Women’s Health: Urinary Incontinence

K. Rast, MD and E. McNany, MD
3 Types of Incontinence

- **Stress** – caused by sphincter weakness
  - Occurs when intraabdominal pressure is increased (coughing, sneezing, laughing)
  - Most common cause in younger women, 2nd most common in older women

- **Urge** – result of detrusor overactivity
  - Abrupt desire to void accompanied by leakage
  - Sensory Urge – result of local irritation, inflammation or infection
  - Neurologic Urge – loss of cerebral inhibition of detrusor contractions

- **Overflow** – due to impaired detrusor contractility and/or bladder outlet obstruction
  - Results in over distension of the bladder and therefore leakage of urine
3 types of Incontinence

- **Stress**: too little tone
- **Urge**: too much activity
- **Mixed**: too much activity AND too little tone
- **Overflow**: just can't hold any more
3 Incontinence Questions

1. During the last 3 months, have you leaked urine (even a small amount)?
   - Yes  
   - No
   
   Questionnaire completed

2. During the last 3 months, did you leak urine:
   (Check all that apply)
   - a. When you were performing some physical activity, such as coughing, sneezing, lifting, or exercise?
   - b. When you had the urge or the feeling that you needed to empty your bladder, but you could not get to the toilet fast enough?
   - c. Without physical activity and without a sense of urgency?

3. During the last 3 months, did you leak urine most often:
   (Check only one)
   - a. When you were performing some physical activity, such as coughing, sneezing, lifting, or exercise?
   - b. When you had the urge or the feeling that you needed to empty your bladder, but you could not get to the toilet fast enough?
   - c. Without physical activity and without a sense of urgency?
   - d. About equally as often with physical activity as with a sense of urgency?

Definitions of type of urinary incontinence are based on responses to question 3:

<table>
<thead>
<tr>
<th>Response to question 3</th>
<th>Type of Incontinence</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Most often with physical activity</td>
<td>Stress only or stress predominant</td>
</tr>
<tr>
<td>b. Most often with the urge to empty the bladder</td>
<td>Urge only or urge predominant</td>
</tr>
<tr>
<td>c. Without physical activity or sense of urgency</td>
<td>Other cause only or other cause predominant</td>
</tr>
<tr>
<td>d. About equally with physical activity and sense of urgency</td>
<td>Mixed</td>
</tr>
</tbody>
</table>
3 Day Voiding Diary

• As informative as a longer term assessment and has good reliability
• Can serve as a baseline to later assess the effectiveness of treatment
• Examples:
  • Stress incontinence – usually wake once or not at all
  • Urge incontinence – usually wake > 2x/night or as often as every hour

Patient Name:

**Intake & Voiding Diary**
- This chart is a record of your urination, fluid intake, and urine leakage.
- Choose 3 days (entire 24 hours) to complete this record. They DO NOT have to be consecutive days.
- Pick days which will be convenient for you to measure EVERY void (i.e. a day spent at home).
- Bring this diary to your next visit.

**Instructions:**
1. Begin recording as soon as you wake up and continue recording for a full 24 hours.
2. Record separate times for voids, fluid intake, and leaks.
3. Measure voids in ‘cc’s using the hat, jug, or measuring cup.
4. Measure fluid intake in ounces.
5. When recording a leak, please indicate the rating (‘1’ for a few drops or dampness, ‘2’ for more wetness, ‘3’ for bladder emptied), the activity during the leak, and if you had an urge (‘yes’ or ‘no’).

**Example**

<table>
<thead>
<tr>
<th>Time</th>
<th>PM</th>
<th>AM</th>
<th>Voided (in oz/ug)</th>
<th>Fluid Intake</th>
<th>Leaks (didn’t make it to the bathroom)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:30</td>
<td></td>
<td></td>
<td></td>
<td>250 cc</td>
<td>6 oz tea</td>
</tr>
<tr>
<td>6:45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8 oz water</td>
</tr>
<tr>
<td>8:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 running</td>
</tr>
<tr>
<td>8:45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>activity during leak?</td>
</tr>
<tr>
<td>12:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>cough</td>
</tr>
<tr>
<td>12:15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>yes</td>
</tr>
</tbody>
</table>
Cough Stress Test

• Diagnostic of stress incontinence

• Woman stands with a full bladder:
  • Positive test: if urine leaks with onset of cough and terminates with cessation of cough
  • Negative test: no leakage or delayed leakage by 5 – 15 seconds
Diagnostics for the PCP

• Serum creatinine – may be elevated if there is urinary retention
• Urinalysis – to rule out hematuria, proteinuria or glycosuria
• Post void residual – “bladder scan” after emptying bladder
  • PVR < 50 mL is negative for overflow incontinence
  • PVR 100 – 200 mL is indeterminate and should be repeated
  • PVR > 200 mL is suggestive of overflow
    • Indication for urology referral
Management of Incontinence
Management of Urge Incontinence

• **Behavioral treatments:** weight loss, fluid restriction, bladder training, pelvic floor exercises

• **Devices:** neuromodulation devices (posterior tibial nerve stimulator)

• **Medications:**
  • Anticholinergic drugs (ie. Oxybutynin, Tolterodine)
  • Beta-adrenergic agonists (Myrbetriq)
  • Botox injections into the detrusor muscle (lasts 3 – 6 months)
  • Intravaginal estrogen *(NOT FDA approved)*

• **Surgery:** Surgically implanted devices that stimulate the sacral nerve
Management of Stress Incontinence

- **Behavioral treatments:** weight loss, fluid restriction, constipation reduction, pelvic floor exercises

- **Electrical stimulation:** vaginal or anal electrode can be used in women who cannot voluntarily contract pelvic floor muscles.
  - Can be done at home, consists of two 15-minute sessions daily for 12 weeks
  - Medicare approved

- **Devices:** vaginal inserts including pessaries and incontinence tampons (in Europe)

- **Medications:** no medications are FDA approved for SUI
  - Alpha adrenergic agonists should cause urethral constriction and decrease stress incontinence however there is weak evidence to support their use
  - Duloxetine (Cymbalta) has been shown to reduce stress incontinence, but there is no evidence that it generates a cure
Management of Stress Incontinence

- **Minimally invasive procedures:**
  - Radiofrequency denaturation of the urethra (denatures collagen in the bladder neck and proximal urethra, causing a reduction in compliance)
  - Injection of periurethral bulking agents

- **Surgery:**
  - Sling (pubovaginal sling or midurethral sling)
  - Urethropexy (needle urethropexy or retropubic urethropexy)
Question 1
67 year old female presents with urinary incontinence. She reports episodes of an abrupt need to void, accompanied by leakage of urine before she has a chance to get to the bathroom. She does not have leakage of urine with coughing, sneezing, or laughing. She has mild hypertension controlled with Norvasc 5 mg daily. Otherwise she has no medical problems and takes no other medications.

**Which type of incontinence is this?**

**Which interventions are likely to be beneficial for this patient?**

A. Alpha-adrenergic agonists (ie. pseudophedrine or phenylephrine)
B. Beta-adrenergic agonists (ie. mirabegron (Myrbetriq))
C. Pelvic floor exercises
D. Posterior tibial nerve stimulators
E. Retropubic urtheropexy
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Which type of incontinence is this? URGE INCONTINENCE (abrupt desire to void accompanied by involuntary leakage)

Which interventions are likely to be beneficial for this patient?
A. Alpha-adrenergic agonists (ie. pseudophedrine or phenylephrine)
B. Beta-adrenergic agonists (ie. mirabegron (Myrbetriq))
C. Pelvic floor exercises
D. Posterior tibial nerve stimulators
E. Retropubic urtheropexy
Beta-adrenergic agonists

• Mirabegron (Myrbetriq) is a member of a new class of drugs used to treat urge incontinence
• Acts on beta3-adrenergic receptors to relax the detrusor
• Older patient may prefer this because of the side effects of anticholinergics
• Myrbetriq can increase blood pressure!
Pelvic Floor Exercises

• Pelvic floor exercises and bladder training are first line treatment for urge incontinence
• Pelvic floor exercises are also an effective treatment method for stress incontinence
Posterior tibial nerve stimulators

• FDA has approved several different electrical neuromodulation devices for treating urge incontinence that does NOT respond to behavioral interventions

• Percutaneous stimulators of the posterior tibial nerve (which shares a nerve root with the bladder) are the most widely used

• How does it work?
  • Affects the sacral nerve function via the dorsal tibial nerve at the ankle

• Can reduce urge incontinence in up to 75 % of patients!
Alpha-adrenergic agonists

- Such as pseudophedrine and phenylephrine, cause urethral constriction but are NOT indicated for urge incontinence
- Weak evidence to support their use over placebo
Urethropexy

- Surgical procedure to provide support to the urethra for STRESS incontinence
Question 2
Sympathomimetic decongestants such as pseudoephedrine and phenylephrine can be problematic in elderly patients because they can...

A. Decrease blood pressure
B. Cause bradycardia
C. Worsen existing urinary obstruction
D. Enhance the anticholinergic effects of other medications
E. Enhance the sedative effects of other medications
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A. Decrease blood pressure
B. Cause bradycardia
C. **Worsen existing urinary obstruction**
D. Enhance the anticholinergic effects of other medications
E. Enhance the sedative effects of other medications
• Sympathomimetic agents can
  • elevate blood pressure and intraocular pressure
  • worsen existing urinary obstruction
  • adversely interact with beta-blockers, methyldopa, tricyclic antidepressants, oral hypoglycemic agents, and MAOIs
  • speed up the heart rate.

• First-generation antihistaminines can enhance the anticholinergic and sedative effects of other medications
Question 3
A 72-year-old female who remains very active and engaged in the community comes to your office concerned by urinary symptoms that disrupt her life. She reports that she often has a strong, abrupt desire to void that frequently causes her to leak urine involuntarily. She also reports occasional episodes of urinary frequency and nocturia. Which one of the following is the first-line treatment for her condition?

Which type of incontinence is this?

A. Anticholinergic drugs such as oxybutynin or solifenacin (Vesicare)
B. Alpha-Adrenergic agonists such as mirabegron (Myrbetriq)
C. Duloxetine (Cymbalta)
D. Bladder training
E. A pessary
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**Which type of incontinence is this?** URGE INCONTINENCE (abrupt desire to void accompanied by involuntary leakage)

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B. Alpha-Adrenergic agonists such as mirabegron (Myrbetriq)
C. Duloxetine (Cymbalta)
D. **Bladder training**
E. A pessary
• This patient suffers from urge urinary incontinence, defined as the loss of urine accompanied or preceded by a strong impulse to void. It may be accompanied by frequency and nocturia, and is common in older adults.

• Conservative therapies such as behavioral therapy, including bladder training and lifestyle modification, should be the first-line treatment for both stress and urge urinary incontinence (SOR C).

• Pharmacologic interventions should be used as an adjunct to behavioral therapies for refractory urge incontinence (SOR C).

• Vaginal inserts, such as pessaries, can be used for treating stress incontinence but not urge incontinence.
Bonus Question 1
A 22-year-old female has a 4-month history of suprapubic pain, urinary frequency, urinary urgency, dysuria, and dyspareunia. She has been empirically treated with antibiotics for a urinary tract infection despite the fact that multiple urine tests have been negative for infection or other abnormalities. You suspect the patient has interstitial cystitis. Which one of the following would be most appropriate at this point?

A. Fluoxetine (Prozac)
B. Ibuprofen
C. Nitrofurantoin (Macrobid)
D. Pentosan polysulfate sodium (Elmiron)
E. Trimethoprim/sulfamethoxazole (Bactrim, Septra)
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Interstitial Cystitis

• The only FDA-approved oral medication for the treatment of interstitial cystitis is **pentosan polysulfate sodium (Elmiron)**, which is thought to repair the urothelium (SOR B).

• Trimethoprim/sulfamethoxazole and nitrofurantoin are indicated for UTIs, but usually not in cases of cystitis with no infection. In addition, this patient has already received empiric treatment for a UTI despite having multiple negative urine cultures.

• Ibuprofen is an anti-inflammatory medication used to treat pain but is not specifically indicated for interstitial cystitis.

• While tricyclic antidepressants such as amitriptyline have been used to treat interstitial cystitis, fluoxetine is not generally recommended.
Summary
<table>
<thead>
<tr>
<th>Type</th>
<th>Pathophysiology</th>
<th>Symptoms</th>
<th>Patient profile</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Most common</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urge</td>
<td>Detrusor overactivity</td>
<td>Loss of urine accompanied or preceded by strong desire to void; may be accompanied by frequency and nocturia</td>
<td>Most common in older adults Strong association with stroke</td>
</tr>
<tr>
<td></td>
<td>Neurologic disorders</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spinal cord injury</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td>Increased urethral mobility</td>
<td>Loss of urine with physical exertion or increases in intra-abdominal pressure (e.g., sneezing, coughing, laughing)</td>
<td>Most common in younger women Second most common type in older women</td>
</tr>
<tr>
<td></td>
<td>Intrinsic sphincter dysfunction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed</td>
<td>Mixed etiology</td>
<td>Combination of urge and stress symptoms</td>
<td>Overall most common type</td>
</tr>
<tr>
<td><strong>Less common</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overflow</td>
<td>Anatomic obstruction</td>
<td>Dribbling and/or continuous leakage associated with incomplete bladder emptying</td>
<td>Bladder outlet obstruction is uncommon in women More often occurs because of neurologic disorders</td>
</tr>
<tr>
<td></td>
<td>Impaired detrusor contractility from neurologic disorders, including diabetic neuropathy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional</td>
<td>Cognitive, mobility, or psychological impairment</td>
<td>Loss of urine associated with inability to toilet because of impaired cognitive, psychological, or physical function</td>
<td>More often occurs in patients with arthritis, gait disturbance, or dementia</td>
</tr>
<tr>
<td>Type</td>
<td>Conservative management</td>
<td>Pharmacologic</td>
<td>Surgical</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Urge</td>
<td>Weight loss</td>
<td>Anticholinergic drugs</td>
<td>Neuromodulation (implanted sacral nerve</td>
</tr>
<tr>
<td></td>
<td>Fluid reduction</td>
<td>Beta-adrenergic agonists (mirabegron [Myrbetric])</td>
<td>stimulator)</td>
</tr>
<tr>
<td></td>
<td>Constipation management</td>
<td>OnabotulinumtoxinA (Botox)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bladder training</td>
<td>Intravaginal estrogen*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pelvic floor muscle exercises</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electrical stimulation of the posterior tibial nerve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td>Weight loss</td>
<td>Alpha-adrenergic agonists (e.g., pseudoephedrine,</td>
<td>Sling procedures</td>
</tr>
<tr>
<td></td>
<td>Smoking cessation</td>
<td>phenylephrine)*</td>
<td>Suburethral sling with tension-free vaginal</td>
</tr>
<tr>
<td></td>
<td>Fluid reduction</td>
<td>Duloxetine (Cymbalta)*</td>
<td>tape</td>
</tr>
<tr>
<td></td>
<td>Constipation management</td>
<td></td>
<td>Pubovaginal sling</td>
</tr>
<tr>
<td></td>
<td>Pelvic floor muscle exercises (alone or with manual or biofeedback)</td>
<td></td>
<td>Midurethral sling</td>
</tr>
<tr>
<td></td>
<td>Extracorporeal magnetic innervation</td>
<td></td>
<td>Urethropexy</td>
</tr>
<tr>
<td></td>
<td>Electrical stimulation</td>
<td></td>
<td>Needle urethropexy</td>
</tr>
<tr>
<td></td>
<td>Mechanical devices (e.g., pessary, urethral plugs)</td>
<td></td>
<td>Retropubic urethropexy or colposuspension (i.e.,Burch and Marshal-Marchetti-Krantz procedures)</td>
</tr>
<tr>
<td>Mixed</td>
<td>Combination of above treatments with focus on dominant symptoms</td>
<td>Medication focused on dominant symptoms</td>
<td>Periurethral injections of bulking agents</td>
</tr>
<tr>
<td>Overflow</td>
<td>Relief of obstruction</td>
<td>Alpha-adrenergic antagonists or blockers (e.g., tamsulosin [Flomax])</td>
<td>Suprapubic catheter</td>
</tr>
<tr>
<td></td>
<td>Clean intermittent catheterization</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indwelling urethral catheter</td>
<td></td>
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</tr>
</tbody>
</table>

**NOTE:** Treatments are listed in approximate order of priority; clinical judgment required.

*—Not approved by the U.S. Food and Drug Administration for treatment of urinary incontinence.

Information from references 3, 6, 7, and 9 through 12.
References

  • https://www.aafp.org/afp/2013/0415/p543.html

  • https://www.aafp.org/afp/2013/0501/p634.html

• ABFM Intraining Exams 2010 - 2017