# Enuresis in Children

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- Passage of feces or urine
- In inappropriate places
- Inappropriate to developmental age and level

- **Toilet training is affected by:**

  IQ

  Social maturity

  Culture

  Child-parent interaction

## Developmental coarse:

1. Night fecal continence
2. Day fecal continence

3. Day urine continence
4. Night urine continence

# Enuresis

- >5 years of age (or developmentally equivalent)
- At least 2 nights per week for 3 months – or if lower cause significant distress or impairment in functioning
- Urinating into bed or cloths

- Involuntary (most) or voluntary
- Nocturnal (most), diurnal, both
- Not  due to GMC or substance effect

- **GMC:**
- Structural abnormalities
- Infections
- Neurological disorders
- DM or DI
- Seizure

- **Substance:**
- Intoxication
- Drug side effects

# Prevalence

- Boys more than girls
- Decreases with increasing age
- Remission rate is 15%  per year (good prognoses)
- In 5 years old boys: 7%
- In 5 years old girls: 3%
- In adults: 1%
- 82% of 2 years olds have no continence

# Etiology

**Physiologic factors have major role in enuresis**

**Normal bladder control is influenced by:**

- **Genetic factors:**

  -75% of enuretic children have history of enuresis in their 1st relatives

  -If one parent has history of enuresis, risk of enuresis in offspring is 44% (5-7 times increase)

  - Prevalence in MZ twins more than DZs

- **Neuromuscular development:**

  -Maturational delay (2 times more in enuretic children)

  -Functional small bladder

  -Low night ADH

  *Enuretics: 2 pg/ml ADH & 50 ml/h urinary excretion during night*

  *Normal children: 3 pg/ml ADH & 22 ml/h urinary excretion during night*

- **Socio-emotional factors (20% of enuresis causes):**

Sibling birth
Hospitalization
School start
New domicile
Family break (divorce, death,…)
Illness
Abuse
Transient regression
…

- Cognitive development
- Toilet training

- **Developmental factors ~ 80% of cases:**
  (causes primary enuresis)

- **Emotional factors ~ 20% of cases:**
  (causes secondary enuresis)
- **Somatic factors ~ 1% of cases:**
  (causes secondary enuresis)

***In secondary enuresis there is a history of 6-12 month dryness***

- **Common comorbid disorders:**

  Developmental delay

  Encopresis

  Sleep disorders

- **Side effects:**

  Poor self-image

  Poor self-esteem

  High embarrassment

  High caregiver's negative response

  Family conflict

  High social restriction

  …

# Assessment

- Primary or secondary
- Rule out somatic factors
- FBS, U/A, U/C, EEG
- Assess comorbidities

# Treatment

- Reassurance, support & open discussion
- Ignoring is prohibited!
- Teasing, embarrassing & punishment is prohibited as well!
- Be persistent, treating enuresis may take a long time, don’t lose your hope!
- Review an appropriate toilet training

- **Treatment of primary enuresis:**

  CBT

  Drug therapy

- **Treatment of secondary enuresis:**

  Treating the basic pathology

  CBT

  Drug therapy

# Cognitive Behavior Therapy (CBT):

- Late fluid & diuretic restriction
- Urination before going to bed
- Midnight urination using midnight alarm
- Bell & pad (50-80% effective)
- Responsible in changing & washing cloths & bed sheets

- High daytime fluid taking & delayed voiding
- Positive reinforcement & star charts

- Tracking (time, place, precipitating factors, …)
- Encouraging the child to cooperate in tracking
- Positive & functional parent-child relationship is necessary for success

# Drug Therapy

- **Imipiramine**

- 25-125 mg/day (up to 5 mg/kg), single dose HS
- Begin with 10-25 mg HS
- If no response: Increase 10-25 mg every 4-7 nights

- Baseline ECG
- Monitor ECG if >3.5 mg/kg is needed

- Lower the symptoms in 85% of cases
- Complete dryness in 30% of cases

- **Desmopressine**

- 10-40 mcg nasal spray
- Begin with 1 puff HS
- If no response: Increase 1 puff every 4-7 nights

- **Minirin** *(Vasopressin)*

- Begin with 0.1-0.2 mg HS
- If no response: Increase 0.1 mg every 4-7 nights (up to 0.4 mg HS)
- If still no response: Add ACH drugs
- T ½: 8 hrs

- Appropriate for primary nocturnal enuresis (PNE)
- 10-90% dryness
- Hyponatremic seizure (fluid & electrolyte control)
- Fluid intake only to satisfy thirst: From 1 hr before until 8 hr after administration
- Test electrolytes every 6 months

- **In drug therapy:**

- Begin tapering after 3 months of dryness
- If reappear at a lower dose: Increase the dose a little & retry tapering after another 3 month of dryness

- **Three types of responders:**

- True responders
- True non responders
- Transient responders

- **Diurnal enuresis due to absorption in play:**

1. Returning home every 15-30 minutes & if dry, will be allowed to continue playing
2. Gradually increasing the checking intervals
3. Going to WC frequently & at fixed times at least every 4 hrs
4. Star chart & positive rewards