In the treatment of Pediatric Bowel and Bladder Dysfunction (BBD) "the majority of patients will improve with six months of urotherapy ± biofeedback, adequate fluid intake, and constipation treatment". (Dos Santos 2017, Drzewiecki 2012)

- Voiding and bowel diaries are essential for the initial evaluation of BBD
- 7 to 14 day diaries are recommended especially for nocturnal enuresis (Austin 2016)
- 48 to 72 hour frequency volume diaries provide more reliable information
- Most reliable if observed by an adult, or after age 7

Free bladder diary apps (not specific to pediatrics) where reviewed in 2019 by Heidi Moossdorff-Steinhauser PT. Link to her blog post review [https://www.pelvicnewschannel.com/what-is-best-free-bladder-diary-app/](https://www.pelvicnewschannel.com/what-is-best-free-bladder-diary-app/)

Seven outcome questionnaires have been reviewed by Jiang 2018. None perfect. The Dysfunctional Voiding Score System (DVSS) (Farhat 2000) example on my web site

**Fluid input:** amount, time, type
- Great variety of suggested normal
  - Toddlers: 60 to 120 ml
  - 4-8 years: 150 ml
  - 9 -13 years: 210 to 240 ml
- Water is best, Consider irritants and sugar
- Spaced evenly throughout the day, decrease 2 hours before bed

**Urine output:** volume, time
- Maximum voided volume (MVV) should correlate with Expected Bladder Capacity (EBC)
- Expected bladder capacity (EBC)
  - \((\text{age} + 2) \times 34.4 = \text{EBC in ml} \) (Palmer 1977)
    - example for a 5 year old child \((5 + 2) \times 34.4 = 240.8 \text{ ml} = 8 \text{ oz}\)
  - Children over age 2 - (age divided by 2) + 6 = EBC in ounces (Kaefer 1997)
    - example for a 5 year old child \((5/2) + 6 = 8.5 \text{ oz} = 255 \text{ ml}\)
- Some concerns on accuracy
- Can be used up to 12 to 14 years old
- 12 year old should have a bladder capacity of 420 ml
- Small maximum voided volume – less than 65% of EBC
- Large maximum voided volume – more than 150% EBC
- Day time frequency – number of voids during waking hours - between 4 and 8
  - Increased day time frequency – more than 8
  - Decreased day time frequency – 3 or less
- Self - initiated elimination vs parent initiated
  - Child "Do you feel when you need to go?"
  - Parent "Does your child need prompting to void?"
• Nocturia - night time voids after age 5, normal = 0, common in school aged children
• Nocturnal enuresis: frequency, amount, cause
  ▪ Urge at time of leakage
  ▪ Wet clothing
  ▪ Is child aware of urine loss
  ▪ Time of night leak
  ▪ Do you get enough sleep at night?
  ▪ Do you wake up to go to the bathroom at night?
  ▪ Are you afraid of the dark?
• Bowel movements - Bristol stool chart
• Encopresis - bowel leakage
• Protective padding/pull-ups - type, number per day, weight
  o 12-hour pad test (Hellstrom 1986): hard due to parent compliance
  o Weight of wet pad / diaper minus weight of dry pad / diaper

Elimination Observations (Austin 2016)
• Urgency – sudden unexpected need to urinate, after age 5
• Hesitancy – Slow initiation of void after age 5
• Straining – Abdominal pressure during void, all ages
• Intermittency – bursts of urine during voiding, physiological up to age 3 if no straining, after
  3 is always considered dysfunctional "Does the urine come out in a single stream or is it
  interrupted?"
• Feeling of incomplete emptying – relevant from adolescents on
• Post micturition dribble – leak after void, after age 5
• Dysuria - Genital pain – not reliable in children "Are there any signs of pain with voiding or
  bowel movements?" "Do you have pain when you go?"
• Holding maneuvers – strategies to post pone voiding, after age 5 "Does your child exhibit
  holding maneuvers?"
  ▪ Includes – standing on tip toes, crossing legs (St Vincent’s curtsy), and placing heel into
  the perineum (Berry 2005)
  ▪ Children with OAB who use posturing maneuvers to avoid incontinence are at high risk
  for UTIs (Hellerstein 2003)
  ▪ Longstanding postponement of voiding characterized by (Berry 2005)
    o Infrequent and incomplete voiding
    o Little urge to void
    o Larger than normal bladder capacity
    o Underactive bladder with abdominal straining
• Toilet position - Is it a high or low toilet? Feet dangling?
• Patterns during school
  • Does anyone at school (kids) know about your bladder or bowel problem?
  • Do you have enough time to go?
  • Can you go to the bathroom when you need to go at school or do you have to wait until a
    break?
  • Do you feel you have privacy? Do you feel you need more privacy?
Pediatric Urinary Diagnosis

Most frequent subtypes of bladder dysfunction
- Monosymptomatic nocturnal enuresis (MNE)
- Overactive bladder (OAB)
- Dysfunctional voiding (DV)

Nocturnal incontinence - nocturnal enuresis or enuresis or bedwetting
- Primary enuresis
- Secondary enuresis

Overactive Bladder (OAB)
- Urinary urgency and increased urinary frequency with or without UI
- Most common type of pediatric BBD
- UI / Enuresis - Uncontrollable urine leakage from age 5 or attainment of bladder control

Dysfunctional voiding (DV) (Dos Santos 2017)
- “children who contract the urethral sphincter during voiding.”
- Associated with constipation and/or encopresis.
- Staccato uroflow pattern - most common
- Interrupted or mixed flow pattern possible
- Key to perform simultaneous pelvic floor electromyography (EMG) during an uroflow

Vaginal reflux (previously called vesicovaginal entrapment)
- UI of a moderate amount about 20 min after voiding
- Toilet trained, obese, teen aged girls
- Void gets trapped in labia and goes into vagina
- Symptoms include external vaginal irritation and vaginal odor
- Decreased if legs are spread during urination – sit backwards on the toilet

Giggle UI (old term Enuresis Risoria)
- Complete voiding during or immediately after laughing
- Should be differentiated from OAB, Postponement, or underactive bladder
- OAB induced by laughter (Chandra 2002)
- “The emotional change precipitates alteration of PFM tone, causing sudden weakness or paralysis” (cataplexy) (Feldt 2006)
- Often resolves by adulthood (Ellsworth 2008)

Underactive bladder (UB) (Dos Santos 2017)
- Decreased voiding frequency (2–4 times daily)
- Straining during micturition - bend over or push the abdomen
- Symptomatic UTI or asymptomatic bacteriuria
- Dribbling, Enuresis
- Constipation/encopresis
- Interrupted uroflow pattern with a large post-void residual (PVR)
Resources
International Children's Continence Society (ICCS)  http://i-c-c-s.org/
Parent resource  http://i-c-c-s.org/parents/

References


