

# ELIMINATION DISORDERS

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# NORMAL DEVELOPMENT

- Toddler Phase (18 months-5 years) During toddler phase a child usually becomes interested in mastering elimination .
- Most children have achieved bowel and bladder continence by age 4 & 5 .
- Bowel continence is achieved before bladder continence.
- females achieve continence earlier than males.

# DEFINITION :

- **Elimination disorders** characterized by developmentally **inappropriate** elimination of urine or feces. Though typically involuntary, this may be intentional.
- Includes:
  1. **Enuresis** .
  2. **Encopresis**.



01

# ENURESIS

The act of Involuntary urination; either during the day (diurnal), or at night (nocturnal).

# ENURESIS

## Type of enuresis :

Nocturnal ( $\sigma > \text{♀}$ ) or diurnal ( $\text{♀} > \sigma$ ),

- **Primary Enuresis** : patient never achieved nocturnal continence
- **Secondary Enuresis**: onset of symptoms after patient had achieved nocturnal continence

## Sub-type of enuresis:

- **Monosymptomatic.**
- **Polysymptomatic.**

# ENURESIS

- **Primary Enuresis** :positive [family history](#), can occur as a response to stress (e.g., recent move, [sexual abuse](#), family conflicts)
- **Secondary Enuresis:**
  - Psychosocial stress factors (e.g., problems at school)
  - Psychiatric disorders (e.g., [conduct disorder](#), [generalized anxiety disorder](#)) and [neurodevelopmental disorders](#) (e.g., [ADHD](#), [autism spectrum disorder](#))
  - Obstructive sleep apnea
  - Constipation
  - Chronic kidney disease
  - Urinary tract infection
  - Urinary tract malformation
  - Dysfunctional voiding
  - Diabetes mellitus

## Nocturnal enuresis in children

	Primary	Secondary
<b>Definition</b>	<ul style="list-style-type: none"><li>• Nighttime incontinence at age <math>\geq 5</math> without prior prolonged period of continence</li></ul>	<ul style="list-style-type: none"><li>• Nighttime incontinence at age <math>\geq 5</math> after prolonged period of continence</li></ul>
<b>Causes</b>	<ul style="list-style-type: none"><li>• Brain maturation delay</li><li>• Genetics (eg, family history)</li></ul>	<ul style="list-style-type: none"><li>• Underlying medical condition (eg, UTI, diabetes mellitus)</li><li>• Psychological stressors</li></ul>
<b>Initial evaluation</b>	<ul style="list-style-type: none"><li>• Urinalysis</li></ul>	<ul style="list-style-type: none"><li>• Urinalysis</li></ul>
<b>Management</b>	<ul style="list-style-type: none"><li>• Reassurance</li><li>• Behavioral modifications (eg, evening fluid restriction)</li><li>• Bedwetting alarm</li></ul>	<ul style="list-style-type: none"><li>• Treatment of underlying condition</li><li>• Behavioral modification as in primary enuresis</li></ul>

**UTI** = urinary tract infection.

# RISK FACTORS



Genetic  
predisposition



polyuria

Increased urine  
volume

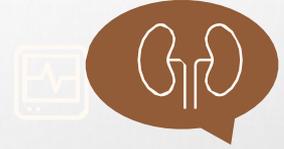


Psychosocial  
factors



PMC inhibition

Inhibition of the  
pontine  
micturition center  
of the brainstem.



local bladder  
dysfunction

UTI, neurogenic  
bladder, Cystitis

## PREVELANCE:

30%  
of children achieve  
continence by age 2

1



15%  
of enuretic children  
have spontaneous  
resolution of  
symptoms each year

2



5-10%  
of 5 year olds meet  
criteria for nocturnal  
enuresis

3



2-3%  
of 12 year olds meet  
criteria for nocturnal  
enuresis

4



1%  
of 18 year olds still  
have enuretic  
symptoms

5

# DIAGNOSTIC CRITERIA

1. Recurrent urination into clothes or bed-wetting.
2. Occurs **two times per week** for at least **3 consecutive months** OR result in clinical distress or marked impairment in social.
3. At least 5 years old developmentally.
4. Not due to a substance (e.g, diuretic) or another medical condition(e.g., UTI, neurogenic bladder, diabetes, spina bifida, seizure disorder),In this case treatment should begin even if the child is under the age 5, through education and behavioral therapy.

# ASSESSMENT:

## 1. **History** : The most important step.

- Child's Age .
- Onset of Symptoms (Primary/Secondary).
- Timing (Nocturnal/Diurnal/Both).
- Frequency.
- Family History.
- Developmental History.

## 2. **Physical examination:**

- It is essential that organic causes of incontinence are ruled out .
- A full pediatric and neurological exam is recommended.
- Spina bifida is also assessed by imaging.

## 3. **Psychiatric assessment:**

- A routine assessment regarding comorbid emotional and behavioral disorders is recommended.
- A validated and standardized parental questionnaire is recommended because of the high frequency of comorbid disorders.

# CONT.



## CONSULT:

### 1. Pediatric Urology:

- Ultrasound of Genitourinary system.
- Voiding Cystourethrogram ( to rule out neurogenic bladder)
- Renal Ultrasound.

### 2. Pediatric Neurology( to rule out seizure)

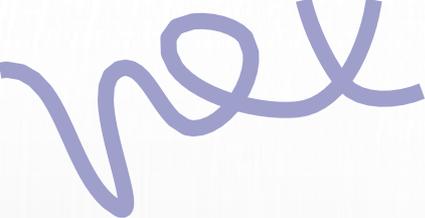
### 3. Sleep Study.



## ASK:

### As a Healthcare provider you should ask about :

- If other family members have had enuresis.
- How often your child urinates during the day.
- How much your child drinks in the evening.
- If your child have had recent stress in their life.



# TREATMENT

- Education.
  - Watchful Waiting.
  - Non-pharmacological Management.
  - Pharmacological Management.
  - Therapeutic Interventions.
- 

# TREATMENT

## 1. Non-Pharmacological Interventions:

### Behavioral Modification:

- Scheduled voiding times (We set specific time for urination)
- Nighttime fluids restriction (We reduce fluid intake at night)
- Using waterproof bed covers.
- Bladder-Volume Alarm.
- Star Chart System .
- Nightlifting ( controversial)
- Timed Night Awakening.
- Bladder Training Exercises/Overlearning



- The child is encouraged to drink large volume of water, and prevent them from going to the bathroom immediately.
- Even if they go, we make them wait a few minutes before urination.

# TREATMENT



## 2. Pharmacological Interventions:

- **Desmopressin (ADH):** One starts with the low dosage of one pill 0.2mg in the evening for two weeks.
  - If the child is dry or a marked reduction of wet nights is documented one stays with this dosage .Otherwise, medication is increased up to 0.4mg
- Imipraminine:**
  - anti-cholinergic side effect
  - Due to high risk for cardiac arrhythmias even with therapeutic doses, a detailed family history, ECG before and during treatment and blood tests are recommended.
- Oxybutynin.**
- NSAIDs(Indomethacin).**

# TREATMENT

## 3. Additional Treatments :

This type of intervention can significantly address secondary enuresis which may be triggered by a psychological stressor as:

- Cognitive Behavioral Therapy .
- Psychodynamic Psychotherapy.
- Biofeedback :This is a form of pelvic floor physical therapy.



Treatment of enuresis is not indicated before 5 years of age, and the condition usually resolves spontaneously.



Enuresis alarm and desmopressin are considered the first-line treatment if behavioral measures are unsuccessful and both are effective for monosymptomatic enuresis.





02

# Encopresis

the repeated passage of **feces** in inappropriate places.  
The voiding is typically regarded as involuntary  
although it may be volitional.

# TYPES

## Primary

- soiling in a child who has never gained bowel continence for six months or more.
- Delayed Physical Maturation .
- Inappropriate Toilet Training.

## Secondary

- soiling in a child who has previously acquired bowel control.
- When secondary encopresis is due to psychological stress(80%) it may be referred to as regressive enuresis.

### Associated with :

- i. Birth of sibling .
- ii. Parental Divorce.
- iii. Abuse.
- iv. Autism / Psychosis.

## Retentive

Encopresis with Constipation and Overflow Incontinence.

-Represents 80-95% of cases.

### Associated with :

- i. Infrequent Bowel Movements
- ii. Large Stools
- iii. Painful Defecation

## Non retentive

Encopresis without Constipation and Overflow Incontinence.

# PREVELANCE AND ETIOLOGY



## Prevelance

- o Secondary encopresis is more common .
- o Between ages 7-8 prevalence is 1.5%
- o 3:1 male to female ratio .
- o Retentive type is 80-95% of cases.



## Etiology

1. Delay in maturation .
2. Underlying medical condition: Psychological/Behavioral constipation .
3. often related to long-term constipation/impaction with overflow incontinence.

# DSM-V DIAGNOSTIC CRITERIA

1. Recurrent defecation into inappropriate places (e.g., clothes, floor).
  2. Occurs at least one time per month for at least 3 months.
  3. At least 4 years old developmentally.
  4. Not due to a substance (e.g., laxatives) or another medical condition (e.g., hypothyroidism, anal fissure, spina bifida) except via a constipation related mechanism.
- An exception to this criterion is encopresis due to overflow incontinence secondary to constipation or stool impaction.
  - A diagnosis of encopresis can be established even if the constipation or stool impaction is caused by another medical condition.

# DIAGNOSIS

Child's age

Onset

primary/secondary

Timing  
/frequency  
day/night

Bowel Habits

frequency, stool size,  
consistency

Melena/  
Hematochezia.

Pain

with Defecation/Fluid  
and Dietary Habits.

Location of  
soiling

# ASSESSMENT:

## 1. THE HISTORY SHOULD FOCUS ON THESE ITEMS:

- DEVELOPMENTAL HISTORY.
- RECENT STRESSORS. (POTTY TRAINING, TRANSITION TO SOLID FOOD, STARTING SCHOOL)
- MENTAL HEALTH -ANXIETY, DEPRESSION,
- MR, AUTISM, ODD, CD)
- CURRENT MEDICATIONS.
- PREVIOUS SURGERIES.
- PAST MEDICAL HISTORY.
- FAMILY HISTORY.
- PREVIOUS TREATMENT FOR ENCOPRESIS.

## 2. Physical examination:

- Abdominal pain/distention
- Height/Weight
- Neurological Examination
- Skin and rectal Examination
- Stool Collection: parasites
- Blood Testing: TSH hypothyroidism
- Rectal Biopsy/Barium Enema
- Abdominal XRAY



# TREATMENT

- ADVICE/EDUCATION.
  - NON-PHARMACOLOGICAL.
  - PHARMACOLOGICAL INTERVENTION.
- 

## TREATMENT

### 3. Advice/Education:

- a. Dietary Changes (foods high in fiber)
- b. Increase Fluid Intake
- c. Make Toilet Training Non-Threatening
- d. Make Toilet Accessible
- e. Regular Bathroom Times



# TREATMENT



## 1. Non-Pharmacological:

1. CBT .
2. Psychodynamic Psychotherapy.



## 2. Pharmacological:

1. Laxatives
2. Mineral Oil
3. Stool Softeners

-If encopresis is due to constipation, treat the underlying constipation with fecal disimpaction, stool softeners, and dietary changes.

## IMPORTANT NOTES:

1. Enuresis: Recurrent urination into clothes or bed-wetting ( $\geq 5$  y)
2. Encopresis: Recurrent defecation into inappropriate places ( $\geq 4$  y)
3. They can cause significant distress or impair social or other areas of functioning.
4. Majority spontaneously remit Prevalence decrease with age.
5. significant genetic factor predisposition .
6. Psycho-education is a key management
7. Desmopressin as first line med.
8. imipramine med can be used for enuresis .



A 7-year-old girl comes to the office with her mother due to "wetting her bed" for the past week. The patient has been dry at night for the past year but has woken up about once a night for the past week because she urinated in the bed. She has no fever, dysuria, hematuria, or changes in bowel movements. There have been no changes in the patient's diet or fluid intake; the family eats dinner at 6:00 PM, with which she has her last glass of milk or juice for the day. The patient goes to bed at 8:30 PM. The patient has no medical conditions and takes no daily medications. Her parents divorced six months ago, and she lives with her mother and older sister. Temperature is 36.7 C (98.1 F), blood pressure is 96/57 mm Hg, and pulse is 70/min. Height and weight are at the 40th percentile. Cardiopulmonary examination is unremarkable. The abdomen is soft and nontender. The external genitalia appear normal with no rashes or excoriations. Which of the following is the best next step in management of this patient?

- A. Obtain a urinalysis
- B. Reassure that this will resolve in a few weeks
- C. Recommend a voiding diary
- D. Recommend restricting evening fluid intake
- E. Suggest a bed enuresis alarm

You are seeing a 4-year-old boy brought to your clinic by his parents because of bedwetting. He had a 2-month period without bedwetting, but began wetting the bed again 6 weeks ago, now occurring about 1–2 times per week. He has not had any daytime urinary incontinence or dysuria. His preschool teachers report that he is attentive and plays well with peers. He is able to name 5 colors, follow three-step commands, recite his address, do a somersault, use scissors, and copy a square. Vital signs are normal. Physical examination is normal. Which one of the following is the most appropriate next step in management?

☰ KEY INFO    ? ATTENDING TIP

✍ ADD NOTES

🚩 MARK

★ GET ANKI CARDS

⋮

- |                         |                             |   |
|-------------------------|-----------------------------|---|
| <input type="radio"/> A | Desmopressin therapy.       | × |
| <input type="radio"/> B | Urinalysis.                 | × |
| <input type="radio"/> C | Bladder training exercises. | × |
| <input type="radio"/> D | Enuresis alarm.             | × |
| <input type="radio"/> E | Reassurance.                | × |

The background features a light gray gradient with several realistic water droplets of various sizes scattered in the corners. The droplets have highlights and shadows, giving them a three-dimensional appearance.

**THANK  
YOU!**