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Physical Therapy Management of Pediatric Incontinence

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Learning Outcomes

After this course, participants will be able to:

- Define at least two appropriate developmental stages related to the development of continence during day and night.
- Identify at least three treatment options for pediatric patients with incontinence.
- Identify at least two lifestyle adaptations that are likely to be beneficial to pediatric patients with incontinence.
- Identify at least two symptoms consistent with incontinence in the pediatric population.

Pediatric Incontinence-Definitions

- Incontinence: Involuntary leakage of urine (urinary incontinence) or stool (fecal incontinence) in a child who would be expected to be able developmentally to be continent.
- Enuresis-urination
- Nocturnal enuresis-bedwetting or night time involuntary leakage of urine

Scope of the Problem

- Pediatric voiding dysfunction accounts for approximately 40% of visits to pediatric urologists
- Nocturnal enuresis is present in 15-18% of 8 year olds
- Daytime incontinence is present in 15% of 4 year olds and 5% of 9.5 year olds
- Can cause physical and psychosocial issues for children (up to 30% develop emotional/psychiatric disorders as well)

Differential Diagnosis

- Almost all pediatric incontinence has no major underlying medical cause and responds well to conservative treatment
- Red flags
  - Dysuria
  - Genital pain or discharge
  - Straining to urinate
  - Fever/night sweats/chills

Pediatric Pelvic Floor

Developmental Considerations

Continence Development

- Normal urinary frequency
- Bladder capacity: Age(years)+2x30=mL of urine
- Bladder continence developmentally:
  - Infants urinate small amounts each hour (4-6 wet diapers per day)
  - Age of developmental continence varies
    - There is no known correlation between day and night dryness developmentally
  - By age 3 most children urinate around a dozen times day
  - Adult bladder capacity is reached around puberty

Causes of Pediatric B&B Syndromes

- Constipation
- Incomplete relaxation of the pelvic floor with emptying/voiding attempts
- Behavioral-much more common in individuals with ADHD and autism

Medical Management

- Testing
  - KUB test-x ray, can show constipation
  - Uroflow study-assesses amount, speed, pattern of urine flow as well as post void residual-can add PF EMG to assess for PF relaxation during
  - Ultrasound imaging of structures
- Medication-not first line intervention
  - Bowel stimulants
  - Anticholinergics or selective alpha blockers-for overactive bladder
  - Antibiotics for management of UTIs if present

Dysfunctional Voiding

Combination of bowel and bladder symptoms

Pediatric Bowel/Bladder Dysfunction

- Combination of lower urinary tract (LUT) and bowel dysfunction
- Per ICCS, age to diagnose LUT dysfunction is 5 years and bowel dysfunction is 4 years (realizing it is normal for some children to have control younger)

Pediatric Bowel & Bladder Dysfunction

- International Children's Continence Society (ICCS) definitions
  - Overactive bladder-urgency and frequency, may have incontinence
  - Voiding postponement-highly associated with constipation, decreased frequency, high volumes, urgency, can result in daytime incontinence
  - Extraordinary daytime frequency: >8 voids per day which are less than 50% of expected volume; most common in young boys, does not typically include incontinence

Pediatric B&B Dysfunction

- ICCS definitions continued
  - Underactive bladder-infrequent voiding <2-4 times per day with straining; often have large PVR, can be associated with increased UTIs, dribbling, daytime incontinence, constipation
  - Stress incontinence-involuntary leakage of small amounts of urine with changes in intra-abdominal pressure (specific type: giggle incontinence)
  - Vaginal reflux-result of voiding with adducted legs, trapping of urine in introitus ⇨post void dribbling
  - Bladder outlet obstruction-impediment of urine flow during voiding

Pediatric B&B Dysfunction

- ICCS Classifications Continued
  - Bladder neck dysfunction-impaired or delayed opening of the bladder neck after detrusor activation, resulting in decreased flow
  - Dysfunctional voiding-contraction of the urethra during voiding attempts
  - Hinman syndrome-presents like neurogenic bladder in absence of other neurogenic findings
    - Thought to be behavioral/psychosocial
    - Urge incontinence, incomplete voiding, straining, intermittency, UTI, abdominal pain

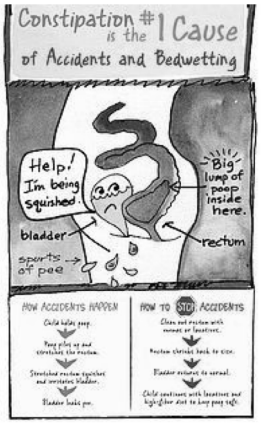
Pediatric B&B Dysfunction

- Pollkaiuria-extreme urinary frequency-children feel an urge as frequently as every 10 minutes, and are urinating very small volumes
- Parents may say
  - "My child doesn't say s/he has to go potty until they are already urinating" (constipation)
  - "My child's underwear are always a little wet" (overflow incontinence, often from constipation

Pediatric Constipation

Constipation

- Underlying issue behind bladder dysfunction in many situations
- Most has no underlying medical cause
- Encopresis is common
- Smaller abdominal cavity=less margin for error
- Lots of underlying social challenges



Courtesy of Dr. Steve Hodges

Constipation

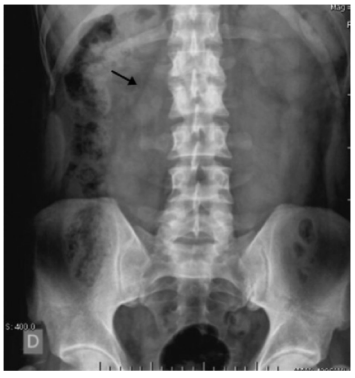
- Multifactorial
  - Dietary
  - "Withholding" after painful bowel movement
  - Social/cultural challenges
    - Especially at school
  - Modern potty training
    - Strongly correlated with early toilet training (toilet training before age 2 triples the risk of constipation)
  - More common in children with sensory processing disorders or who are on the autism spectrum
  - Dyssynergic defecation
  - Overactive pelvic floor (compensating?)

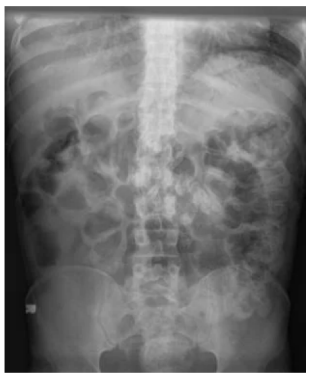
Constipation

- Developmental norms
  - Newborns-4+ liquid bowel movements per day
  - Infants-2-4 soft bowel movements per day (may be more or less in exclusively breastfed infants)
  - By age 2 (on average) children usually have 1-2 formed but not hard bowel movements per day
  - “Rabbit pellets” are never normal
  - Liquid isn’t either

Medical Management

- KUB (kidney ureters bladder) x ray is the gold standard to diagnose constipation





Medical Management

- Osmotic laxatives
  - Polyethylene glycol 3350-Miralax
  - Works by forcing water into the colon via osmosis
  - ONLY WORKS IF THE PATIENT IS ADEQUATELY HYDRATED (hyper hydrated)
  - Not FDA approved for long term use in pediatric patients, but frequently used off label
  - Thought to not be habit forming
  - Some concerns re: neurologic side effects
  - Protocols vary
    - Typically titrate up until stool is consistency of soft serve ice cream and use until there are 2 of this type of bowel movement per day, then taper off

Medical Management

- Enemas
  - Clean out protocols vary
    - MOPs protocol: daily for a month, every other day for a month, 2 times a week for a month
    - More typical to see PRN, once a week, or once a month
  - Can be done inpatient in extreme situations or can be sent home with the parents
  - Should ONLY be done under medical supervision
    - Risks: electrolyte imbalance (can be fatal), dependence, kidney problems, psychosocial concerns

Nocturnal Enuresis

Bedwetting

Bedwetting

- Developmental, not behavioral in most instances
- Cannot be trained
  - Trying to train by waking child in the middle of the night actually teaches them to pee while still asleep
- 100% normal for kids to need longer for night dryness, also normal for parents to feel societal pressure if their kid is not
- Almost always resolves without intervention

It's Normal…

- 16% of 5 year olds are not able to be continent overnight
- By 15, 1-2% have night accidents
- Boys often take longer than girls (on average)
- Most providers don't recommend treatment until the child is 7-9 years old because prior to that it is likely developmental
- 10-25% have bowel issues and daytime continence problems

Causes of Nocturia

- Bladder function issues: Overactive Bladder
- Arousal Disorder: Inability to respond to the body signals that it is time to urinate. Immature sleep pattern.
- "Small for age" bladder volume: Associated with OAB
- Nocturnal Polyuria (Increased Nighttime Urine Production): The brain releases a hormone at night called vasopressin (antidiuretic hormone-ADH) that reduces the amount of urine the kidneys make. With enuresis, there may be a lack of ADH production at night
- Genetics- Half of all children who have this problem had a parent who also struggled with bedwetting. This percent increases to 75% if both parents had enuresis
- Central nervous system development

Nocturia-Red Flags

- Sexual Abuse- May be a factor in children with bedwetting issues who had previously outgrown the issue. Other signs that might point out sexual abuse could be chronic urinary tract infections, discharge due to a sexually transmitted infection, vaginal itching or pain, frequent visits to the school nurse, or bedwetting that resurfaces.
- Sleep apnea (typically from tonsils or adenoids)-may suggest sleep study in children who should developmentally be able to be continent and who are not responding to treatment

Medical Management

- Desmopressin
  - Synthetic analog of arginine vasopressin, the naturally occurring antidiuretic hormone.
  - Reduces the volume of urine produced overnight.
  - Desmopressin has a level 1, grade A recommendation from the International Consultation on Incontinence (ICI) in 2009.
  - 30% fully respond to medication, 40% partial response
  - Drug holiday is needed periodically to see if pt's enuresis is resolved.

Medical Management

- Anticholinergics to suppress detrusor overactivity, oxybutynin, tolterodine, propiverine (grade Ib evidence)
  - Side effects include constipation and increased post void residual (UTIs).
- Tricyclic Antidepressant, imipramine (grade Ia evidence)
  - Third line of therapy due to potentially cardiotoxicity
- Orthodontic widening may help children with wide nasal passages
- Adenotonsillectomy for airway obstruction.

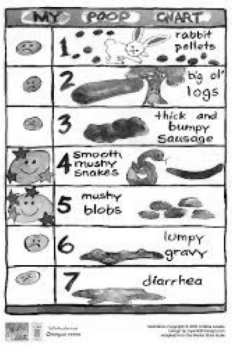
Physical Therapy Evaluation

Evaluation-Subjective

- Symptom behavior
  - When?
  - How much/how often?
  - Any noticed pattern?
- Treatments they have already or are currently trying
- History
  - Procedures (especially abdominal)
  - Delivery age
  - Age at potty training and how potty training was done
  - History of abuse?

Evaluation-Subjective

- Medical history
  - Do they have an illness or are they taking a medication that can cause incontinence or constipation?
- If the child is in school, what are the parameters around potty breaks?
- Sensory issues?
- Bristol stool scale
- Goals and expectations



Courtesy Dr. Hodges

Objective Exam

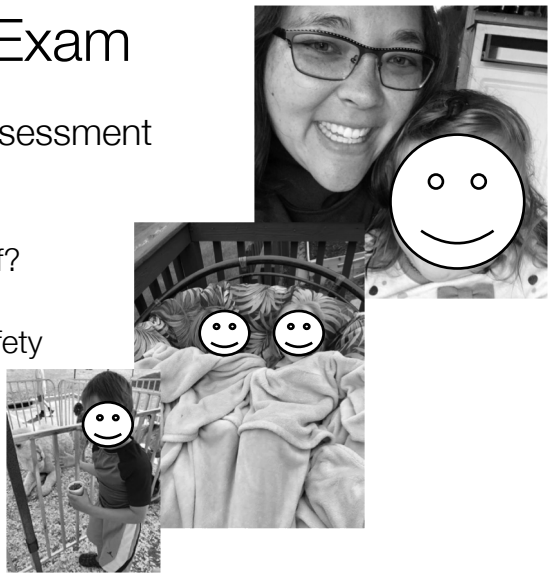
- Joint mobility
  - Spine
  - Hips
  - Pelvis
- Soft tissue
  - Hip flexors
  - Abdomen
  - Hip external rotators
  - Hip abductors
  - Pelvic floor

Objective Exam

- Functional use of muscles
  - Gait analysis
  - Core stabilization ability
  - Single leg stance
  - Balance ability in quadruped, SLS, tandem stance
  - Squat
  - Sit on your hand-if you ask them to replicate pooping, what happens?
    - If that isn't comfortable, could have them sit on a bedside commode with nothing on the bottom and lie underneath to watch

Objective Exam

- Pelvic Floor Assessment
  - Visualization?
  - Palpation?
  - Clothes on/off?
  - When?
  - Promoting safety



Physical Therapy Treatment

Constipation Treatment

The underlying issue in many cases!

Constipation Treatment

- Must be child dependent and based on family abilities and values
- May need to be done in conjunction with medical treatments including enemas and laxatives
- Multiple options, keep trying til you find something that sticks!

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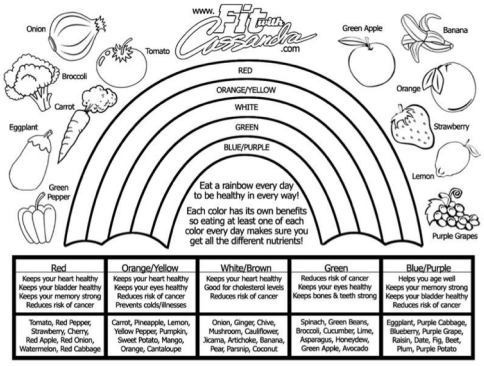
Constipation Treatment

- "Eat the Rainbow"
- White doesn't count
- Considerations: dietary changes are HARD for families and sometimes impossible for kids



Red	Orange/Yellow	White/Brown	Green	Blue/Purple
Keeps your heart healthy Keeps your bladder healthy Keeps your memory strong Reduces risk of cancer	Keeps your heart healthy Keeps your eyes healthy Reduces risk of cancer Prevents colds/illnesses	Keeps your heart healthy Good for cholesterol levels Reduces risk of cancer	Reduces risk of cancer Keeps your eyes healthy Keeps bones & teeth strong	Helps you age well Keeps your memory strong Keeps your bladder healthy Reduces risk of cancer
Tomato, Red Pepper, Strawberry, Cherry, Red Apple, Red Onion, Watermelon, Red Cabbage	Carrot, Pineapple, Lemon, Yellow Pepper, Pumpkin, Sweet Potato, Mango, Orange, Cantaloupe	Onion, Ginger, Chive, Mushroom, Cauliflower, Jicama, Artichoke, Banana, Pear, Parsnip, Coconut	Spinach, Green Beans, Broccoli, Cucumber, Lime, Asparagus, Honeydew, Green Apple, Avocado	Eggplant, Purple Cabbage, Blueberry, Purple Grape, Raisin, Date, Fig, Beet, Plum, Purple Potato

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Constipation Treatment

- DRINK WATER!
  - Fluid timing
  - Also helps with urine concentration
  - May need letter or special water bottle to be able to drink throughout the day at school
  - Pediatric fluid intake needs:
    - Infant up to 10 kg: 100 mL/kg
    - 11-20 kg: 1000 mL + 50 mL/kg for every kg over 10
    - >20 kg: 1500 mL + 20 mL/kg for every kg over 20

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Constipation Treatment

- Toileting timing
  - Can try sitting and attempting (not straining) for 3-5 minutes 15 min or 30 min after meals
  - BUT! Important to teach awareness vs pottying on a cue
- Toileting mechanics
  - Stool or box under feet (if on a potty seat, can put feet on toilet)
  - Open glottis exhale
    - Blowing bubbles
    - Fogging a mirror
    - Playing a kazoo
    - Singing
    - "ZZZ" or "HAAAAHHHH"

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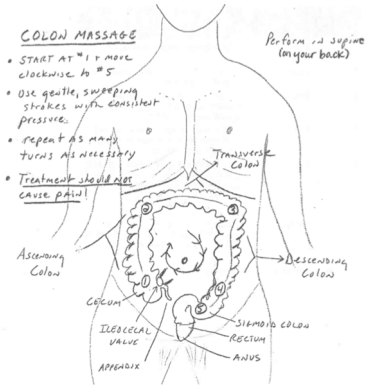
Constipation Treatment

- Abdominal Massage
  - "I love you" massage for clearing the system
  - Peristalsis stimulating massa



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Constipation Treatment

- Supplements
  - Fiber
    - Fiber gummies, psyllium husk, or food
    - Soluble and insoluble fiber
    - Amount needed: age of child in years plus 5 g until age 10 when adult recommendations (25-35 g/day) applies
  - Magnesium
    - Magnesium malate is preferred form (or Epsom salts or magnesium lotion-especially during massage!)
  - Probiotics
    - At least 5 strains, usually refrigerated is better
    - At least 30 billion bacteria

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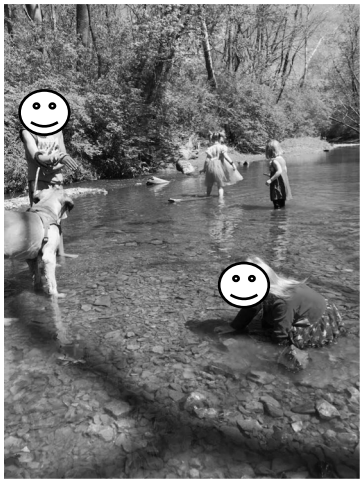
Constipation Treatment

- Stimulate peristalsis
  - Aerobic activity
  - Deep breathing
  - Regularly spaced food
  - Adequate chewing
  - Warm liquids



Treatment

Select based on evaluation results

Breath Work

Breath Work

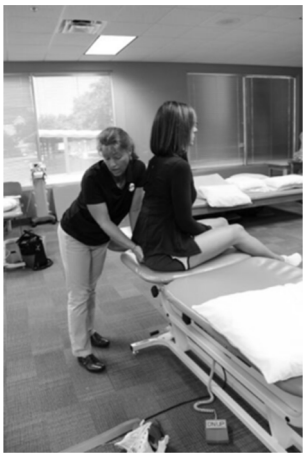
- Pinwheels
- Blowing bubbles
- Fog up a mirror or glass, then draw a picture
- Who can sing the song word longest?

Retrain Dyssynergia

- Visual biofeedback helps a lot if possible
  - EMG, RUSI
- Goal: let diaphragm drop and waist widen while PF relaxes (expulsion comes from bowels and diaphragm)
- Can also give biofeedback verbally with child sitting on your or a parent's hand or (older child) on a physioball
- If you are observing on skin, you can see this also

Coccygeal Movement Test

- Patient in sitting
- Place proximal portion of hand on sacrum with 3rd digit on coccyx
- Have patient attempt to replicate bowel movement
- If it's done correctly, coccyx drops back into hand (vs forward toward pubic bone)



Post Void Dribbling

- "Straddle" toilet
- Sit for a count of 10 (or ABCs or Twinkle Little Star or…) to ensure emptying is complete

Core Strengthening Ideas

- Keep it fun!
- Ball bouncing

Core Strengthening

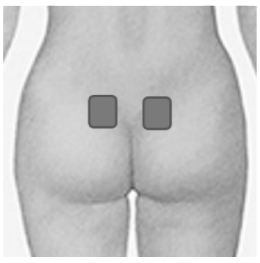
Core Strengthening

Flexibility/Down Training

- Yoga animals (cat/cow, pigeon, etc.)
  - Cosmic Kids Yoga
- Prayer position (deep squat) with deep breaths or playing pat a cake
- "Statues" game

TENs

- Parasacral TENs may promote bladder emptying
  - Reports of 50-70% resolution post TENs for OAB
- 20 minutes twice daily 3 times per week for at least a month
- Pulse width 200
- Pulse rate 10 Hz
- Units available on Amazon

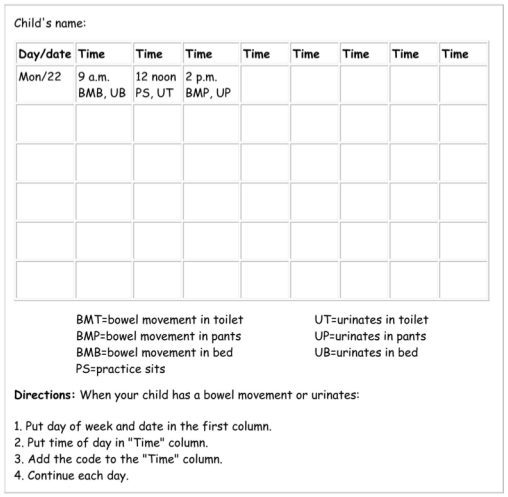


Bed Alarms

- Triggered when a sensor in the sheets or underwear becomes wet, setting off an auditory signal causing the child to wake, potentially cease voiding, and arise to void.
- Parents are advised to wake their child when the alarm is activated—otherwise, children are prone to turn it off and go back to sleep.
- The alarm should be worn every night.
- Response is not immediate and treatment should be continued for 2–3 months or until the child is dry for 14 consecutive nights (whichever comes first).

Intake/Output Journal

- Requires a lot of commitment from the parent but can give helpful insight to possible bladder or bowel irritants



Child's name:

Day/date	Time	Time	Time	Time	Time	Time	Time	Time
Mon/22	9 a.m. BMB, UB	12 noon PS, UT	2 p.m. BMP, UP					

BMT=bowel movement in toilet
BMP=bowel movement in pants
BMB=bowel movement in bed
PS=practice sits

UT=urinates in toilet
UP=urinates in pants
UB=urinates in bed

Directions: When your child has a bowel movement or urinates:

1. Put day of week and date in the first column.
2. Put time of day in "Time" column.
3. Add the code to the "Time" column.
4. Continue each day.

Eliminate Irritants

- No bubble baths (or rinse after bubble baths)
- Wiping education
- Sleeping in no undies
- No soaps on genitals
- May eliminate scented soaps of all kinds (including laundry)

Intake Tips

- Drinking throughout day
- Eliminate caffeine
- Decrease or eliminate sugar in drinks
- May need to work with the schools to allow intake of water AND toileting as needed vs on the school schedule
  - Letters may help, need to include information about this being a medical condition and the child's self esteem being intact

Working with Families

- Reassurance
- Education
- Providing resources
- Empower awareness
  - So they can teach child

Questions?

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