests. According to ongoing research into the link between disordered sleep and enuresis, involuntary voiding occurs at the end of the first stage of delta sleep, which in some enuretic children is abnormally long and deep. Many enuretic children pass directly into stage 4 sleep without the brief plateauing at each level that characterizes normal sleep, and they do not enter the rapid-eye-movement (REM) phase of sleep as often as children who sleep normally and are not enuretic.

Nocturnal voiding partially rouses the child, normalizing sleep architecture at least to some extent. If enuresis is prevented in children whose sleep is disordered in this way, other parasomnias can develop to serve the same compensatory function. Alarms may be beneficial as part of a comprehensive treatment program because they magnify the effect of the enuresis itself, ensuring the full awakening of the child. Alarms by themselves are frequently ineffective and may be harmful. Source: Alexander Z. Golbin, MD, PhD.

ample, help arouse the child from abnormal deep sleep, and their mechanism of action can be interpreted within the context of manipulating abnormal sleep architecture. Imipramine also acts to normalize delta sleep. On the other hand, treatments that initially decrease enuresis, such as desmopressin or alarms used alone, have a short-term impact but no effect on sleep architecture. In fact, according to Dr. Golbin, drugs and alarms used alone may induce other parasomnias.

The pathophysiology of PNE, in Dr. Golbin's view, lies in abnormal biorhythms in sleep. Enuresis might be the body's compensatory reaction to abnormally long and deep delta stages of sleep. This compensatory model posits that wetting produces a partial arousal that tends to normalize the pattern of sleep. The key to management of PNE, therefore, may lie in the regulation and normalization of sleep architecture.

These data suggest that some bed-wetters should not be awakened completely from sleep because a forced awak-

ening will not correct the distortions in the sleep pattern. Rather, it will lead to ever greater disorganization of the child's sleep pattern. This is the reason the awakened child typically urinates again as soon as he or she falls asleep. This is also the reason PNE disappears spontaneously when the sleep mechanism matures—its compensatory function is no longer needed.

Clinical Implications

PNE needs to be treated differently in different children, depending on the specific symptom complex, genetic pattern, and sleep disturbance that are involved. Dr. Golbin's research suggests that five forms of enuresis exist, based on the clinical picture, type of sleep architecture, and the patient's response to treatment:

1. Familial enuresis This is the most common category, affecting predominantly boys between 9 and 10 years of age who are deep sleepers. The family history will turn up many bed-wetters. Familial enuretics may fall

Table 5—Differences in Treatment Responses Among the Different Types of Enuresis

Treatment	Procedures	Types of Enuresis*				
		1	2	3	4	5
Behavior modification	Calendars with stars and stickers	-	+	++	-	-
	Bed-wetting alarm	-	-	++	+	-
	Bladder exercises	+	+	++	-	+
	Autosuggestion	+	++	++	+	-
	Hypnotherapy	+	++	++	+	+
	Psychotherapy	-	-	++	-	-
Medication	Imipramine	++	-	-	++	-
	Desmopressin nasal spray	++	+	+	++	+

***Types of enuresis:**

- 1. Familial
- 2. Diathetic
- 3. Reactive
- 4. Endocrinopathic
- 5. Organic

Symbols:

- Not effective
- + Effective
- ++ Highly effective

Source: Alexander Z. Golbin, MD, PhD

deeply asleep almost instantly. They may be somewhat hyperactive and respond well to imipramine and desmopressin but react poorly to enuresis alarms. Hypnotherapy, autosuggestion, and bladder exercises may be helpful for familial enuretics.

2. "Diathetic" enuresis Diathetic enuretics are predominantly girls without a family history of enuresis. They are often very thin. They may present with numerous psychosomatic symptoms, allergies, and histories of recurrent urinary tract infections. Their frequency of bed-wetting can depend on the weather and water intake. They also may have smaller than normal bladder capacities and be restless sleepers, with unusually long first stages of sleep. They usually respond mildly to therapy with imipramine but not to alarms. Desmopressin is partially effective for short-term control. Autosuggestion and hypnotherapy are usually effective, and reinforcement from calendars with stickers may help, as may warm covers and a hot bath.

3. "Reactive" enuresis Usually, reactive enuresis is a secondary rather than a primary form of enuresis, and often develops after a reaction to emotional trauma, such

as may occur at residential schools or sleepaway camps. Reactive enuretics' sleep is characterized by reduced deep delta sleep, a predominance of light sleep, and reduced rapid-eye-movement (REM) sleep. Children prone to reactive enuresis are restless sleepers who urinate frequently and respond particularly well to a program that includes a bed-wetting alarm, but not to imipramine. They also respond well to psychotherapy, education about enuresis, reinforcement techniques, and bladder exercises. Desmopressin may be helpful for short-term control.

4. "Endocrinopathic" enuresis This is related to patients who are overweight. Deep sleepers with reduced but paroxysmal delta sleep, they typically urinate frequently. They respond well to imipramine and desmopressin for short-term control, less well to alarms, autosuggestion, and hypnotherapy. Restriction of salt and water before bed may be helpful.

5. "Organic" enuresis Patients with a history of neurologic problems (such as epilepsy, head trauma, and those associated with craniofacial dysmorphisms) are called organic enuretics. These patients are predominantly boys who

are restless sleepers with markedly reduced REM sleep and who resist attempts at control both by alarms and by medication with imipramine. Desmopressin, bladder exercises, and hypnotherapy may produce partial success in these children.

The practical implication of this classification scheme, according to Dr. Golbin, is that once the physician and parents have identified which category most closely describes the enuretic child, they can initially select the pharmacologic and nonpharmacologic interventions most likely to help the child achieve nighttime control.

Dr. Golbin's clinical correlations are summarized in

Table 5. His advice is to try several strategies. For example, if the child has a family history of wetting and appears to fall deeply asleep rapidly, consider changing the child's position approximately 60 to 90 minutes after the onset of sleep. If the child is repositioned at that time to lying on one side instead of lying on the back or stomach, sleep may be switched to lighter stages, reducing the likelihood of enuresis. Alternatively, the child with reactive enuresis is likely to benefit from a program that includes a bed-wetting alarm and psychotherapy but may not do well with imipramine. The goal of treatment is to stabilize the patient's sleep patterns.

HYPNOTHERAPY: WHY NOT USE IMAGERY AND RELAXATION IN PRIMARY CARE?

Behavioral pediatrician Scott H. Faber, MD, of Rainbow Babies' and Children's Hospital and Case Western Reserve University School of Medicine in Cleveland, encourages general pediatricians and family physicians to take a page from the behavioral/developmental pediatrician's book and use techniques based on hypnotherapy to help children older than 5 years with PNE to attain nighttime control. According to Dr. Faber, an interested clinician can become proficient in the use of imagery, relaxation, and suggestion for this problem in several days. For pediatricians who are interested in delving deeper into medical hypnosis, Dr. Faber suggests the 3-day practical course given by the Society for Developmental and Behavioral Pediatrics. He also recommends these published materials:

Olness K, Kohen D. *Hypnosis and Hypnotherapy With Children*. 3rd ed. New York, NY: The Guilford Press; 1996. The classic textbook on hypnotherapy in pediatrics.

Sugarman LI: Hypnosis: teaching children self-regulation. *Pediatr Rev*. 1996;17(1):5-11. The latest review article, and a reflection of the fact that hypnosis techniques have been mainstreamed into general pediatrics.

Basics of Imagery, Relaxation, and Suggestion

When a child is relaxed and cooperative, formal hypnotic induction is not always necessary to achieve the therapeutic goal in enuresis management. Most pediatricians and family physicians know full well the power of imagination in communicating important clinical messages to their patients. In the office, let the child imagine that he or she feels the urge to urinate but then holds the urine in the bladder, and takes the appropriate steps to avoid wetting the bed.

The ability to imagine controlling the bladder requires age-appropriate explanations of how the brain and bladder are connected and how they communicate. Taking the mystery out of enuresis through education is essential no matter what the age of the child. Even for a very young

child, a drawing of the brain, spinal cord, bladder, and urethra is helpful (Figure 5). The child is encouraged to take the drawings home and to make his or her own versions at home.

Dr. Faber explains to the child that bed-wetting is a communication problem between the brain and the bladder. He makes clear, in age-appropriate language, that bladder control comes with maturity and that bed-wetting does not mean the child is bad or "wrong" in any way. With the youngest children he treats, he uses "kidspeak," but once children are in the second or third grade, they can begin understanding terms such as urine, bladder, nerves, and brain.

In addition to using drawings, Dr. Faber sometimes touches the child's head, then moves his hand down along the spine, and when he gets toward the base of the spine he says: "There's the connection, right there, to where you hold your urine."

To relax the child into a state in which imagery and suggestion can be effective, Dr. Faber engages the child in a quiet, peaceful, and nonthreatening manner. In his own words: "I play with the child. It's a bit like a dance, where we both get into the same rhythm. Sometimes just having the child focus on breathing will do it. Then I encourage the child to go—in the imagination, of course—to a special place where he or she can concentrate on an internal vision, any internal image the child is comfortable with." At that point, Dr. Faber focuses the child on the bladder-brain connection or the urge to urinate.

For example, the child can simply imagine that it's the middle of the night, think about feeling the need to urinate, and then concentrate on keeping the urine in the bladder. Then Dr. Faber will have the child imagine getting up, walking to the bathroom, urinating, and returning to a dry bed. He will go through this exercise once or twice with the child in one session.

More playfully, a child can be a Superhero, pilot, or an astronaut. In one effective scenario, the child can imag-

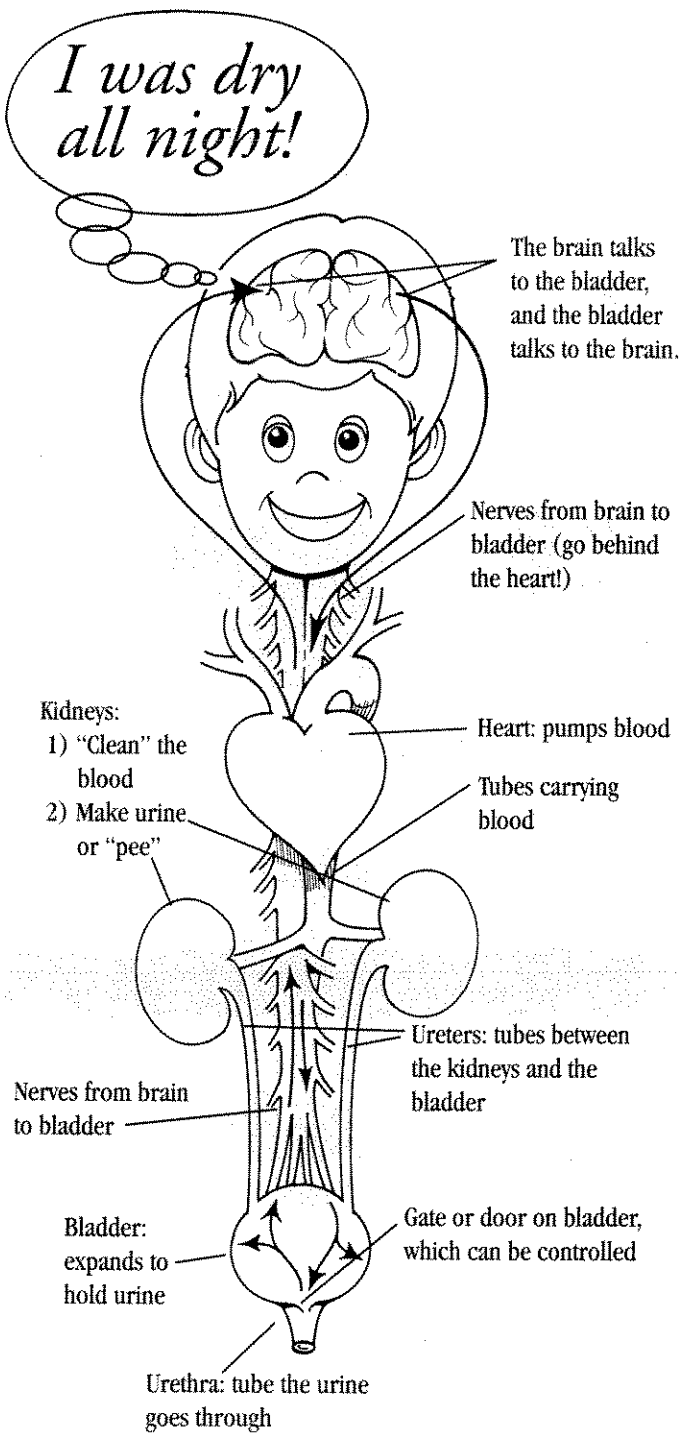


Figure 5. The brain-bladder connection. Adapted from¹⁸. [© 1996. Health Communications, Inc. This patient education illustration may be photocopied by physicians for distribution to their patients. Written permission is required for any other use.]

ine riding in the Batcar with Batman and getting the urge to urinate. The imagery here can go in either of two ways, both acceptable. The child can say: "You know, Batman, I feel the need to pee, but I'm going to hold it in while we ride in your car." Alternatively, the child can say: "Pull the Batcar over, Batman, and wait while I go to the bathroom." Either way, the car—a metaphor for the bed—remains dry.

Hypnotherapy in a Comprehensive PNE Treatment Program

Imagery, relaxation, and suggestion, according to Dr. Faber, are best employed within a larger context of education, demystification, counseling, and behavior modification. His treatment protocol for PNE generally comprises six steps and is effective in significantly improving PNE in approximately 80% of children, with the occasional need to repeat the program:

- Explain enuresis in an age-appropriate way, so the problem is demystified and the emotional baggage of guilt and blame are eliminated.
- Implement a reinforcement calendar for tracking "dry nights" and celebrating dryness the following morning. The calendar features the child's favorite theme stickers.
- Prescribe an inexpensive bed-wetting alarm and educate the family and child about its correct use.
- Assign age-appropriate cleanup responsibility to the child without punitive intent.
- Begin working with the child on relaxation, imagery, and suggestion.
- Have the child practice imagery at home. It is important that the parent not remind the child to practice. The child can draw a "reminder picture" in the office and place it in his bedroom. The imagery practice is often crucial to achieving control in PNE. It can be done alone, or with a parent if the family mood is positive, reflecting enjoyment rather than tension.

Once the child is able to practice imagery at home, Dr. Faber schedules office visits monthly or less frequently.

For physicians who do not have the time or inclination to provide this type of treatment, Dr. Faber recommends referral to a behavioral/developmental pediatrician or clinic with experience in hypnotherapy.

Resources when considering hypnotherapy for an enuretic child include the Society for Developmental and Behavioral Pediatrics, the American Society of Clinical

Hypnosis, the Society for Clinical and Experimental Hypnosis, and the American Board of Medical Hypnosis.

EDUCATIONAL APPROACHES TO BEHAVIOR MODIFICATION

Bed-wetting, as the entire faculty of this symposium agrees, is a common problem. For example, over a period of 18 months, Pacific International, Ltd., a commercial agency that provides individualized education, behavior modification, and case management at home, received more than 250,000 inquiries from families seeking help for bed-wetting—almost 500 per day every day.²⁴

A key element in enuresis education is operative right at the beginning: Many people do not appreciate the significance of the condition. Educating the medical profession about contemporary thinking in enuresis management, according to the symposium faculty, is as important as educating the public.

The damage to a child's self-esteem incurred by uncontrolled enuresis far exceeds the toll taken through extra laundering and loss of sleep. Merely outgrowing bed-wetting does not allow a former enuretic to leave behind the emotional baggage of low self-image. The scientific data point strongly to the conclusion that willful wetting, weak muscles, and small bladders play only small roles in the etiology of enuresis, but countless children suffer emotional damage needlessly from guilt or punitive physical abuse.

Emerging evidence suggests that disordered sleep is a significant factor in enuresis etiology. The World Health Organization has classified nocturnal enuresis as a parasomnia, and the Association of Sleep Disorders Centers defines bed-wetting after age 3 as a disorder. No one, however, knows the real reason for most PNE. For many patients, however, such etiologic precision does not matter as long as potentially serious medical and behavioral problems are ruled out by an experienced physician.

The majority of children can be helped to control enuresis by a combination of age-appropriate education and demystification, family education, relaxation-imagery techniques, correction of poor intrafamily dynamics, and some combination of behavior modification and mo-

tivational counseling. Although none of this is beyond the capabilities and skills of a family physician or pediatrician, not all clinicians have the time to devote to the enuretic child and his or her family that will ensure a good result.

According to Edward J. Saltzman, MD, clinical professor of pediatrics at the University of Miami (Fla.) School of Medicine, and chairman of the American Academy of Pediatrics' Section on Administration and Practice Management, busy clinicians can lead their patients to high-quality and individualized care by turning to agencies that specialize in such comprehensive programs and have the personnel to achieve guaranteed results in patient after patient. Comprehensive education and behavior modification programs can be structured in various ways. The objective is to give the child as much attention as necessary, help the family recognize and correct developing psychopathology secondary to the presence of enuresis and the stresses it creates, and address recidivism in enuresis control promptly, before all preceding effort is rendered a waste.

Such agencies deal with enuresis management from an educational and motivational point of view, not a strictly medical one, so the diagnosis of PNE and the rule-out of serious underlying pathologic conditions by an experienced physician is of paramount importance. Full-service agencies that offer enuresis control programs, according to the symposium faculty, should be multifaceted, be capable of providing completely individualized care, and have the professionalism and integrity to reject cases that do not conform to strictly defined uncomplicated PNE on physical or psychological grounds. For example, if a bed-wetting alarm is deemed to be appropriate, then the program is obligated to offer the education necessary to use the alarm correctly, the data collection tools to track the information the alarm provides (such as frequency of wetting, spot size of wetting, time of wetting, and whether the alarm woke the child), the specific response to any

child's individualized needs, and the means to reinforce progress so control is maintained.

The typical program begins with an initial screening of the child and family by a trained professional. A protocol based on nonpharmacologic methods of treatment is then developed for the child. Intrafamily dynamics are addressed as necessary, and age-appropriate explanations are provided so the child feels no guilt or shame about his or her bodily function and the undesirable wetting. Awareness of the sensation of bladder fullness and the need to urinate is cultivated, using imagery and other teaching techniques that enable the child to exert deliberate control.

Continuous reinforcement by agency representatives of the rewards and positive feelings associated with achieving enuresis control maximizes compliance with instructions. Family members or case managers keep in close contact with the agency by submitting progress reports at predetermined intervals.

An enuretic child is declared dry after a target number of consecutive nights pass without wetting. Usually this ranges from 30 to 60 nights. In the event of relapse—reemergence of PNE within months or years of achieving dryness—the case management agency can provide reinforcement for its partially successful behavior modification and motivational counseling techniques.

ENURESIS CONTROL THROUGH CASE MANAGEMENT

The following is one type of case management approach, involving comprehensive education for the child and the family plus the full range of behavior modification and motivational counseling, that has been associated with high success rates in controlling PNE.²⁴

I. Immediate: The child's primary care physician or other clinician screens to rule out secondary and complicated enuresis.

II. Immediate: The case management agency representative makes an initial home visit.

A. The representative takes the history of the patient and the family.

B. The representative offers enuresis education at the appropriate level of detail to the child and the family.

C. The representative explains how enuresis can be controlled with combined nonpharmacologic methods.

D. The representative provides motivational counseling to maximize compliance with an individualized enuresis control program.

E. The representative monitors the child's progress and the family's comprehension of the treatment protocol daily for 4 to 5 days—or longer if necessary—to be sure that the enuresis control program is being applied correctly.

III. As needed, usually 4 to 6 months: Progress reports are made by the family to the agency every 2 weeks, and new instructions and procedures designed to fit the child's wetting pattern are developed.

A. A case manager is assigned.

B. The case manager gives specific instructions and written guidelines to the child and family.

C. The child and family communicate questions and problems to the agency through the case manager.

D. The case manager provides special services as necessary to help the child with enuresis meet his or her predetermined dryness objectives.

IV. Indefinitely as necessary to completion and satisfaction: Attainment of better and more normal sleep.

E. The enuresis control process is intended to improve sleep quality as well as prevent bed-wetting.

F. Individualized instructions from the case manager are assessed and modified every 2 weeks.

V. "Graduation" on reaching and maintaining the goal: Announcement of success after a predetermined acceptable period of dryness is achieved.

G. Final instructions are given to guard against recurrence.

H. Follow-up is provided by the agency, either by the case manager or a supervisor, for at least 2 years to ensure that relapse does not occur.

REASONABLE EXPECTATIONS AND A TIME LINE FOR HOME CARE

It is reasonable to expect an agency that provides comprehensive management of PNE to take on whatever role is necessary depending on the characteristics of the enuretic child in question and the child's response to previous and present therapy. A reputable case management agency is able to offer whatever mode of therapy a particular child needs. Some children need exercises in holding their urine. Other children need bed-wetting alarms. Still others benefit from imagery and behavior modification techniques. Families also differ in the nature and extent of education, counseling, and other interventions they need to defuse a situation that centers around a bed-wetting child.

Most primary care physicians who are committed to helping children overcome PNE should be able to achieve a high success rate, according to Scott H. Faber, MD, the behavioral/developmental pediatrician on the symposium faculty. Simply with conventional methods comprising demystification, family education, bed-wetting alarms (used correctly in the context of a comprehensive program), cleanup responsibility, and a reinforcement calendar, physicians can achieve approximately a 60% success rate. Addition of imagery, relaxation, and suggestion can be expected to raise the figure to about 80%. When initially successful children relapse, re-treatment will usually help the child return to having dry beds. If all physician and family efforts are initially unsuccessful and the family dynamic is not being affected adversely, a 6-month or 1-year wait before re-treatment can increase the chance of success due to neurologic maturation, renewed motivation, and a reexplanation of the suggested treatment so the recommended procedures are followed.

Most children achieve complete dryness within 4 to 6 months when follow-up is provided for 2 years from the time dryness is achieved. Among families that have reasonably followed through with the enuresis management program provided by Pacific International, Ltd., that includes close follow-up, the success rate among children with PNE approaches 98%.²⁴ The anticipated relapse rate following initial correction may be expected to be approximately 15%, but better than 95% of the children who relapse ultimately achieve control when efforts at correction are repeated. The dropout rate may reach 8% to 10%, but this may be a misleadingly large proportion. Typically, 65% to 70% of the dropouts have attained dryness and quit formal efforts at correction without being involved in further follow-up.

The faculty for the symposium on the control of uncomplicated primary nocturnal enuresis have shared their expertise on current methods for alleviating childhood bed-wetting. Their goal is to give primary care physicians the tools and guides not only to control the physical aspects of enuresis but also to help restore the child's self-esteem and improve child/parent/physician communications. If you have comments on "Enuresis Control in Primary Care" or questions on enuresis control, please contact Enuresis Control, Health Communications, Inc., 397 Post Road, Darien, CT 06820-3647. Telephone: (203) 655-2599; Fax: (203) 656-2852; E-mail: Info@Healthcom.com.

A Critical Review Of Pacific International's Correction Process For The Problem Of Nocturnal Enuresis

By Dr. Douglas Palmenter, Pediatrician

The uniqueness of Pacific International's ability to correct nocturnal enuresis is its case management. From beginning to end, Pacific International has a thorough management process for each individual case.

Pacific's correction rate is 97.9% of the pure cases; that is where the client has sent in the report cards and followed the program and the procedures.

Definition - We define functional nocturnal enuresis as incontinence during sleep in the absence of organic defect or disease. There is a general agreement that this encompasses more than 97% of all nocturnal enuresis cases.

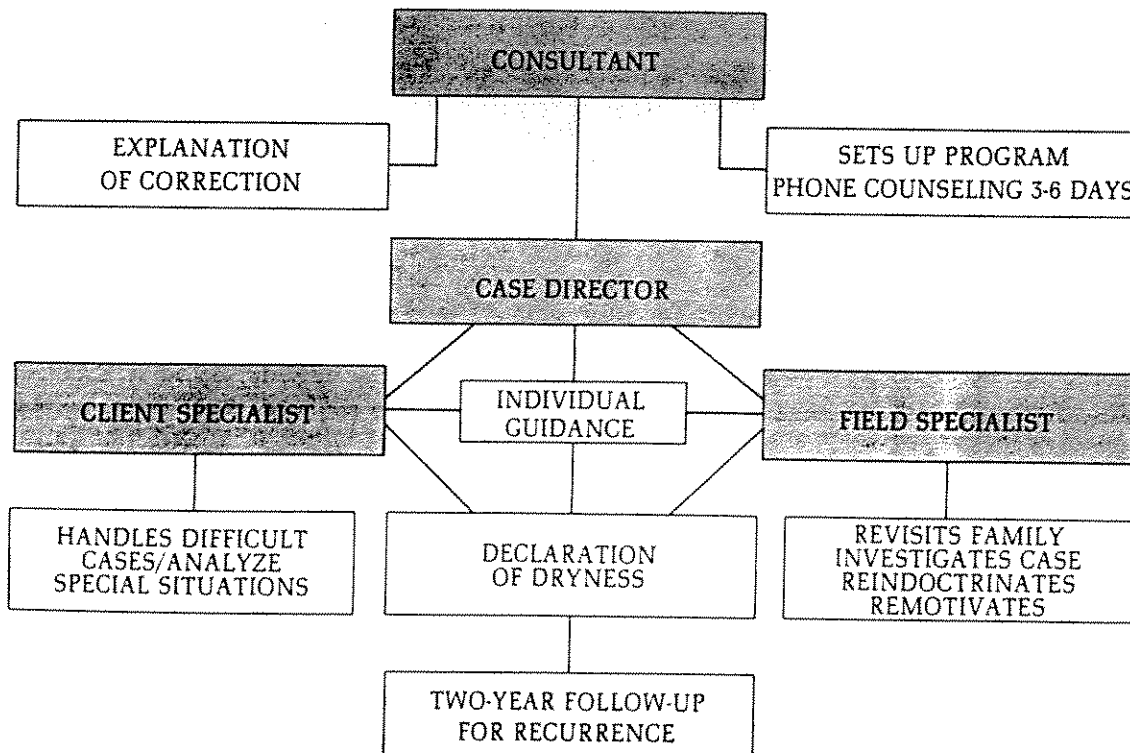
Incidence - Statistics on the subject show a considerable variation, approximately 16% between the ages of 4 and 16 and as high as 20% according to some reports. There is evidence to show that there is a high percentage of adults still wetting, even though it is supposedly "common knowledge" that it is outgrown. Thorne's findings in a study of 1,000 army selectees show that a high percentage continued into adulthood. Bier, in a study of 1,500,000 men called up for examinations between 1960 and 1962, revealed that 11% had the problem of enuresis.

Pacific International works for a **proper correction**; meaning not only a **dry child**, but one that learns to **sleep better or more normally**.

The introduction of electroencephalography in the early 1950's made possible sleep monitoring of children with nocturnal enuresis. Early results showed that enuresis occurred during lighter sleep stages (Ditman L, Blin LA 1955). Broughton 1960 proposed a different theory that enuretics slept normally but had an abnormal arousal. He described enuresis as an episode beginning in the deepest sleep stage, from which the enuretics lightened their sleep but were unable to wake up completely. Mikelsen and Rapoport (1980) did a very extensive study which stated that nocturnal enuresis was independent of sleep stage and hence could take place during both deep and light sleep.

The flow chart below provides an illustration of case management at Pacific International.

CASE MANAGEMENT



Pacific's program begins with the **Consultant**, who educates the parents and provides a basic understanding of the sleep problem. The **Consultant** then sets up the program, indoctrinates the parents and the child together and motivates the enuretic so there is a complete understanding of the program within the family.

The **Consultant** then contacts the family the very next morning and calls them a series of three, four, five or six times. In some instances, they will call for up to two weeks or more to counsel the parent and enuretic to make sure the program is running properly and to deal with any problems they may be encountering. In 1980, J. Bollard and T. Nettlebeck reported "adequate patient-therapist contacts appear to be an important factor in the effective treatment of nocturnal enuresis in children when the treatment is based on the use of a urine-alarm device."

The **Consultant** provides proper education, a full explanation of the problem and use of the urine-alarm, as well as specific procedures and instructions to carry out the program effectively. The excitement level and motivation that is created by the **Consultant** has a tremendous impact on rapid correction, as well as reducing the relapse rate. By initiating the correction process properly, they are able to circumvent learning obstacles before they occur. A study done by Azrin (1973) found no reduction of bedwetting by the urine-alarm apparatus unless social and motivational events were associated with the buzzer.

After the **Consultant** has indoctrinated the parents and child, the case is assigned to a **Case Director**. The **Case Director** has expertise and training in the art of directing and guiding each case in response to a report card sent in to the Center every two weeks until the enuretic has become dry.

The urine-alarm is utilized to establish the wetting pattern so the **Case Director** can properly direct and guide the enuretic through the program every two weeks (in response to report cards) until dryness is achieved. The urine-alarm, which is called a Little Watchman, is used for motivational purposes. It is utilized to obtain data throughout the program until dryness is achieved.

Literature reveals that the initial rate of arrest can be as high as 80-90% with the urine-alarm (Jones 1960, Lovibond 1964, and Yates 1970). However, relapse rates have been reported to be as high as 69% when using an alarm only (Young and Turner 1965). Twenty to 25% of the people who inquire of Pacific International have used a urine-alarm or device previously without success.

It is crucial to have the child interested and actively involved in attempting to achieve dryness (Fritz and Armbrust 1982). The child is encouraged to assume responsibility for his or her enuresis and to be an active participant in the treatment program (Marshall and Marshall 1973). This promotes development of a positive relationship between parents and child and provides positive reinforcement. It is important to clarify that the child is not at fault and punishment for bedwetting is discouraged. The child is encouraged to assume responsibility for his or her own learning. Responsibility-reinforcement therapy is one form of this approach. "Sensation awareness", an improved recognition of bladder sensation and fullness, is another responsibility that the child assumes (Rushton 1989).

The **Case Director** utilizes various methods of *reinforcement, including individual instructions, continuous reinforcement and over-learning*. It is the continuous reinforcement and the over-learning of the **proper instructions at the proper time** which achieves the ultimate correction rate. These instructions and procedures are sent to the client every two weeks, in response to the client report cards, instructing both the parent and the enuretic in how to deal with the problem. The instructions are usually addressed directly to the enuretic for motivational purposes. Parental support, empathy and patience are key elements in any successful plan of management of the child with enuresis. Likewise, reassurance, periodic feedback and encouragement of the parents and child are necessary for optimal results (Rushton 1989). A similar step-by-step program developed by Martin Scharf utilizing a urine-alarm along with reinforcement techniques, involvement and participation of parent and child has a 91% proven success rate.

Intermittent reinforcement and over-learning may decrease relapse (Bollard 1982). This, **combined with guidance**, is the keystone to achieving a **proper correction**. This method, which incorporates the use of the urine-alarm with a variety of other procedures can be closely compared to the enuresis method developed by Azrin, Sneed and Foxx (1974) which has been reported to be highly effective.

As the program progresses and if more intricate or difficult problems occur, a **Client Specialist** may enter the picture and help deal with that individual problem in the case until it is overcome. The case is then either directed to the end by the **Client Specialist** or returned to the **Case Director**. Dry bed training has been found to be superior to the use of the alarm alone, no treatment, and retention control training (Azrin, Sneed and Foxx 1974; Azrin and Thienes 1978; Bollard and Woodroffe 1977 and Doleys, Cominero, Tollison 1977). It also has the lowest rate of relapse of all treatments. A simple modification of treatment to include a period of over-learning has been found to reduce the relapse rate substantially (Young and Morgan 1972b, 1972c; Taylor and Turner 1975).

The positive reinforcement, combined with the client's access to either a **Case Director** or a **Client Specialist** as the program progresses, makes the difference in the correction process as well as dramatically reducing the high percentage of relapse that exists using an alarm only.

Pacific International also has **Field Specialists** on staff. These individuals are eminently qualified to go back to the home and investigate and evaluate a case that has not become dry for whatever reasons. If the **Field Specialist** then believes that the case can be corrected, Pacific indoctrinates and remotivates both the enuretic and the parents in a positive manner so they can achieve a quick and **proper correction**.

The case is directed until a declaration of dryness is provided by the **Case Director**. Pacific requires at least 30 consecutive nights of dryness before the case is declared dry. Some cases require as long as 40 consecutive nights of dryness and some as long as 60 consecutive nights of dryness before the **Case Director** declares that case dry.

When dryness is declared, final instructions are provided to the parents for the child to follow for a period of time to assure there is no regression or recurrence problem.

There is a two year coverage for relapse in the event there is a problem. Any recurrence is reported to the Case Direction Center on what are called "spot cards".

Pacific has a relapse rate of 15%. These are recorrected by utilizing several different methods.

1. Some cases receive **reinforcement procedures**, without the urine-alarm, which clear up the wetting and the program itself need not be formally reinitiated.
2. In relapses where there is no apparent indication of what caused the recur, **reinstitution of the program** is instigated and a recorection can be accomplished.
3. Where there is an indication of **other problems** that may have **caused the recurrence**, **special procedures are initiated** so that a recorection can be accomplished.
4. In highly **difficult or intricate cases** of recurrence, a **revisit by a Consultant or Field Specialist** may be necessary to reinitiate the program.
5. When a case recurs a number of times, a complete investigation takes place to discover what the problems are. These **cases are called Yo-Yo's** and normally a **thorough investigation reveals the problem** and a **proper correction** is achieved.

If there are individual problems, counseling and adjustments help to assure that the individual can overcome these problems, no matter what they might be. This is the uniqueness of the correction process itself.

Summary - A review of literature on the subject reveals that the urine-alarm is able to achieve dryness with a high percentage of correction. However, **the alarm alone carries a high relapse rate**. After reviewing Pacific International's case management methods from beginning to end, it is noted that a combination of the alarm and, most importantly, the **case direction and motivational techniques make the difference** in achieving and maintaining a **proper correction**.

Pacific puts the emphasis on a **proper correction** as well as a dry bed. The Consultant, the Case Director and, if necessary, the Client Specialist and/or Field Specialist all play a role in achieving this objective. The ability and willingness of **Pacific to revisit the family**, the **individual guidance throughout the program*** until conclusion, the **follow-up with final instructions** to prevent any recurrence or relapse, and the two-year **coverage of any recurrence problem** make the Pacific correction process superior.

*The fact that many interdependent variables may be involved in the etiology of enuresis requires a flexible, multidimensional approach to its treatment. As Graham (1973b) states, "(trying) to treat all cases of enuresis the same way is like a golfer who goes round the course with a single club" (p. 279). Both are inadequate to the needs of the situation (Sorotzkin 1984).

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Bruxism With Enuresis And Its Inter-Relationship

It has been reported that signs and symptoms related to bruxism have been found in up to 78% of the population. (1)

In a study done by Glaros of 1,052 dental patients, 30.7% either had past or current bruxism. (2)

The literature shows that nocturnal and diurnal bruxism are two different problems occurring in different sleep stages with different etiologies. (3, 4, 5, 6, 7)

This review will concentrate upon nocturnal bruxism - its relationship with nocturnal enuresis and its correction, by utilizing a moisture-sensing alarm along with individualized behavior modification procedures and support.

Sleep-related bruxism can result in many conditions; for example, symptoms such as pain, or clicking sound, temporomandibular joint (TMJ) pain, grinding down of the teeth and destruction of dental restoration and, ultimately, degenerative joint problems. (8)

Reding and Associates found bruxism to occur in all stages of sleep with it being prevalent in stage 2. They reported that little tooth grinding occurred in stage 1, Rapid Eye Movement (REM) stage, which conflicts with some of the theories that bruxism occurs in light sleep only. (9)

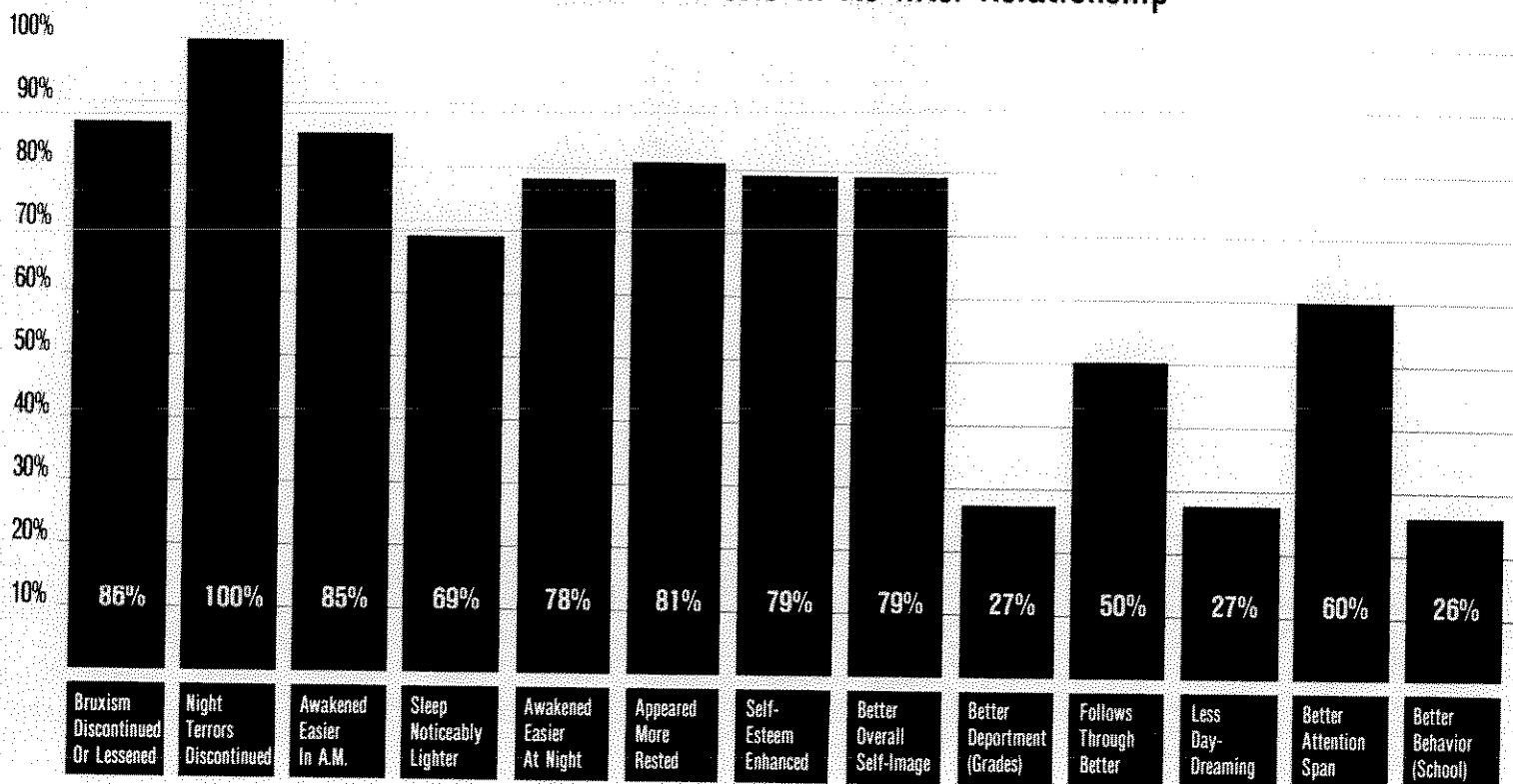
In a recent study done by Ware and Rugh, they utilized three different groups. One was a destructive group, which had complaints of severe TMJ and masticatory muscle pain believed to be caused by chronic sleep-related bruxism. This group totaled five female patients. The second group consisted of a sleep group that was referred for evaluation for either insomnia or excessive daytime sleepiness. They selected for the third group nine depressed female patients complaining of insomnia, who were included as a control group. (10)

They reported the bruxism in all groups usually was accompanied by general body movement regardless of its sleep stage relationship. This report hypothesized that REM sleep bruxism results in greater masticatory force and greater stress on the muscles surrounding tissue, teeth and temporomandibular joint. "This greater force results in the symptoms and problems seen in the destructive bruxism group. From the current data, it appears that as little as one minute of REM sleep bruxism per night may contribute to the destructive bruxism symptoms." This study stated the current results suggest that in attempting to study and deal with the etiology, pathological consequences and management of these patients, it may also be useful to subdivide bruxism into the stage of sleep during which it occurs.

Since 1983, hundreds of cases of nocturnal enuresis were corrected by a comprehensive program using a moisture-sensing alarm, along with individualized behavior modification and support. A reoccurring phenomenon was observed. When a case of enuresis was corrected through this method, a high percentage of the bruxism, night terrors and sleepwalking dissipated and disappeared entirely. After analyzing this for years, it appeared that there was a relationship between correcting nocturnal enuresis and nocturnal bruxism as well as other parasomnias.

As a result of our observations, an investigative survey was initiated. 193 cases were surveyed and interviewed before and after the correction of their nocturnal enuresis. Correction occurred by utilizing a moisture-sensing alarm, along with individualized behavior modification and support. Management of the case occurred every two weeks by written instructions, phone calls, utilization of audio cassettes for both motivation and technique. Procedures were altered to accomplish the correction depending on how the enuretic was responding to the treatment. Length of correction: 4 cases took 2 months, 56 cases took 3 months, 86 cases took 6 months, 29 cases took 6-9 months, 12 cases took 9-12 months, 6 cases took over a year. 122 were male, 71 were female, 10 were adults. All subjects had the problem of bruxism (nocturnal tooth grinding). Four cases had night terrors. 100% of the cases reported that their enuretic was initially a deep, sound sleeper, which they were unable to arouse. After the correction of their enuresis, these results were reported: 86% of the subjects discontinued or lessened their bruxism. 100% of the night terrors discontinued. 85% reported that after treatment, they woke up easier in the morning. 69% said that they could observe a distinct difference in their sleep where they had appeared to sleep very deep before correction and much lighter after. 78% reported that the subject was easier to wake up at night and 81% reported they appeared to be more rested. Improvement occurred in their behavior which enhanced their self-esteem. 79% reported that they could see an improvement in their self-esteem and being proud of themselves. 79% also reported a better self-image. 27% showed definite improvements in deportment (grades) and 26% improved in their behavior in school. 50% showed a better ability to follow through after starting a project or an activity. 27% showed less daydreaming. 60% showed a better attention span. (See chart.)

Bruxism With Enuresis In Its Inter-Relationship



193 cases were surveyed and interviewed before and after the correction of their nocturnal enuresis. Correction occurred by utilizing a moisture sensing alarm, along with individualized behavior modification and support. Management of the case occurred every two weeks by written instructions, phone calls, utilization of audio cassettes for both motivation and technique. Procedures were changed to accomplish the correction depending on how the enuretic was responding to the treatment. 122 were male, 71 were female, 10 were adults. All subjects had the problem of bruxism (nocturnal tooth grinding). Four cases had night terrors.

Other investigators have reported similar observations. Clark, Beemsterboer and Rugh utilized nocturnal electromyographic (EMG) recordings of the masseter muscle before and after treatment in 10 heavy bruxism subjects. The treatment consisted of giving the subjects an auditory feedback signal during sleep, which occurred when they clenched with moderate force. Each subject additionally had to perform an arousal task every time the signal occurred. Nine of the ten subjects demonstrated a significantly decreased EMG activity during a contingent auditory feedback signal combined with an arousal task. They reported, "The control of bruxism during sleep may be similar to the problem of controlling nocturnal enuresis. Both forms of behavior occurred during sleep without subject awareness." (11) Mowrer and Mowrer (1938) first reported the use of conditioning procedures to control nocturnal bedwetting. (19) "In the treatment of enuresis, it is a common practice for the mother to completely arouse the child for several minutes following each event by taking the child to the lavatory and remaking the bed." In the treatment of bruxism, on the other hand, subjects had been allowed to return immediately to sleep following each bruxism episode. Kardachi and Clarke (1977) reported that the feedback signal used in their study did not even awaken the subjects. (12)

Clark, Beemsterboer and Rugh went on to say, "These results indicate that for our sample group, nocturnal auditory feedback was effective in reducing bruxism when it was combined with an arousal task." (11)

Heller and Strang (1973) employed a sound-sensitive device (13) whereas DeRisi (1970) employed a pressure-sensitive switch mounted in a bite plate. (14) The methods of Kardachi and Clarke (1977) (12), Butler et al (1976) (15) and Rugh and Solberg (1975) (16) are very similar in their approach.

In view of our observations and those of other researchers, Pacific International structured a program to emulate the correction process used to correct nocturnal enuresis. In order to accomplish that, a Galvanic Skin Response Sleep Stage Detector (GSR) was used as a signal device to arouse the bruxator. This replaced the moisture-sensing device that was utilized in the correction process for enuresis.

The GSR operates by reading the skin resistance bio-chemically when a rapid change occurs in the sleep. This can be adjusted to the individual differences and works much like a lie detector. This signal enables the bruxator to wake up and perform an arousal task as in the enuretic program.

The program was then structured exactly like the enuretic process in correcting enuresis. A Consultant was utilized, a case history of the entire family situation was taken, the Consultant then educated the family and explained what step-by-step processes would be done and how the program itself would be implemented and carried out. The individual behavior modification process was tailored to the bruxator utilizing support for the family and for the bruxator. Management of the case occurred every two weeks by written instructions, phone calls, utilization of audio cassettes when needed for both motivation and technique. Individual reinforcement and overlearning techniques were utilized. The bruxator was required to drink water before going to bed and perform awareness tasks to accomplish wakefulness during the process. An investigation of diet and the elimination of extreme uses of caffeine, milk products and sugar products was instigated in those instances where over-use was evident.

Six cases were studied using this process. Five were female and one was male. The age range was between 23 and 36 with an average mean 31. All of them had been diagnosed as having bruxism and extreme TMJ symptoms with pain and headaches. Each case was handled individually, depending on how long it took to overcome the bruxating, the symptoms, etc. One case took 3 months, two cases took 3½ months, two cases took 6 months and one took 7 months. Each was declared over the problem after the cessation of the TMJ and bruxing occurred for periods of 30 to 60 days. All six cases were conducted between February of 1989 to August of 1989. Follow-up investigation; five had no relapse, one had a relapse that was reported. An investigation of the individual's diet and readjustment of it resulted in a curbing of the relapse and the cessation of the symptoms.

Discussion - This survey and investigation indicates there are similarities between nocturnal enuresis and nocturnal bruxism. By emulating a comprehensive, educational program, such as utilized in the correction of the 193 enuretics in this survey, we hypothesize that there are similarities and results between the correction processes for the two maladies.

The similarities may be related to the belief that enuresis occurs in the REM stage as well as other stages. Broughton (1967) found that the bedwetter would rise from a deep level of sleep to the REM state, wet and immediately return to stage 4. (20) The fact that recent studies have shown that the destructive state of bruxism occurs in the REM stage, may have significant meaning. The fact that other parasomnias, sleep-walking and night terrors diminish when a comprehensive program for the management of enuresis has been accomplished may indicate that an approach such as this may be of benefit.

Other investigators reported "Effective treatment of nocturnal bruxism may require more than simple feedback of the masseter EMG activity. The addition of an arousal task alone also seems insufficient. One of the more successful treatments of nocturnal enuresis involves an elaborate procedure whereby subjects are awakened, must change the bed and then practice the positive response of urinating in the toilet. Azrin, Sneed and Fox (1974) (18) - Nocturnal bruxism may require a similar comprehensive procedure. Self-administered treatment may require a device that has subjects get up and out of bed and be fully awake before the machine turns off. Positive practice can then follow, perhaps using a programmed tape with subsequent automatic resetting of the bio-feedback device as the subject returns to sleep." (17)

Further studies will be directed at a large number of cases and the effectiveness of a comprehensive educational behavior modification program that is tailored to the individual bruxator.

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- Pacific International is a 48 year -old local business managing over 10,000 patients annually with Nocturnal Enuresis nationwide

- The therapy of choice for Nocturnal Enuresis is the Bell and Pad program with behavioral modifications as provided by Pacific International

- Nocturnal Enuresis is documented to decrease self-esteem and quality of life for individuals, treatment reverses this. Care givers spend up to 1,200 additional hours annually caring for these children.

- Pacific International therapy includes retreatment for 2 years.

- The Wisconsin Medicaid is currently paying for the more toxic and costly second line therapy not the first line therapy.
 - ◆ Most people are currently treated with drugs such as DDAVP because of its simplicity and it is covered by insurance

- Pacific International therapy is a more cost effective when compared to DDAVP.

Pacific International	\$2,628/successful outcome
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Oral DDAVP	\$3,618/successful outcome
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Inhaled DDAVP	\$5,386/successful outcome
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- Children receiving vasopressin has been associated with 23 hospitalizations from seizures, 1 death, 10 % hyponatremia and other adverse advents

- While on therapy, up to 85% relapse after stopping DDAVP.

History of Pacific International

Pacific International was originally started by Robert C. Stearns in 1951, in the San Francisco Bay area. Hence, the name Pacific. Mr. Stearns developed and ran the company up until 1968.

At that time the company was sold to the order of St. Paul (Catholic Church), and they owned Pacific International until 1971. It then came back to two brokers named Robert Bernstein and Barry Pearl. Mr. Stearns, Mr. Bernstein and Mr. Pearl then operated the company up until 1976.

In 1976 Eugene B. Draper bought the company from Bernstein, Pearl & Stearns. Pacific International is a Wisconsin based corporation and is solely owned by Eugene B. and Pamela Draper.

When Mr. Draper took over the company, the Case Direction Center was located in Wayne, Pennsylvania. Mr. Draper operated the company along with another Case Direction Center in Nekoosa, Wisconsin, until 1978, when the Case Direction Center was then moved to Nekoosa.

The original Case Direction Center was built in 1982.

The old Case Direction Center, which was located at 311 1st Street, was abandoned and it then became the Communication Center at which time setting the appointments for the Consultant was established in 1984. M & L Acceptance Corporation, which finances the program for Pacific International, is now housed at the 311 1st Street location.

The Communication Center is responsible for setting all the appointments throughout the United States and Canada. They average 400 to 600 appointments per week. The new Center has the capability of making 1,000 to 2,000 appointments per week.

The Case Direction Center has a staff of 42.

The Communication Center has a staff of 49.

M & L Acceptance Corporation has a staff of 17.

In the Field, we have between 45 and 60 Consultants (salespeople) who market our program directly in the home. By the end of 1998, we expect to have 75 to 80 Consultants in the Field on a consistent basis.

In 1998, Pacific International consolidated the Communication Center with the Case Direction Center, which is now this entire building. At that time, the original Case Direction Center was renovated and the expansion of the Case Direction Center continues on the south bank to the end of the new building.

On the north bank of the new expansion is the Communication Center.

The expansion of the Case Direction Center enables it to handle up to 20,000 cases per year.

It currently handles between 7,000 to 8,000 cases per year, and in 1998 we anticipate doing 9,000 to 10,000 cases.

In 1999, we anticipate doing 15,000 cases, and in the year 2000, we anticipate doing 20,000 cases.