Topic review:
Clinical presentation and diagnosis of urinary incontinence in the elderly

Prapa Pattarapornpisut
7 June 2012
Urinary incontinence

**Definition**

- the complaint of any involuntary leakage of urine
Urinary incontinence

Prevalence

• Common condition in the elderly
• Rises with age and with increasing frailty
• any urinary incontinence ~ 35% in old woman and ~ 22% in old man
• Female: male ~ 2:1

Hazzard's Geriatric Medicine and Gerontology, 6th edition
Urinary incontinence


**Prevalence and risk factors of urinary incontinence in Thai menopausal women at Phramongkutklao Hospital.**

Panugthong P, Chulyamitporn T, Tanapat Y.
Department of Obstetrics Gynecology and Family Planning, Petchaboon Hospital.

• Cross section study in healthy woman attended menopausal clinic, completed questionnaire about urinary incontinence.

• Prevalence of urinary incontinence was 75.3%.

• Only 3.6% be treated for symptom.
Urinary incontinence

50 patients assessed by comprehensive geriatric assessment.
70 patients assessed by routine medical assessment.
Prevalence: 24% and 9%, respectively
“often remains undetected and undertreated by health care personnel worldwide despite its substantial impact on patients and health care system.”
Urinary incontinence

Pathophysiology of urination

- centered in the sacral micturition center.

**During normal bladder filling:**

- afferent pathways carry information on bladder volume to the spinal cord.

- sympathetic tone closes the bladder neck and inhibits parasympathetic tone

- somatic innervation maintains tone in the pelvic floor musculature.
Urinary incontinence

Pathophysiology of urination

*During bladder emptying:*
- sympathetic and somatic tones decrease, parasympathetic cause contraction of bladder.

*During normal urination:*
- detrusor muscle contracts -> detrusor pressure increases until exceeds urethral resistance -> urination
- any time during bladder filling, if total bladder pressure exceeds outlet resistance, urinary leakage occurs.
Urinary incontinence

Pathophysiology of urination

- Proper bladder filling and emptying also influenced by higher centers.
- Brainstem: urination
- Cerebral cortex: predominantly inhibitory influence
- Loss of the central cortical inhibitory influences over sacral micturition center
  - For example; stroke can produce incontinence in the elderly.
**Type of Nerve**

A. Parasympathetic Cholinergic (Nervi Erigentes)
   - Function: Bladder contraction

B. Sympathetic
   - Function: Bladder relaxation (by inhibition of parasympathetic tone)

C. Sympathetic
   - Function: Bladder relaxation (\( \beta \)-adrenergic)

D. Sympathetic
   - Function: Bladder neck and urethral contraction (\( \alpha \)-adrenergic)

E. Somatic (Pudendal nerve)
   - Function: Contraction of pelvic floor musculature

Urinary incontinence

Classification

• Acute incontinence
• Persistence incontinence
Urinary incontinence

Classification

- **Acute incontinence:**
  - "transient incontinence"
  - "functional incontinence"
  - "incontinence related to potentially reversible conditions"

- sudden onset, usually related to an acute illness or an iatrogenic problem
- subsides once the problem has been resolved.
<table>
<thead>
<tr>
<th>CONDITION</th>
<th>MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions affecting the lower urinary tract</td>
<td></td>
</tr>
<tr>
<td>Urinary tract infection (symptomatic with frequency, urgency, dysuria, etc.)</td>
<td>Antimicrobial therapy (not for asymptomatic bacteriuria)</td>
</tr>
<tr>
<td>Atrophic vaginitis/urethritis</td>
<td>Topical estrogen</td>
</tr>
<tr>
<td>Postprostatectomy (incontinence will often resolve during first yr)</td>
<td>Behavioral interventions&lt;br&gt;Avoid further surgical therapy until it is clear condition will not resolve</td>
</tr>
<tr>
<td>Stool impaction</td>
<td>Disimpaction; appropriate use of stool softeners, bulk-forming agents, and laxatives if necessary; implement high fiber intake, adequate mobility and fluid intake</td>
</tr>
<tr>
<td>Drug side effects (see Table 59-4)</td>
<td></td>
</tr>
<tr>
<td>Increased urine production</td>
<td></td>
</tr>
<tr>
<td>Metabolic (hyperglycemia, hypercalcemia)</td>
<td>Better control of diabetes mellitus; therapy for hypercalcemia depends on underlying cause</td>
</tr>
<tr>
<td>Excess fluid intake</td>
<td>Reduction in intake of diuretic fluids (e.g., caffeinated beverages)</td>
</tr>
<tr>
<td>Volume overload</td>
<td></td>
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<tr>
<td>CONDITION</td>
<td>MANAGEMENT</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>Medical therapy</td>
</tr>
<tr>
<td>Impaired ability or willingness to reach a toilet</td>
<td></td>
</tr>
<tr>
<td>Delirium</td>
<td>Diagnosis and treatment of underlying cause(s) delirium (see Chapter 53)</td>
</tr>
<tr>
<td>Chronic illness, injury, or restraint that interferes</td>
<td></td>
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<tr>
<td>with mobility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regular toileting</td>
</tr>
<tr>
<td></td>
<td>Use of toilet substitutes</td>
</tr>
<tr>
<td></td>
<td>Environmental alterations (e.g., bedside commode, urinal)</td>
</tr>
<tr>
<td>Psychological</td>
<td>Remove restraints if possible</td>
</tr>
<tr>
<td></td>
<td>Appropriate pharmacologic and/or nonpharmacologic treatment</td>
</tr>
</tbody>
</table>

**Hazzard's Geriatric Medicine and Gerontology, 6th edition**
### Medication that may cause urinary incontinence

<table>
<thead>
<tr>
<th>TYPE OF MEDICATION</th>
<th>POTENTIAL EFFECTS ON CONTINENCE</th>
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</thead>
<tbody>
<tr>
<td>Diuretics</td>
<td>Polyuria, frequency, urgency</td>
</tr>
<tr>
<td>Anticholinergics</td>
<td>Urinary retention, overflow incontinence, stool impaction</td>
</tr>
<tr>
<td>Psychotropics</td>
<td></td>
</tr>
<tr>
<td>Antidepressants</td>
<td>Anticholinergic actions, sedation</td>
</tr>
<tr>
<td>Antipsychotics</td>
<td>Anticholinergic actions, sedation, immobility</td>
</tr>
<tr>
<td>Sedative–hypnotics</td>
<td>Sedation, delirium, immobility, urethral muscle relaxation</td>
</tr>
<tr>
<td>Narcotic analgesics</td>
<td>Urinary retention, fecal impaction, sedation, delirium</td>
</tr>
<tr>
<td>Calcium channel-blockers</td>
<td>May contribute to urinary retention</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Polyuria, frequency, urgency, sedation, delirium, immobility</td>
</tr>
</tbody>
</table>

*Hazzard's Geriatric Medicine and Gerontology, 6th edition*
Management of Urinary Incontinence in Frail Older Persons

**HISTORY/SYMPOM ASSESSMENT**

**CLINICAL ASSESSMENT**

- Delirium
- Infection
- Psychological
- Excess urine output
- Reduced Mobility
- Stool impaction and other factors
  Avoid overtreatment of asymptomatic bacteriuria

**Active Case Finding in Frail Elderly**

- Assess, treat and reassess potentially treatable conditions, including relevant comorbidities and ADLs (see text)
- Assess Qol, desire for Rx, goals for Rx, pt & caregiver preference
- Targeted physical exam including cognition, mobility, neurological and rectal exams
- Urinalysis
- Consider frequency volume chart or wet checks, especially if nocturia present

**URGENCY UI**

**SIGNIFICANT PVR**

**STRESS UI**

UI associated with:
- Pain
- Haematuria
- Recurrent symptomatic UTI
- Pelvic mass
- Pelvic irradiation
- Pelvic / LUT surgery
- Prolapse beyond hymen (women)
- Suspected fistula

* Other


DIPPERS
Urinary incontinence

Classification

- **Persistence incontinence:** (incontinence unrelated to acute illness and persists over time)

- Stress incontinence
- Urge incontinence
- Overflow incontinence
- Mixed (stress & urge) incontinence
Persistent urinary incontinence

Classification

**Stress incontinence**
Involuntary loss of urine with increases in intraabdominal pressure; cough, laugh, exercise in the absence of bladder contraction

- Usually small amounts
- Common in elderly women associated with weakened pelvic floor muscle, poor intrinsic sphincter function, increased urethral hypermobility and lack of estrogen.
- Obesity, previous vaginal deliveries, surgery
- Unusual in men, mainly occurs following transurethral surgery (Postprostatectomy)
Persistent urinary incontinence

Classification

**Urge incontinence**
Leakage of urine because of inability to delay voiding after sensation of bladder fullness is perceived.

- sudden strong desire to void -> fear of leakage > urine loss
- variable but often large volumes
- Detrusor hyperactivity with or without 1 or more of the following:
  - Local genitourinary condition; tumors, stones
  - CNS disorders; stroke, dementia, parkinsonism, spinal cord injury
Persistent urinary incontinence

Classification

**Overactive bladder:**
- syndrome: urgency, frequency, and nocturia with or without urge incontinence.
- not a specific pathological condition

**Mixed incontinence**
combination of urge and stress incontinence
Persistent urinary incontinence

Classification

Overflow incontinence
Dribbling/ continuous leakage associated with incomplete bladder emptying due to impaired detrusor contractility /bladder outlet obstruction.

"incomplete bladder emptying”
“incontinence with a high post-void residual”

- Bladder outlet obstruction (anotomic or functional): BPH, urethral stricture, drugs
- Hypotonic or acontractile bladder: spinal cord injury, DM
- Detrusor–sphincter dyssynergy: multiple sclerosis, suprasacral spinal cord lesions
Persistent urinary incontinence

- Stress, urge and mixed incontinence are the most common types among women.

- Prominent type in younger women: Stress incontinence \( \sim 50\%-66\% \)

- Woman \( > 65 \) years: stress incontinence \( \sim 25\%-33\% \), increasing prevalence of urge incontinence.

*JAMA.* 2008;299(12):1446-1456
Urinary incontinence

**Screening**

- many are embarrassed to discuss about incontinence.
- not aware that treatment is available.
- essential to add questions about incontinence in periodic assessments.
- incorporated into health care quality process measures in the US.
Table 59-1 Asking About Urinary Incontinence

Questions about incontinence should be open-ended and phrased in language easily understood by the patient:

"Tell me about any problems you are having with your bladder?"

"Tell me about any trouble you are having holding your urine (water)?"

If the responses to the above questions are negative, following up with questions may be helpful:

"How often do you lose urine when you don't want to?"

"How often do you wear a pad or other protective device to prevent urinary accidents?"

ICIQ: A Brief and Robust Measure for Evaluating the Symptoms and Impact of Urinary Incontinence

Kerry Avery, Jenny Donovan, Tim J. Peters, Christine Shaw, Momokazu Gotoh, and Paul Abrams

1Bristol Urological Institute, Southmead Hospital, Bristol, United Kingdom
2Department of Social Medicine, University of Bristol, United Kingdom
3Division of Primary Health Care, University of Bristol, United Kingdom
4Department of General Practice, University of Wales College of Medicine, United Kingdom
5Department of Urology, Nagoya University School of Medicine, Japan
Questionnaire to assess urinary incontinence and its impact to quality of life

• Easily completed.

• Low level of missing data

• Possible to combine items into a single summed score (0-21)
Diagnostic evaluation

- History
- Physical examination
- Laboratory test
- Clinical testing
Diagnostic evaluation: History

- Onset, course, associated lower urinary tract symptoms.
  - occur suddenly, without UTI symptoms, may indicate neurological causes

- Leakage frequency, volume, timing, and associated symptoms
  - urgency, urinary frequency, nocturia, hesitancy, interrupted voiding, incomplete emptying, straining to empty

- Severity

- Precipitating cause: caffeine, alcohol, physical activity, cough
Diagnostic evaluation: History

- Bowel and sexual function (share the same sacral cord innervation)
  - fecal incontinence is more common in people with urinary incontinence.

- other medical condition, surgery, parity, medications with temporal relationship to urinary incontinence onset or worsening
  - stroke of several years' duration is unlikely to be responsible for new onset urinary incontinence
Diagnostic evaluation: History

The Sensitivity and Specificity of a Simple Test To Distinguish between Urge and Stress Urinary Incontinence

Jeanette S. Brown, MD, Catherine S. Bradley, MD, MSCE, Leslee L. Subak, MD, Holly E. Richter, MD, PhD, Stephen R. Kraus, MD, Linda Brubaker, MD, MS, Feng Lin, MS, Eric Vittinghoff, PhD, and Deborah Grady, MD, MPH

For the Diagnostic Aspects of Incontinence Study (DAISy) Research Group From the University of California, San Francisco, and San Francisco Veterans Affairs Medical Center, San Francisco, California; University of Iowa, Iowa City, Iowa; University of Alabama at Birmingham, Birmingham, Alabama; University of Texas Health Science Center at San Antonio, San Antonio, Texas; and Loyola University of Chicago, Maywood, Illinois.

Urge incontinence: sensitivity 75% and specificity 77%
Stress incontinence: sensitivity 86%, specificity 60%
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>

Figure 1.
The 3 Incontinence Questions (3IQ).
### Table 1
Characteristics of 301 Participants in the Diagnostic Aspects of Incontinence Study (DAISy)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD) age, y</td>
<td>56.4 (11.4)</td>
</tr>
<tr>
<td>Race or ethnicity, n (%)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>207 (68.8)</td>
</tr>
<tr>
<td>African American</td>
<td>38 (12.6)</td>
</tr>
<tr>
<td>Latina</td>
<td>36 (12.0)</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
<td>7 (2.3)</td>
</tr>
<tr>
<td>Native American or other</td>
<td>13 (4.3)</td>
</tr>
<tr>
<td>Education, n (%)</td>
<td></td>
</tr>
<tr>
<td>≤High school</td>
<td>65 (21.9)</td>
</tr>
<tr>
<td>Some college or bachelor’s degree</td>
<td>177 (59.6)</td>
</tr>
<tr>
<td>Graduate degree</td>
<td>55 (18.5)</td>
</tr>
<tr>
<td>Parity, n (%)</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>17 (6.4)</td>
</tr>
<tr>
<td>1-2</td>
<td>139 (52.3)</td>
</tr>
<tr>
<td>3-4</td>
<td>86 (32.3)</td>
</tr>
<tr>
<td>&gt;4</td>
<td>24 (9.0)</td>
</tr>
<tr>
<td>Postmenopausal, n (%)</td>
<td>98 (32.7)</td>
</tr>
</tbody>
</table>
Diagnostic evaluation: History

The Rational Clinical Examination | March 26, 2008

What Type of Urinary Incontinence Does This Woman Have?

Jayna M. Holroyd-Leduc, MD; Cara Tannenbaum, MD, MSc; Kevin E. Thorpe, MMath; Sharon E. Straus, MD, MSc

Classifying type from symptom

Urgency symptom

"Do you experience such a strong and sudden urge to void that you leak before reaching the toilet?"

• sensitive and specific for the diagnosis of urge incontinence
Diagnostic evaluation: History

**Leakage with stress maneuvers** (coughing, laughing, running etc.)
- highly sensitive but has lower specificity
- "Stress" leakage can occur in detrusor overactivity, Detrusor hyperactivity with impaired contractibility (DHIC), incomplete bladder emptying.

**Frequency, nocturia, slow urine stream, hesitancy, interrupted voiding, straining, and terminal dribbling**
- lack diagnostic specificity and may occur with detrusor overactivity, DHIC, outlet obstruction, detrusor underactivity, fluid intake, medications and many medical conditions.
Diagnostic evaluation: History

Bladder diary (frequency-volume charts)

- reproducible and reliable measure of incontinence frequency before and after treatment

- Greatest reliability with 7-day diaries, but 2-3 day diaries are commonly used in both clinical and research settings.

- record the time and volume of every continent and incontinent void over at least 48 to 72 hours, pertinent associated activities (eg, coffee drinking, exercise) and hours of sleep.

- Urinary incontinence volumes can be estimated as drops, small, medium, and soaking.
Diagnostic evaluation: History

**Bladder diary (frequency-volume charts)**

- Frequency and volume are neither sensitive nor specific for determining urodynamic cause of incontinence.

- Specific situations: diaries can be clinically helpful
  - Nocturia:
    - Intrinsic problem (e.g. detrusor overactivity) vs nocturnal polyuria
  - High urinary frequency and/or incontinence frequency
    - Confirm frequent urination or leakage
    - Assess whether frequency is associated with high urine output (e.g. high fluid intake or diabetes insipidus).
  - Unclear history
### Your Daily Bladder Diary

This diary will help you and your health care team. Bladder diaries help show the causes of bladder control trouble. The "sample" line (below) will show you how to use the diary.

<table>
<thead>
<tr>
<th>Time</th>
<th>Drinks</th>
<th>Urine</th>
<th>Accidental leeks</th>
<th>Did you feel a strong urge to go?</th>
<th>What were you doing at the time?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
<td>Lobelia 2 cups</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6-7 a.m.</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>7-8 a.m.</td>
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<tr>
<td>8-9 a.m.</td>
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<tr>
<td>9-10 a.m.</td>
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<tr>
<td>10-11 a.m.</td>
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<tr>
<td>11-12 noon</td>
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<tr>
<td>12-1 p.m.</td>
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<tr>
<td>1-2 p.m.</td>
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<td>2-3 p.m.</td>
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<td>3-4 p.m.</td>
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<td>4-5 p.m.</td>
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<td>5-6 p.m.</td>
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</tr>
<tr>
<td>6-7 p.m.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Your name:*

*Date:*
Bladder Diary
By Zephо Inc
Open iTunes to buy and dow
Diagnostic evaluation

Physical examination

- Abdomen: insensitive for elevated postvoid residual
gross bladder distention (e.g., 500 mL); superior margin often identified by palpation or percussion

- PV: inspection for significant prolapse
  signs of inflammation: atrophic vaginitis
  cough test: stress incontinence

- PR: prostate size and detect prostate cancer.
Diagnostic evaluation

Physical examination

- CVS: evidence of volume overload; fine crepitation, leg edema
- Detailed neurologic examination: considered in sudden onset known neurological disease new onset of neurological symptoms
- screening for depression, evaluation of cognitive function.
Diagnostic evaluation

**Laboratory test**

**Urinalysis:**
- all patients
- signs of infection, hematuria, glucosuria
- older women, high prevalence of asymptomatic bacteriuria
- relationship between asymptomatic bacteriuria and incontinence is controversial.
- if difficult to differentiate -> reasonable to treat bacteriuria and observe response on incontinence
Diagnostic evaluation

**Laboratory test**

- not recommend routine test for renal function
- Serum calcium and glucose may be considered in patients with frequency and/or an increased urine volume.
Diagnostic evaluation

Clinical testing

Stress test: in women

- ask patient with full bladder to stand or in lithotomy position.
- single vigorous cough
- Clinician observes leakage from urethra.
- Leakage instantaneous with cough -> stress incontinence
- delayed leakage -> cough-induced detrusor overactivity, especially if large volume leakage difficult to stop.
- negative test: may result from a small urine volume in the bladder or patient inhibition.
Diagnostic evaluation

Clinical testing

Pad test

• Continuous wearing of pads for a period of time

• Check abnormal increase in pad weight.

• Help to make general diagnosis of urinary incontinence.
Diagnostic evaluation

Clinical testing

Postvoid residual volume (PVR):

- 4\textsuperscript{th} International Consultation on Incontinence recommends as part of initial evaluation.

- Expert opinion suggests that a PVR should be performed in patient with higher risk for an elevated PVR: DM, neurological disorder

- catheterization or ultrasound

- < 50 mL: adequate emptying
- >200 mL: inadequate, suggestive of detrusor weakness or obstruction
Initial Evaluation
- Focused history
- Targeted physical examination
- Urinalysis
- Postvoid residual

Reversible factors identified? (see Table 59-3)
- Yes: Treat
  - Still incontinent
- No

Indication for further evaluation? (Table 59-7)
- Yes: Further Evaluation
  - Urologic
  - Gynecologic
  - Urodynamic
- No: Therapeutic Trial
  - Behavioral and/or drug therapy for stress, urge, mixed incontinence
  - Behavioral and supportive measures for functional incontinence

Is incontinence persistent despite adequate therapeutic trial in a patient who is appropriate for further evaluation?
Management of Urinary Incontinence in Frail Older Persons

**Active Case Finding in Frail Elderly**
- Assess, treat and reassess potentially treatable conditions, including relevant comorbidities and ADLs (see text)
- Assess QoL, desire for Rx, goals for Rx, pt & caregiver preference
- Targeted physical exam including cognition, mobility, neurological and rectal exams
- Urinalysis
  - Consider frequency volume chart or wet checks, especially if nocturia present

**URGENCY UI***
- Lifestyle interventions
  - Behavioral therapies
  - Consider addition and trial of antimuscarinic drug

**SIGNIFICANT PVR***
- Treat constipation
  - Review medications
  - Consider trial of alpha-blocker (men)
  - Catheter drainage if PVR 200-500 ml, then reassess (see text)

**STRESS UI***
- Lifestyle interventions
  - Pelvic floor muscle exercises

**INITIAL MANAGEMENT**
- If insufficient improvement, reassess for treatment of contributing comorbidity ± functional impairment

**ONGOING MANAGEMENT and REASSESSMENT**
- If continued insufficient improvement, or severe associated symptoms are present, consider specialist referral as appropriate per patient preferences and comorbidity (see text)

*These diagnoses may overlap in various combinations, e.g., Mixed UI, DHIC (see text)

UI associated with:
- Pain
- Haematuria
- Recurrent symptomatic UTI
- Pelvic mass
- Pelvic irradiation
- Pelvic / LUT surgery
- Prolapse beyond hymen (women)
- Suspected fistula

Other
Thank you for your attention