Why does my child have damp pants?

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Enuresis

- Involuntary voiding at an inappropriate time or in a socially unacceptable setting

Voiding disorders

- Successful treatment
  - Proper identification & tailored therapy
- Majority are easily treatable but requires vested interest by family
- Severe disorders or refractory cases require referral to specialists

BOWEL AND BLADDER CONTROL

1. Nocturnal bowel control
2. Daytime bowel control
3. Daytime control of voiding
4. Nocturnal control of voiding
Epidemiology

• Most healthy children can manage to stay dry during the day by the age of 4
• Mean age is 2.4 years (0.75-5.25 years)
• Diurnal enuresis (daytime urinary incontinence) is involuntary leakage of urine in a child older than 5
• Studies in children ages 6-7 have shown that 3.1% of girls and 2.1% boys had an episode of daytime wetting at least once a week
• Of all children with enuresis, 10% will have day symptoms, 75% night symptoms, and 15% will have both

Signs and Symptoms of Dysfunctional Voiding

• Urinary incontinence (damp to soaked)
• Frequency/Infrequent Voiding
• Recurrent urinary tract infections
• Painful voiding (dysuria) / penis pain
• Urgency
• Incomplete bladder emptying
• Constipation

History

• Detailed elimination history
  – Bladder and bowel
• New development
  – Common
  – Stressful event
• Pattern of incontinence
  – Continuous = ectopic ureter in girls
  – Temporal relationships
• Rule out organic factors
  – UTI
  – Diabetes
  – Epilepsy

PE

• Abdominal exam
  – Bladder distension
  – Palpable stool in colon
• Genital examination
  – Skin irritation and erythema
  – Damp underwear
  – Skid marks
• Back exam
  – Skin lesions, pigmentation, tufts of hair
  – Palpable coccyx
Spinal dysraphism

Ectopic ureter

Female epispadias
Voiding disorders

I. Minor dysfunctional disorders:
1. Extraordinary daytime urinary frequency
2. Stress incontinence
3. Post-void dribbling

II. Moderate dysfunctional disorders:
1. Lazy bladder syndrome
2. Overactive bladder
3. Dysfunctional elimination syndrome

III. Major dysfunctional disorders:
1. Hinman syndrome
2. Transient urodynamic dysfunction of infancy
3. Myogenic detrusor failure

- Understanding of voiding and stooling pattern is vital
- Volumetric voiding diary
  - Toilet hat
  - Calibrated cylinder
Treatment Options

- Timed Voiding
- Double Voiding
- Vibrating Watch
- Star/color Chart
- Timer
- Foot Stool
- Legs Apart
-“Sigh”/Deep Breaths
- Prophylactic Antibiotics
- Treat Constipation
- Avoid Caffeine/Aspartame
- Patience
- Anticholinergics

Extraordinary urinary frequency

- Urgency & frequency q 10-20 minutes
- Often no nighttime symptoms
- 3-8 y.o., Spring & Fall, ? Etiology
- Self-limiting (avg. 2.5 mos.), U/A and culture

Lazy bladder

Infrequent voider (q 8 - 12 hrs.)
with incontinence
- capacity, highly compliant bladder
- Normal, unsustained, or absent detrusor contractions
- Straining to void is common
- Infection and constipation are common
- May have large residual urine
Timed voiding

- Watch or alarm q 2-3hrs
- Common day events
  - Bedtimes, Mealtimes, & Between Meals
    - First wake-up
    - Breakfast
    - Mid-morning
    - Lunch
    - Mid-afternoon or school ending
    - Dinner
    - Bedtime

Overactive Bladder

- Daytime urgency and incontinence
- Holding maneuvers
  - Leg crossing
  - Squatting
  - Vincent’s curtsey
- Elimination diary
  - Small functional bladder capacity
  - Urinary frequency
  - Constipation

Overactive bladder

- Multiple terms
  - Bladder instability
  - Urge syndrome
  - Hyperactive bladder
  - Persistent infantile bladder
  - Detrusor hypertonia
- Most common voiding dysfunction encountered
- Peak incidence
  - 5 to 7 years old
Overactive bladder associated issues

• Recurrent UTI's
• Vesicoureteral reflux: 33-50%
  – Addressing overactive bladder or dysfunctional elimination problems
    • reflux resolution 3x compared to controls
• Constipation

Testing?

• Uroflow with post-void residual
• Renal and bladder ultrasound
  – Recurrent cystitis
• VCUG
  – Recurrent febrile UTI’s
  – Large residual in male
• Urodynamics

Complex Lower Urinary Tract System Dysfunction

• Anticholinergics
  – Bladder relaxant & anti-spasmodic
  – Enables child to “make it” to the next scheduled timed voiding for bladder behavioral modification
  – Must treat constipation prior to initiating Rx
    • Common pitfall
      – Initial improvement followed by relapse
• Dysfunctional Elimination Syndrome: urinary incontinence, constipation, stool incontinence and/or recurrent urinary tract infections
• Nonneurogenic Neurogenic Bladder (Hinman Syndrome): final result of severe voiding dysfunction. Can lead to residual urine, reflux, recurrent pyelonephritis and ultimately renal insufficiency
**VESICOSPHERIC DYSFUNCTION**

- "Spinning Top"
- "Milk Back" Phenomenon

**Detrusor sphincter dyssynergia**

- Biofeedback/Pelvic muscle retraining
  - Varying success rates - 51-83%
  - Difficulty maintaining child's interest & attention
  - Computer games/Physical therapy
- Alpha-blockers
- OnabulatoxinA
- Urethral dilation

**Nocturnal enuresis**

- Definition of Enuresis: persistence of inappropriate voiding of urine beyond the age of anticipated control
  - "Nocturnal" or "both nocturnal and diurnal"
  - Primary (never been dry at night) or Secondary (have had a dry period of at least 6 months prior to wetting again)
- Incidence of Nocturnal Enuresis:
  - 15% of children age 5
  - 5% of children age 10
  - 1% of children age 15
  - But only 1/10,000 (0.01%) at 18

**PNE Etiology**

Interactive Triad

- Sleep arousal

- Urine volume
- Bladder capacity

- No nighttime awakening when bladder is full
- Urinary volume exceeds functional bladder capacity

Result: Nocturnal enuresis
**Etiology**

- Genetic: Both parents 77%, one parent 44%, neither parent 15%
- Maturational: arousal delay, small bladder
- Sleep disorder
- Upper airway obstruction
- Urinary tract infections
- Nocturnal polyuria (less ADH)

**Nocturnal Enuresis**

**Psychological Impact**

- Increased stress and anxiety
- Embarrassment
- Decreased confidence
- Negative self-image
- Several studies show increased self-esteem after successful therapy

**Treatment**

- Motivation is key
  - Is bed-wetting a problem for the child and/or family?
    - Parent
    - Child
- Age and maturation
  - Socialization
- Alter voiding and drinking habits
- Pull-ups do not delay resolution

**Treatment Options**

1) Behavior modification therapy
2) Pharmacological therapy
3) Observation

- Individualize therapy
- Consider combination therapy
Behavior Modification

- Bladder training ("retention control training")
  - Theory—bladder is small
  - Conscious attempt to stretch bladder
  - Not effective

- Responsibility Reinforcement
  - Progress record or "gold star" chart
  - Child must take active role

Behavior Modification

Enuresis Alarm

- Signal alarm device
- Triggered when child voids
- Evokes conditioned response—awakening with inhibition of micturition
- Most effective behavior modification method
  - 60–100% cure
- Requires cooperation, motivation, and commitment
  - Typically requires use for at least 4 to 6 mos.
  - May be disruptive to family
  - Announces wet bed to family again
- Failure?
  - Lack of parental/child understanding and cooperation

Pharmacologic Therapy

- Imipramine
- Oxybutynin*
- Desmopressin acetate

*Not approved for the treatment of PNE

Treatment of Enuresis

Isolated nocturnal enuresis

Behavior modification

Conditioning therapy
  Positive reinforcement

Pharmacotherapy

Desmopressin acetate
  Imipramine

Follow-up (3 months)

Success
  Improvement

No improvement

Follow-up (2 weeks)

Success
  Continued wetting

Continue
  Pharmacotherapy

Change drug or add behavior modification
Summary

• Incontinence in children is a common problem.
• Behavioral modification can fix a wide variety of problems.
• Catch minor problems early before they become major problems.
• Incontinence can affect a child’s psychosocial as well as their physical health.