Geriatric Giants Lecture Series:

Urinary incontinence
Learning objectives

To demonstrate an understanding of:

• definition of urinary incontinence
• physiological control of the micturition cycle
• changes in lower urinary tract associated with ageing
• prevalence & impact
• underlying causes of incontinence
• evidence informed management
Definition

Urinary incontinence is:

“the complaint of any involuntary leakage of urine”

which should be further described by describing type, frequency, severity, precipitating factors, effect on quality of life, and whether the person wishes treatment for the condition

## Lower urinary tract symptoms (LUTS)

<table>
<thead>
<tr>
<th>Storage</th>
<th>Voiding</th>
<th>Post micturition</th>
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<tbody>
<tr>
<td>Frequency</td>
<td>Slow stream</td>
<td>Incomplete emptying</td>
</tr>
<tr>
<td>Nocturia</td>
<td>Splitting or spraying</td>
<td>Post micturition dribble</td>
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<tr>
<td>Enuresis</td>
<td>Intermittency</td>
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<tr>
<td>Urgency</td>
<td>Hesitancy</td>
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<tr>
<td>Urgency incontinence</td>
<td>Straining</td>
<td></td>
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<tr>
<td>Stress UI</td>
<td>Terminal dribble</td>
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<tr>
<td>Mixed incontinence</td>
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<tr>
<td>Continuous UI</td>
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Prevalence of storage symptoms in women in association with age

Prevalence of storage symptoms in men in association with age

Prevalence of voiding symptoms by age and sex

**Women**

- Intermittency
- Slow stream
- Straining
- Terminal dribble

**Men**

- Intermittency
- Slow stream
- Straining
- Terminal dribble

Age groups:
- ≤39
- 40-59
- ≥60
Older people generally experience more severe incontinence than the young.
Men

Prevalence %

Monthly and slight
Monthly and damp
Monthly and wet
Monthly and soaked

Prevalence in Care Homes

Prevalence of urinary incontinence by age

<table>
<thead>
<tr>
<th>Age group</th>
<th>% Incontinent</th>
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<tbody>
<tr>
<td>40-44</td>
<td>10</td>
</tr>
<tr>
<td>45-49</td>
<td>15</td>
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<tr>
<td>50-54</td>
<td>20</td>
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<tr>
<td>55-59</td>
<td>25</td>
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<tr>
<td>60-64</td>
<td>30</td>
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<td>65-69</td>
<td>35</td>
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<tr>
<td>70-74</td>
<td>40</td>
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<td>75-79</td>
<td>45</td>
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<tr>
<td>80-84</td>
<td>50</td>
</tr>
<tr>
<td>85+</td>
<td>55</td>
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</tbody>
</table>

- Non-institutionalised
- Institutional resident
- All community
Impact

Clinical
- falls, restricted mobility
- urinary tract infection
- skin health
- inappropriate catheter usage

Psychological
- isolation, depression
- embarrassment, loss of self-esteem
- negative impact on quality of life
- caregiver burden
Cost

- Nursing home admissions
- Healthcare costs
  - £473m (2001 UK),
  - $20b US (direct costs - 2004)

- Social / personal

- Caregiver
Physiological control of micturition

- **CNS**
  - Inhibition and facilitation of voiding

- **Sympathetic nervous system**
  - (α-adrenergic fibers)
  - Smooth muscle sphincter contraction and relaxation

- **Parasympathetic nervous system**
  - (cholinergic fibers)
  - Detrusor contraction and relaxation

- **Somatic nervous system**
  - Striated muscle sphincter contraction and relaxation
Alterations in lower urinary tract function associated with increased age

- Bladder capacity
- Sensation of filling
- Speed of contraction of detrusor
- Pelvic floor muscle bulk & tone
- Sphincteric “resistance”
- Urinary flow rate

- Urinary frequency
- Prevalence of post void residual volumes
- Outflow tract obstruction (♂)
Maximum bladder capacity by decade of life
(median and 95% CI)

Contractile function in association with greater age

Age-related fall in women $p<0.001$, men $p=0.17$

$n$ (women) = 844, men = 157
Bladder capacity at first desire to void as a proportion of maximum bladder capacity in association with age.
Median maximum flow rate for men and women in relation to age

Women and men, $p<0.001$
Residual volumes

Urge in older men

The interval was (median and 95%CI) 5 (4 – 5) and 3 (3 – 5) minutes in older men. The intervals were statistically significantly different (W=31294.5, p<0.0001)
Loss of striated muscle cells in association with greater age

Maximum urethral closure pressure is lower in association with greater age

No incontinence

stress urinary incontinence

r = -0.4, p = 0.03
From Haubensak 1975

Resting urethral pressure with age and sex, measured by UPP

Decade of life

Urethral pressure (mmHg)

males

females
Clinically defined
- urinary urgency
- +/- urinary frequency (>8 voids/ day)
- +/- presence of urge incontinence

Only 1/3 of the OAB population is incontinent
The key feature is urgency

Exclude other LUT causes
Detrusor Overactivity

- Diagnosed by observation of involuntary detrusor contractions during filling phase of cystometrogram which may be spontaneous or provoked

ICS 2002
Intravesical pressure

Rectal pressure

Detrusor pressure

Volume infused
Stress urinary incontinence

- **Symptom:**
  “The complaint of involuntary leakage on effort or exertion, or on sneezing and coughing.”

- **Sign:**
  “The observation of involuntary leakage from the urethra, synchronous with exertion/effort, sneezing or coughing.”
Urodynamic stress incontinence

- Noted during filling cystometry – defined as the involuntary leakage of urine during increased abdominal pressure in the absence of a detrusor contraction
Mixed urinary incontinence

• The complaint of involuntary leakage associated with urgency and also with exertion, effort, sneezing or coughing

• There is difficulty with the definition – is it merely a combination of urgency & SI, or SI + urgency incontinence

• Women with pure SUI may complain of “urgency”
Functional incontinence

- NO lower urinary tract disease
- Cognitive, behavioural or physical impairment leads to UI
Overflow incontinence – continuous leakage
Of women presenting for care:

1070 women either receiving or presenting for UI care in UK/RoI 2004 (Wagg 2005)
Assessing the patient

- History
- Examination
- Initial management
Assessing the patient

Storage symptoms
- Nocturia
- Increased daytime frequency
- Urgency
- Urgency incontinence

Voiding symptoms
- Slow stream
- Splitting
- Hesitancy
- Intermittency
- Terminal dribble
- Straining

Post micturition symptoms
- Incomplete bladder emptying
- Post micturition dribble
Additional history

- Sense of prolapse
- Previous surgery
- Urinary tract infection
- Parity and mode of delivery
- Vaginal symptoms
- Bowel habit and constipation
- Medications
Drugs and Incontinence

- Diuretics
- Calcium channel antagonists
- Antimuscarinics (incl. antihistamines, antipsychotics, antispasmodics, anti-parkinsonian agents)
- Clozapine
- Alpha-adrenoreceptor antagonists
- Non Steroidal Anti-Inflammatory Drugs
- H$_2$ antagonists
- Benzodiazepines and antipsychotics
- SSRIs
- ACE inhibitors
- Lithium
- Cholinesterase inhibitors
- Systemic HRT
Assessment

• History
  – Storage symptoms
  – Voiding symptoms
  – Co-morbidity
  – Gynaecological / obstetric / urological history
  – Bother
  – Expectations and aims of treatment

• Assessment
  – Toileting ability
  – Cognition
  – Reversible causes
Red flags

• **Pain**
  – Exclude acute cystitis

• **Haematuria**
  – Macroscopic (refer)
  – Dipstick microscopic (validate before referral)
Reversible causes of UI

- D: delirium
- I: infection
- P: pharmaceuticals
- P: psychological
- E: excess urine output
- R: reduced mobility
- S: stool impaction
For women c/o voiding Sx
For all men
Rule out significant voiding inefficiency leading to retention of urine.
Infection:

- Treat if thought to be significant
- No effect of treating “UTI” in people with chronic UI
- 20% asymptomatic bacteruria
- Symptoms should guide treatment
The digital rectal examination

- For men: assessment of prostate size will guide medical therapy (+/- 5-ARA)
- For all:
  - Exclusion of faecal loading
Urogenital atrophy

- loss of labial and vulvar fullness
- pallor of urethral and vaginal epithelium
- decreased vaginal moisture
Prolapse

- Associated prolapse common in older women – if symptomatic then treat
- If visible at the introitus – then refer for a specialist opinion
Bladder diaries

- Many
- Difficult to obtain
- 3-day optimal
- Simple recall is poor
Make a diagnosis!

UI

- Stress
- Urgency
- Mixed
  - Ineffective voiding
- Functional
MANAGEMENT OF URINARY INCONTINENCE IN FRAIL OLDER PERSONS

**HX/ SX ASSESSMENT**

**CLINICAL ASSESSMENT**

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

**CLINICAL DIAGNOSIS**

- Urgency UI *
- Significant PVR*
- Stress UI*
- Other*

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

**INITIAL MANAGEMENT**

(If Mixed UI, initially treat most bothersome symptoms)

**ONGOING MANAGEMENT and REASSESSMENT**

- Lifestyle interventions
- Behavioral therapies
- Consider addition and trial of antimuscarinic drugs
- Treat constipation
- Review medications
- Consider trial of alpha-blocker (men)
- Catheter drainage if PVR 200-500 ml, then reassess (see text)
- If insufficient improvement, reassess for and treat contributing comorbidity +/- functional impairment
- If continued insufficient improvement, or severe associated symptoms are present, consider specialist referral as appropriate per patient preferences and comorbidity (see text)
Which conservative interventions work in older people?

- Limited evidence available that bladder training may be helpful for the treatment of urinary incontinence.
- PFMT for women with stress, urge, or mixed, urinary incontinence - treatment effect might be greater in younger women.
- Limited worthwhile evidence for habit-retraining programmes.
Promoted voiding

• involves prompts to toilet with social approval and was first used in the 1980s

• It was designed to increase requests for toileting and self-initiated toileting, and decrease the number of wet episodes

• Level 1 evidence exists that prompted voiding is effective in the short-term for improving daytime dryness in nursing home residents and in some home care clients.

• Findings vary in terms of the characteristics of patients who respond to behavioural interventions

• The best predictors of responsiveness to prompted voiding in nursing home residents were
  – the ability to ambulate independently
  – appropriate toileting rates > 66%
  – wet rate of <20%

• residents with a high baseline UI rate responded to habit training with prompting, suggesting that improvement was due to patient initiated requests to void.

• Cognitively intact residents with normal bladder capacity also were more likely to respond.
Habit retraining

- involves the identification of the incontinent person’s individual toileting pattern, including incontinence episodes, usually by means of a bladder diary.
- A toileting schedule is then devised to pre-empt an incontinence episode.
- dependent on active caregiver participation.
- There is no attempt in habit retraining to alter an individual’s voiding pattern as is the case with bladder retraining.

Timed voiding

- involves toileting an individual at fixed intervals, such as every 2 hours.
- This is considered a passive toileting programme; no attempts are made to re-establish voiding patterns and patient education or reinforcement of certain behaviours is not required.

Management

- Prompted voiding should be offered to decrease daytime UI in nursing home residents and homebound older adults. (Grade A)

- Efforts must be made to increase and maintain caregiver compliance with prompted voiding. (Grade B)

- No recommendation for habit retraining with frail older people is possible. (Grade D)

- No recommendation for timed voiding with frail elderly people is possible. (Grade D)
Treatment of urgency incontinence in older people

A combination of behavioural techniques +/- antimuscarinic drugs is effective for housebound adults


Drugs

- Darifenacin
- Fesoterodine
- Oxybutynin IR / ER / transdermal patch / gel
- Propiverine
- Solifenacin
- Tolterodine IR / ER
- Trospium IR / ER

- In development
  - Mirabegron, beta three agonist
Beware...

- The use of drugs with antimuscarinic properties is associated with low cognitive performance among community-dwelling elderly people.

Serum anticholinergic levels
Ranked according to frequency of prescriptions in older adults


*Medications with the five highest levels of anticholinergic activity.
Drugs

• Nocturia / nocturnal polyuria
  – Late afternoon diuretics
  – NSAID
  – DDAVP (NB: elderly)
  – (imipramine)
Drugs

- **BOO**
  - Alpha adrenoreceptor blockers
  - Finasteride / dutasteride
  - Combination
- **SUI**
  - duloxetine
Botulinum toxin

- 10 – 30 injections into dome of bladder
- 1 - 200 i.u. (idiopathic)
- 200 i.u. (neurogenic)

- Resolution of symptoms - up to 14 months
- Retention 10-40% (definition)
Older men

- Gathering evidence for efficacy of medical treatments

LUTS ≠ prostate!!


BJU Int. 2006 May;97(5):1003-6.
Old

- Big surgery
- Long hospital stay
- Complications
New

90+% cure
Overnight stay
At least 10 years follow-up
Complications, depending upon technique
The effect of age on outcomes of sling surgery for urinary incontinence.

- overall outcomes in younger women (aged 65-74) significantly better than in older women
  - postoperative urge incontinence (20.0% vs 12.6%)
  - treatment failure (10.5% vs 7.2%)
  - outlet obstruction (10.5% vs 6.6%)

- Older age and greater comorbidity were associated with greater risk of adverse events

• Improved quality of life\textsuperscript{1}
• TVT surgery showed a significant improvement in QOL, patient satisfaction and less urinary problems\textsuperscript{2}

Pads, appliances catheters

- All have a role
- Can form a pragmatic solution
- Individualised assessment warranted
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