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MEDICINE & DENTISTRY
UNIVERSITY OF ALBERTA

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

Neurourol Urodyn 2002; 21: 167-187

Lower urinary tract symptoms (LUTS)

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Storage	Voiding	Post micturition
Frequency Nocturia Enuresis Urgency Urgency incontinence Stress UI Mixed incontinence Continuous UI	Slow stream Splitting or spraying Intermittency Hesitancy Straining Terminal dribble	Incomplete emptying Post micturition dribble

Prevalence of storage symptoms in women in association with age

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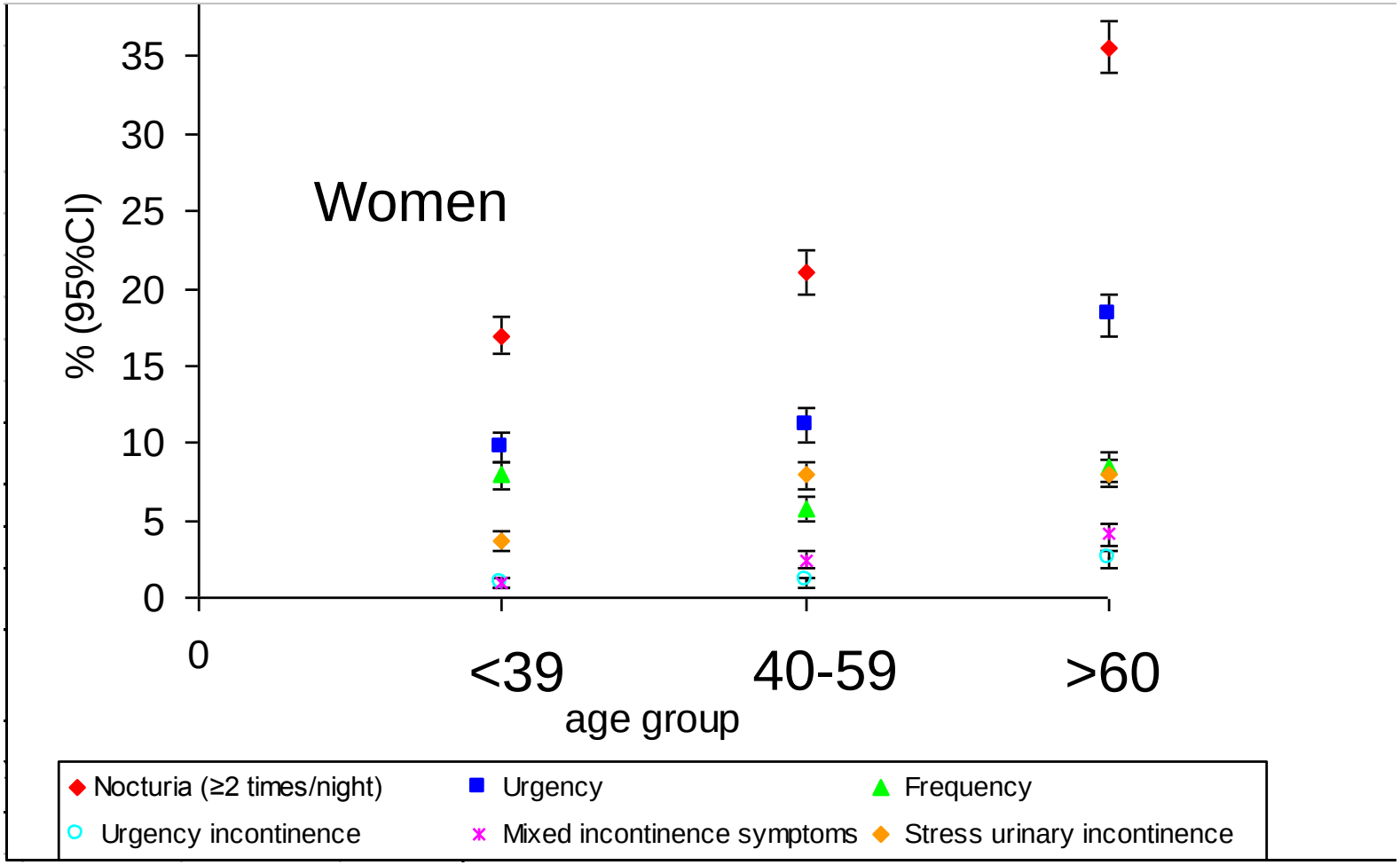

Adapted from Irwin DE, Milsom I, Hunskaar S, et al. Eur Urol 2006;50:1306-15 (the EPIC study)

Prevalence of storage symptoms in men in association with age

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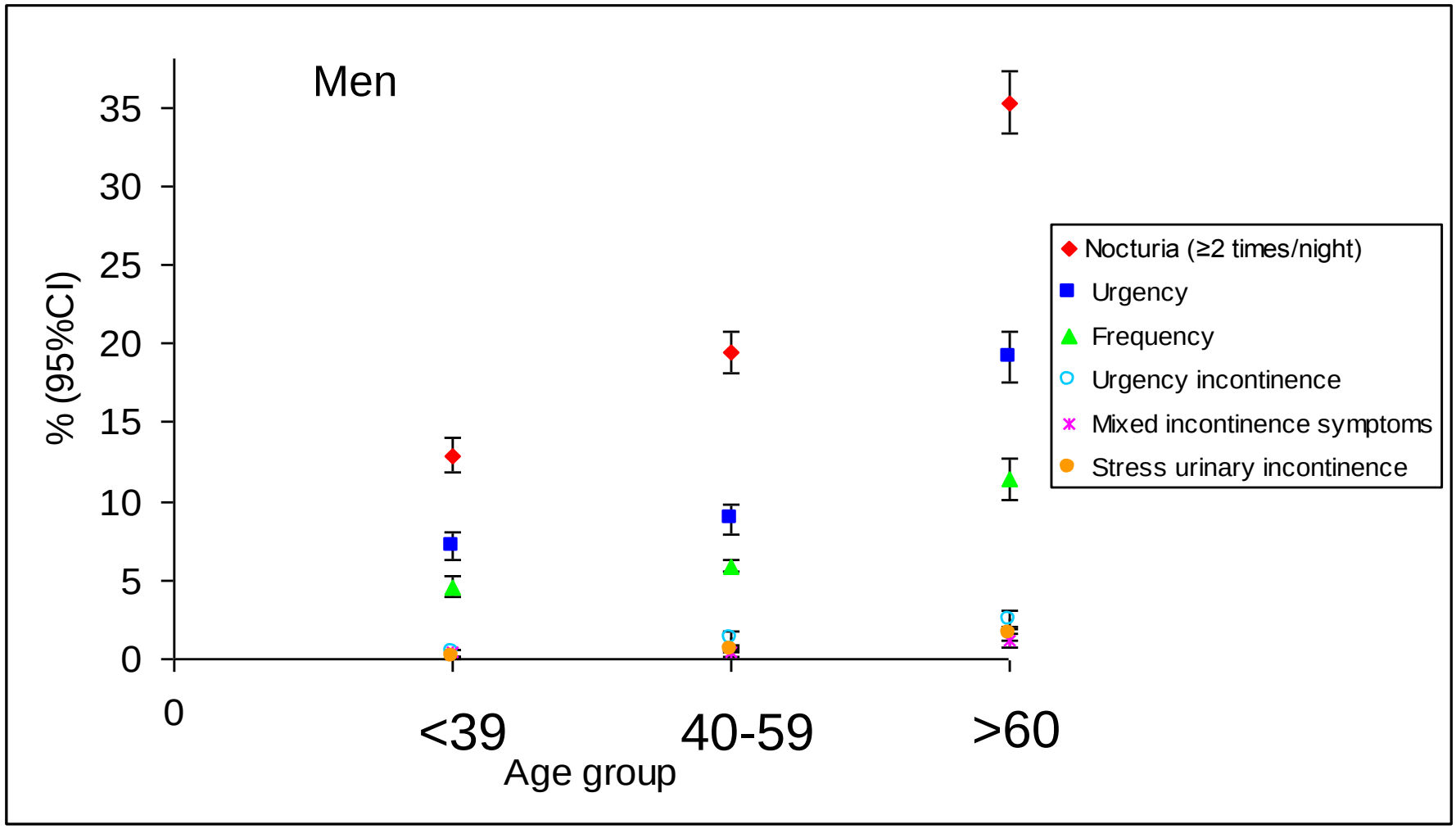

Adapted from Irwin DE, Milsom I, Hunskaar S, et al. Eur Urol 2006;50:1306-15 (the EPIC study)

Prevalence of voiding symptoms by age and sex

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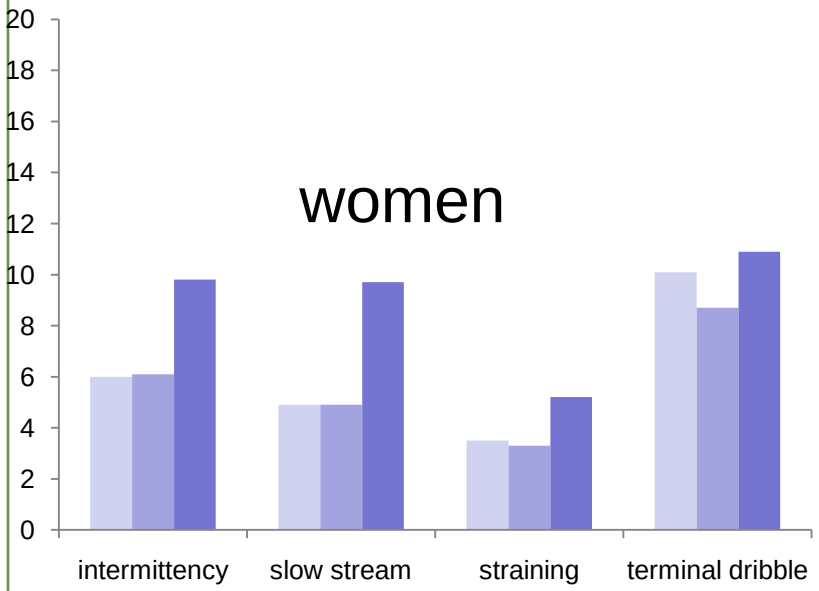

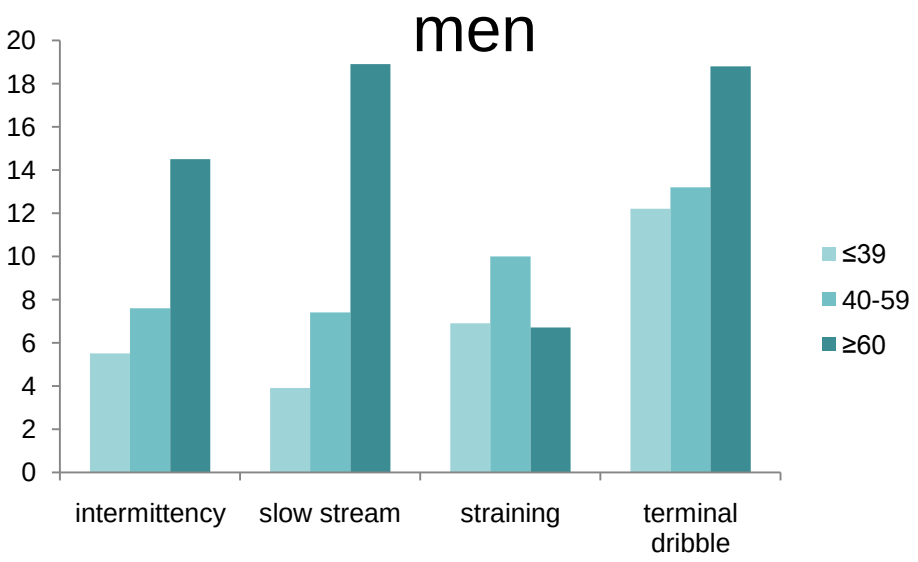

Older people generally experience more severe incontinence than the young

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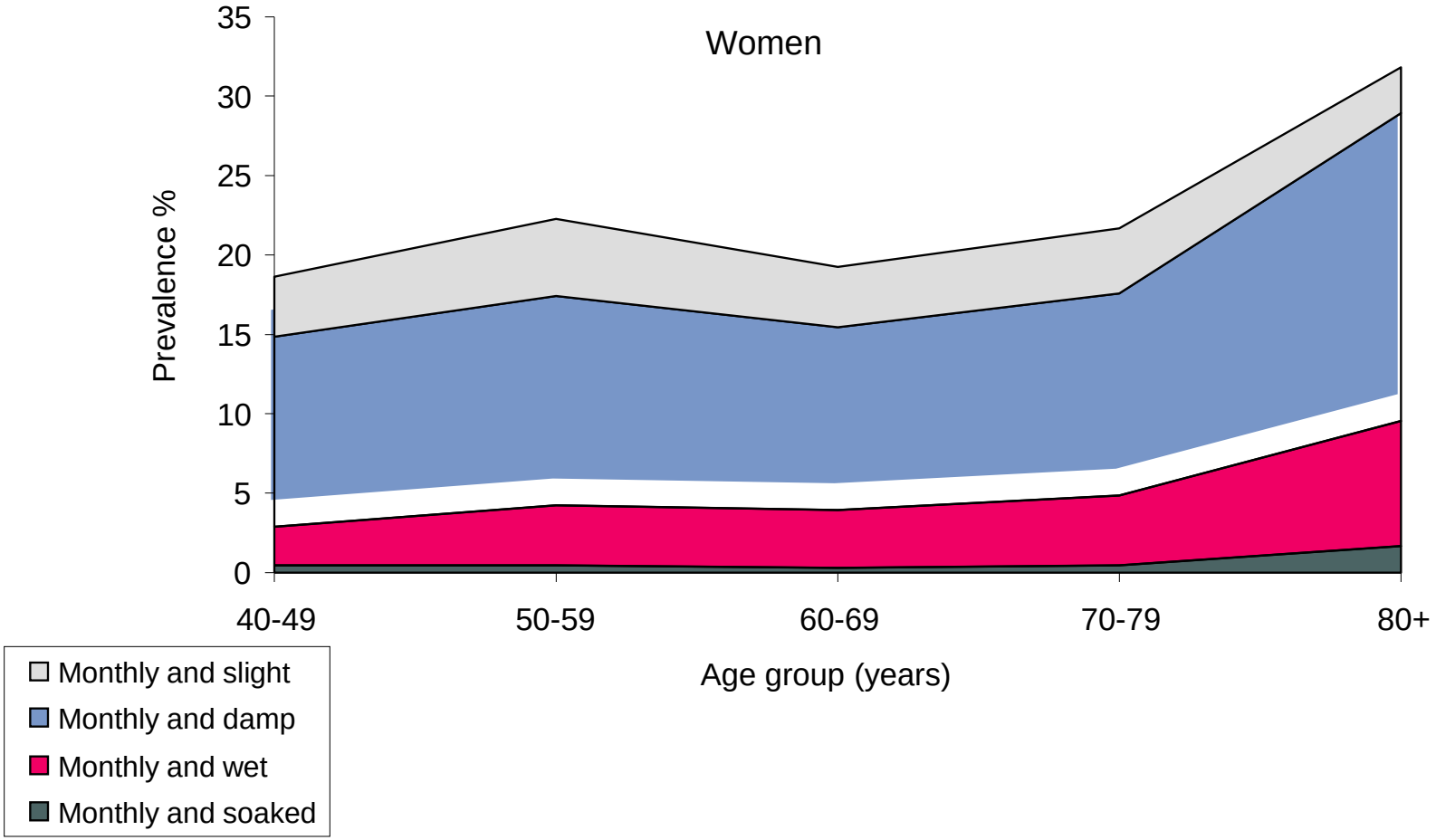
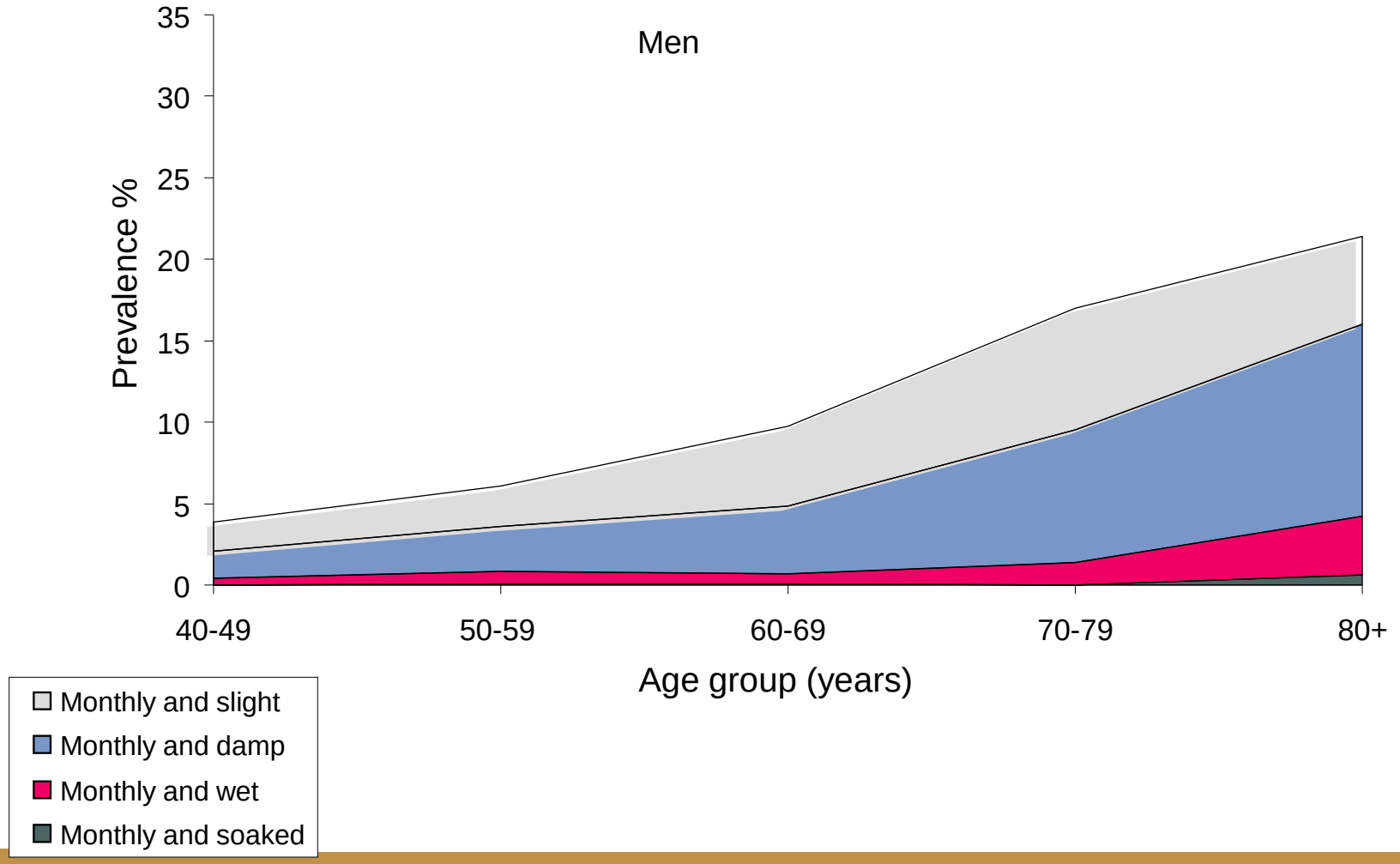


Perry S et al. J Public Health Med 2000; 22(3):427-34 (the Leicestershire MRC incontinence study)



Perry S et al. J Public Health Med 2000; 22(3):427-34 (the Leicestershire MRC incontinence study)

Prevalence in Care Homes

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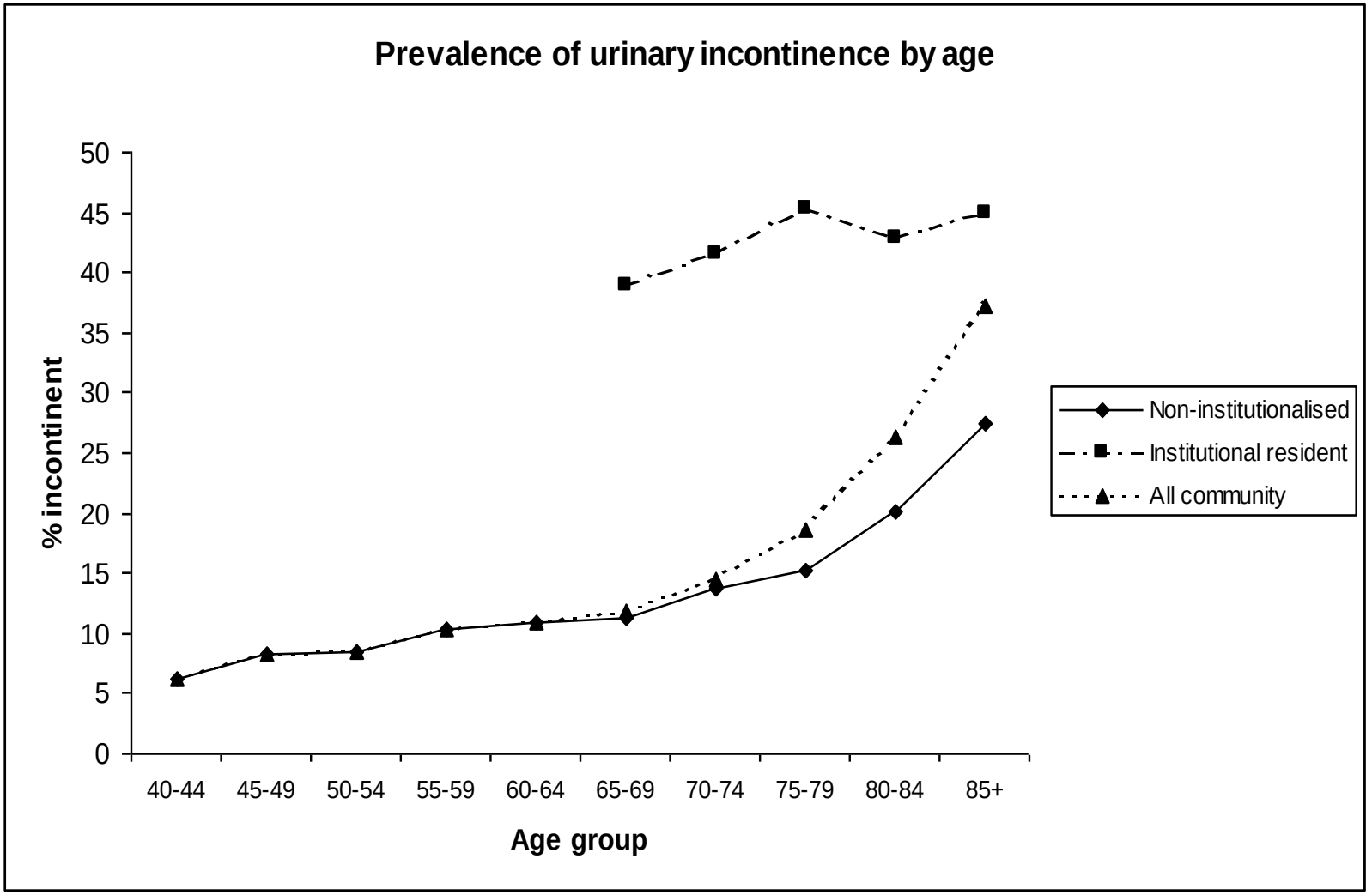


Impact

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

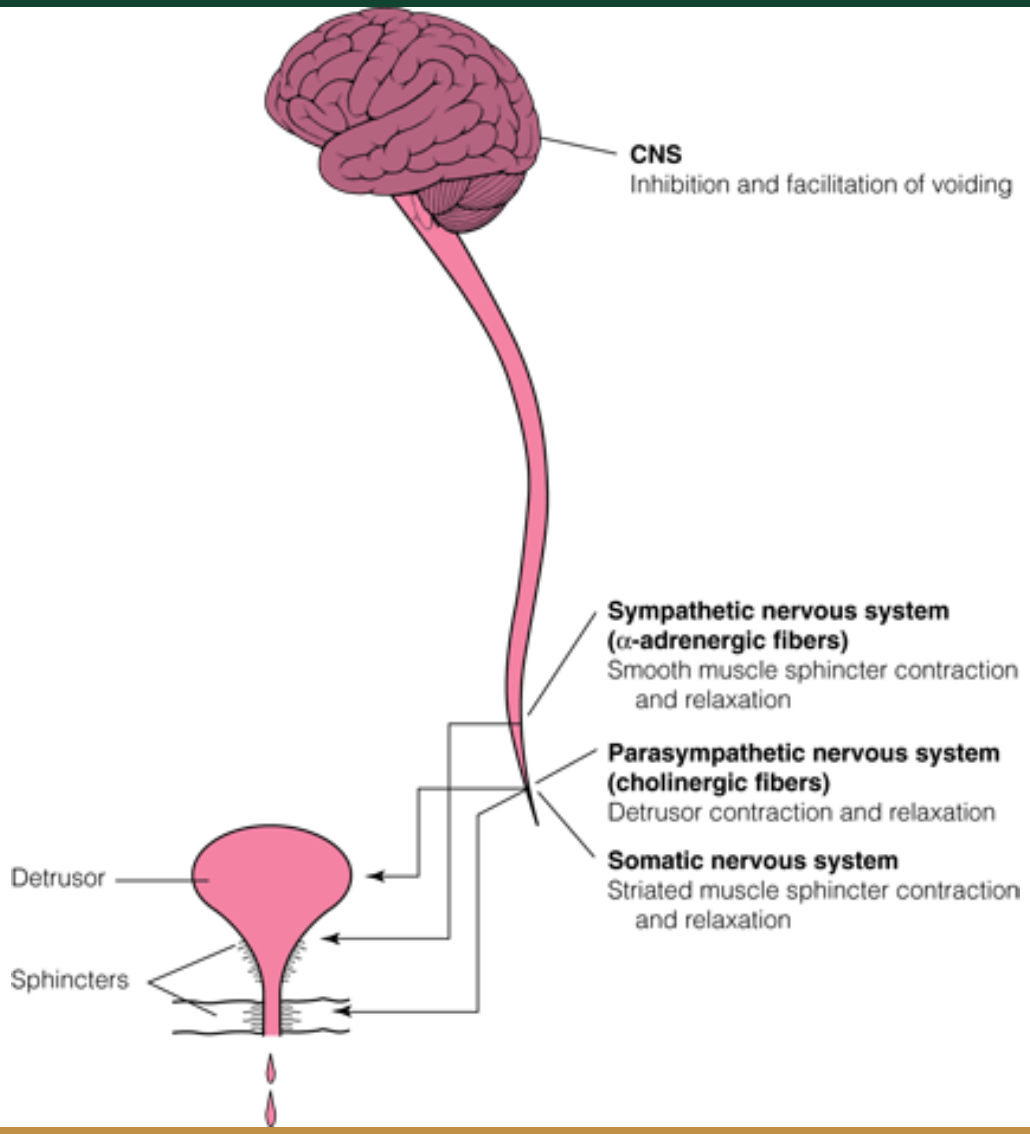
Cost

- Nursing home admissions
- Healthcare costs
  - £473m (2001 UK),
  - $20b US (direct costs - 2004)
  - €350 – 650/ yr per woman in Europe (2006)

- Social / personal

- Caregiver

Physiological control of micturition



Alterations in lower urinary tract function associated with increased age

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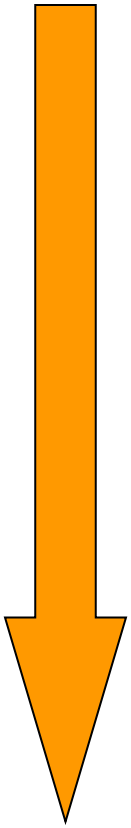
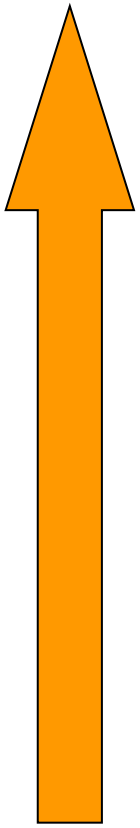


- Bladder capacity
- Sensation of filling
- Speed of contraction of detrusor
- Pelvic floor muscle bulk & tone
- Sphincteric “resistance”
- Urinary flow rate



- Urinary frequency
- Prevalence of post void residual volumes
- Outflow tract obstruction (♂)

Bladder capacity

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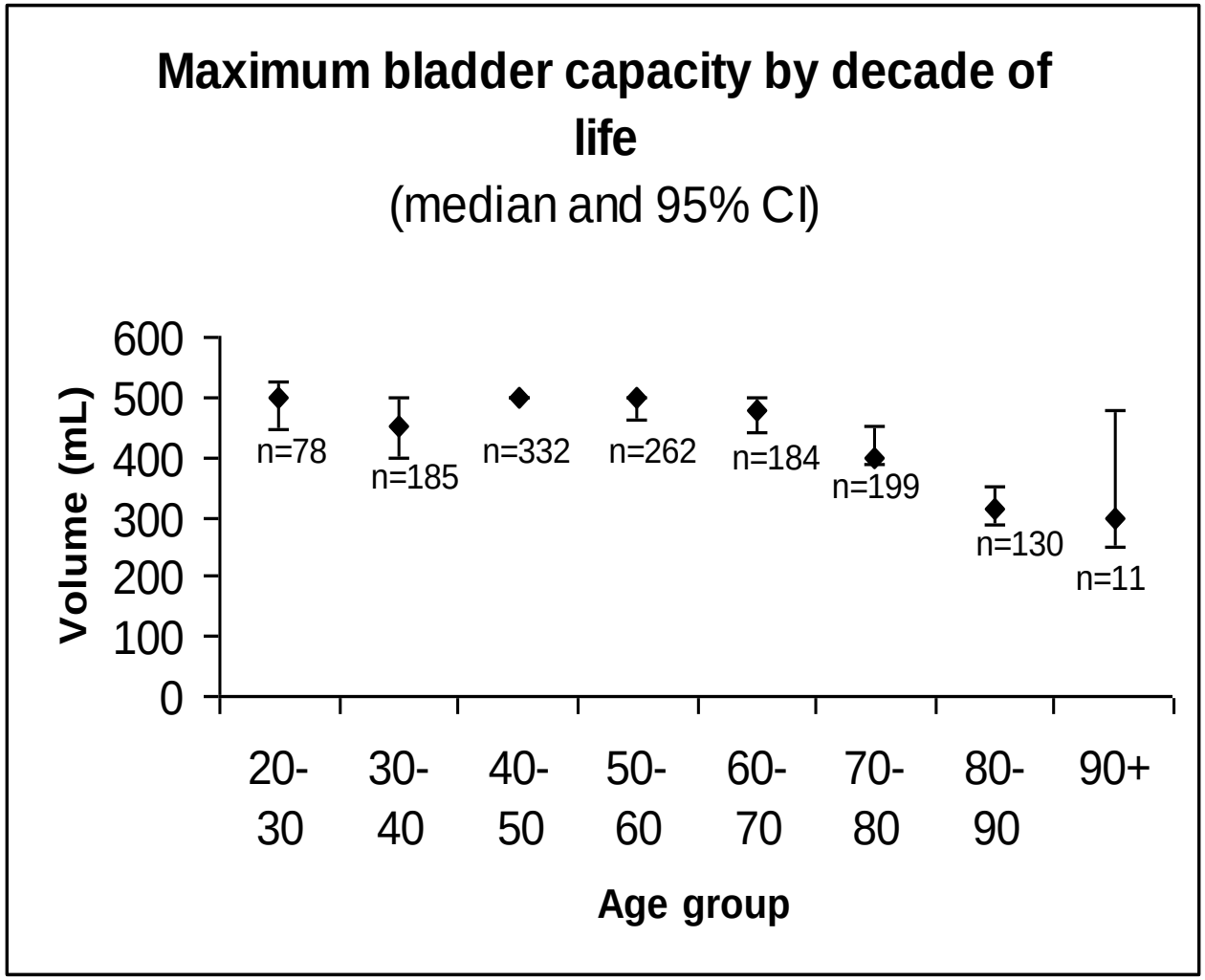

Collas DM, *Int Urogynecol J* 1996; 7: 24-29.

Contractile function in association with greater age

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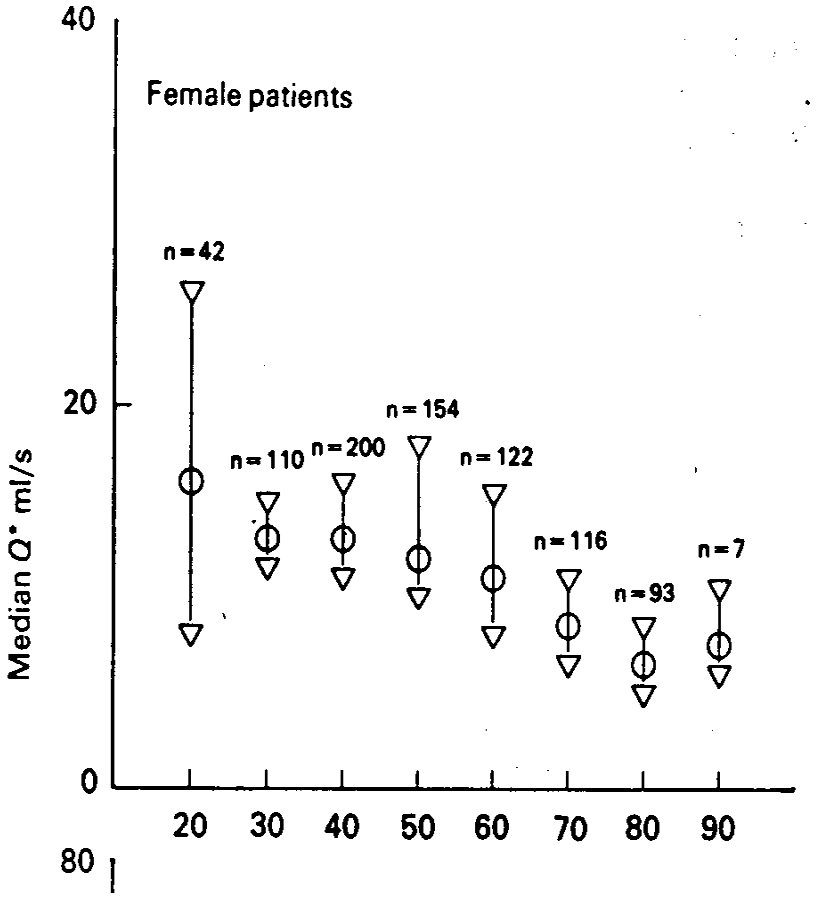

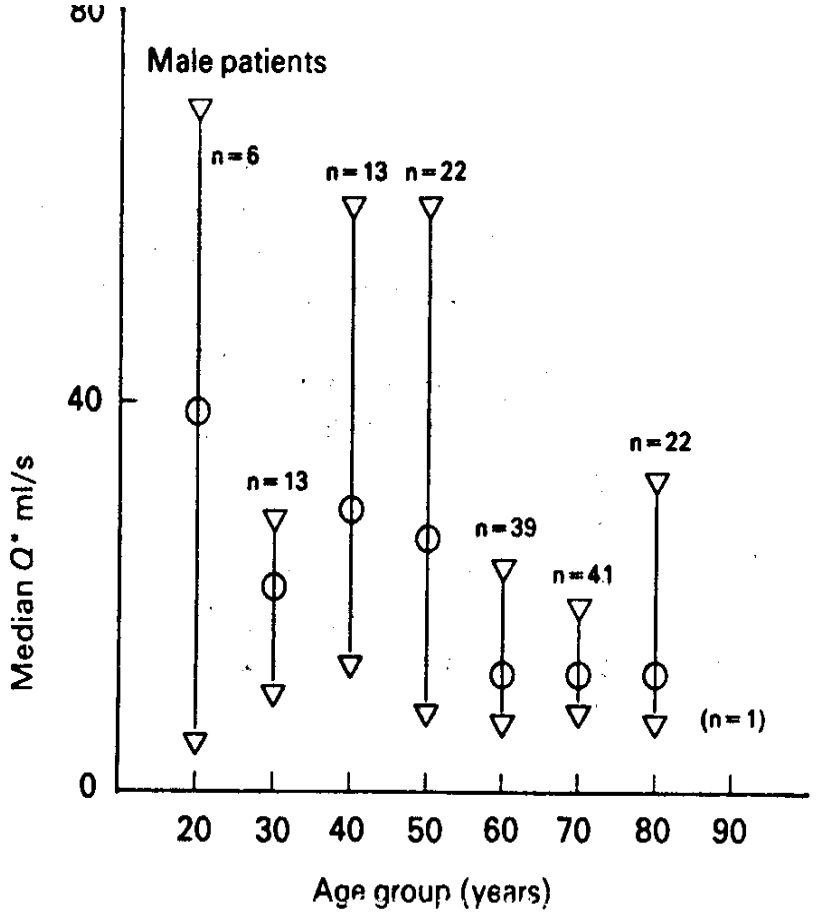

Age-related fall in women $p<0.001$, men $p=0.17$

n (women) = 844, men = 157

Sensation

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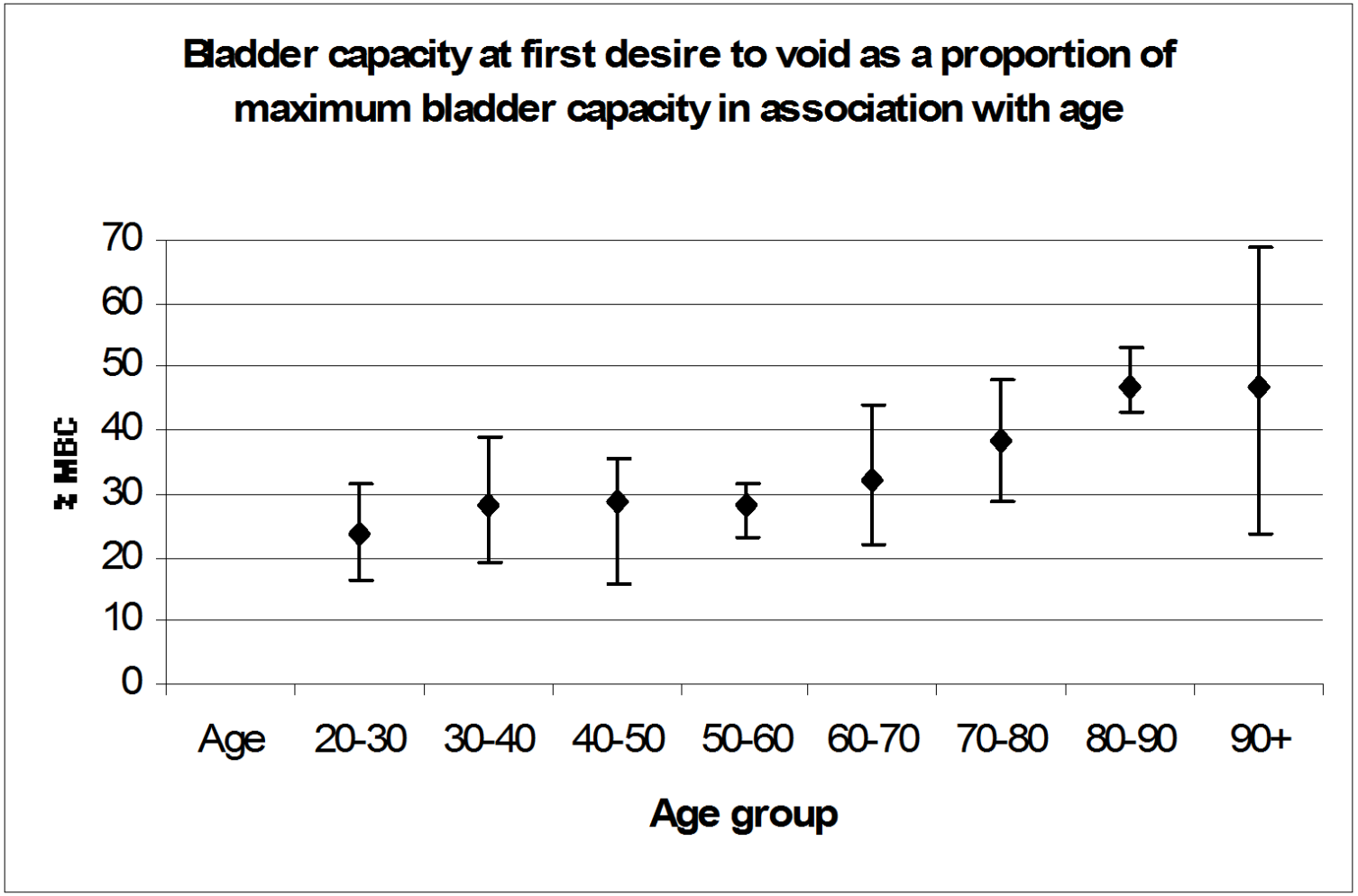

Median maximum flow rate for men and women in relation to age

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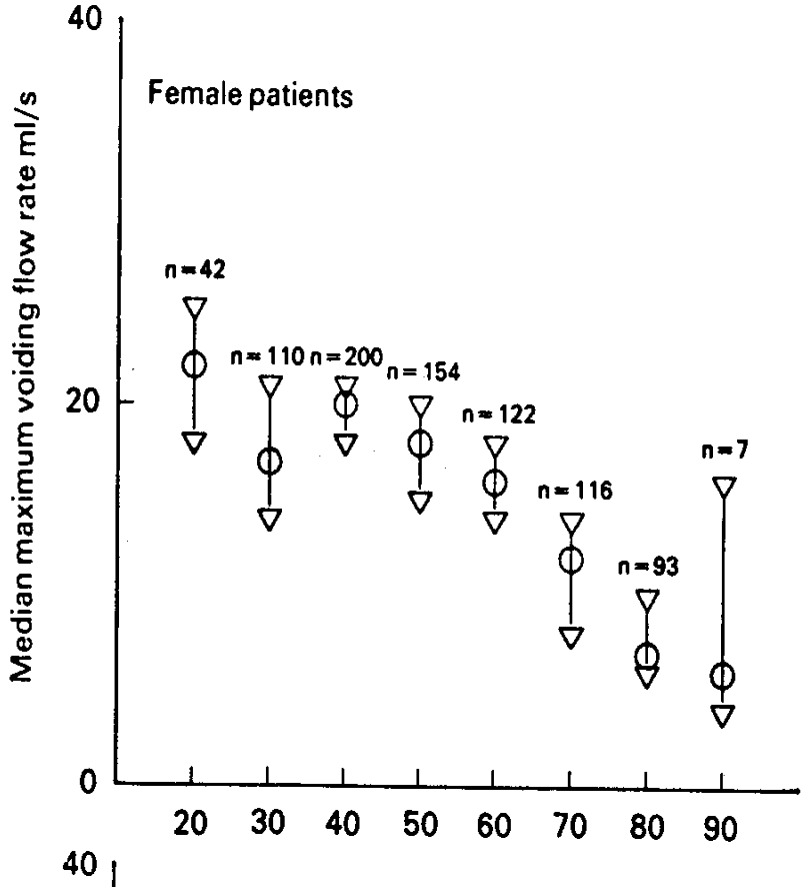

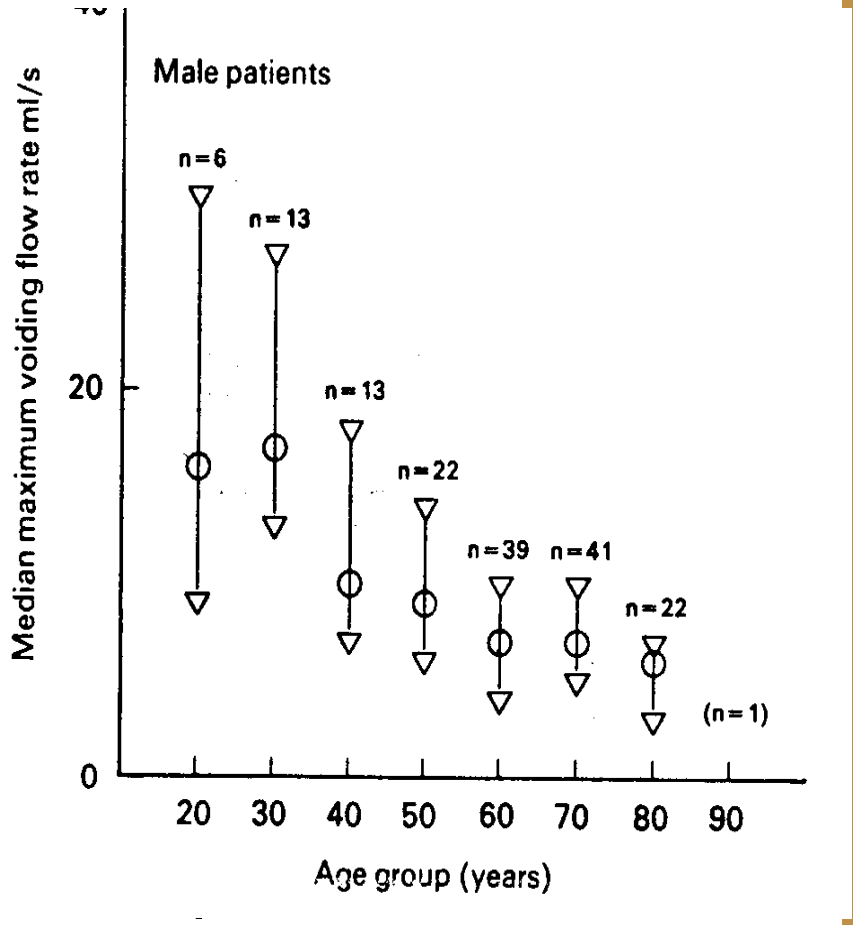

Women and men, $p<0.001$

Residual volumes

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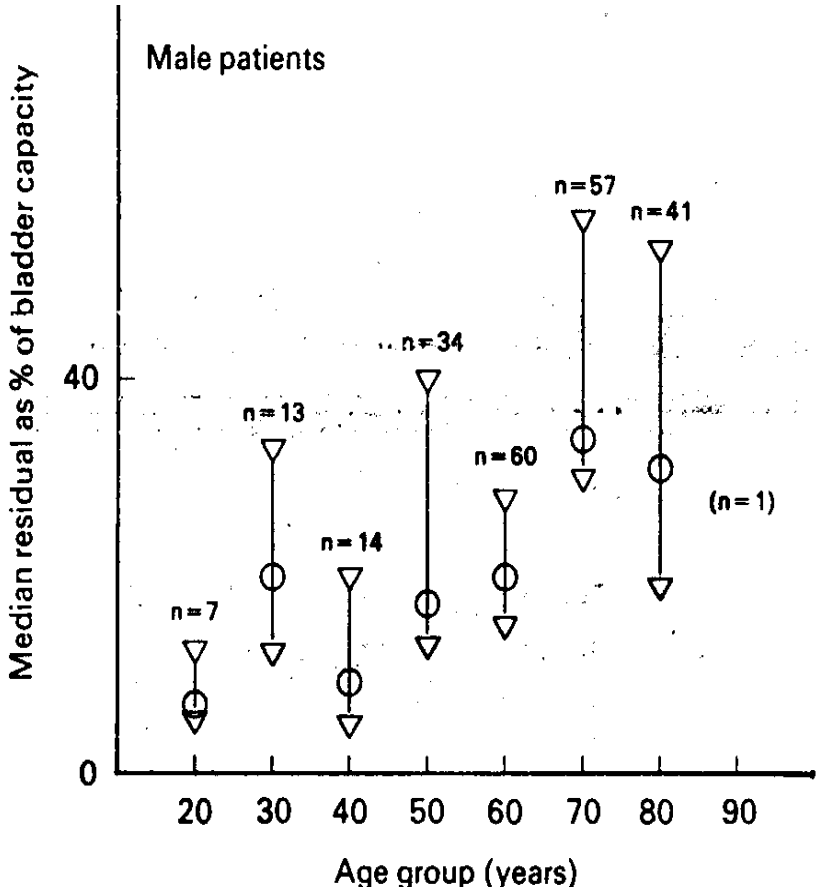

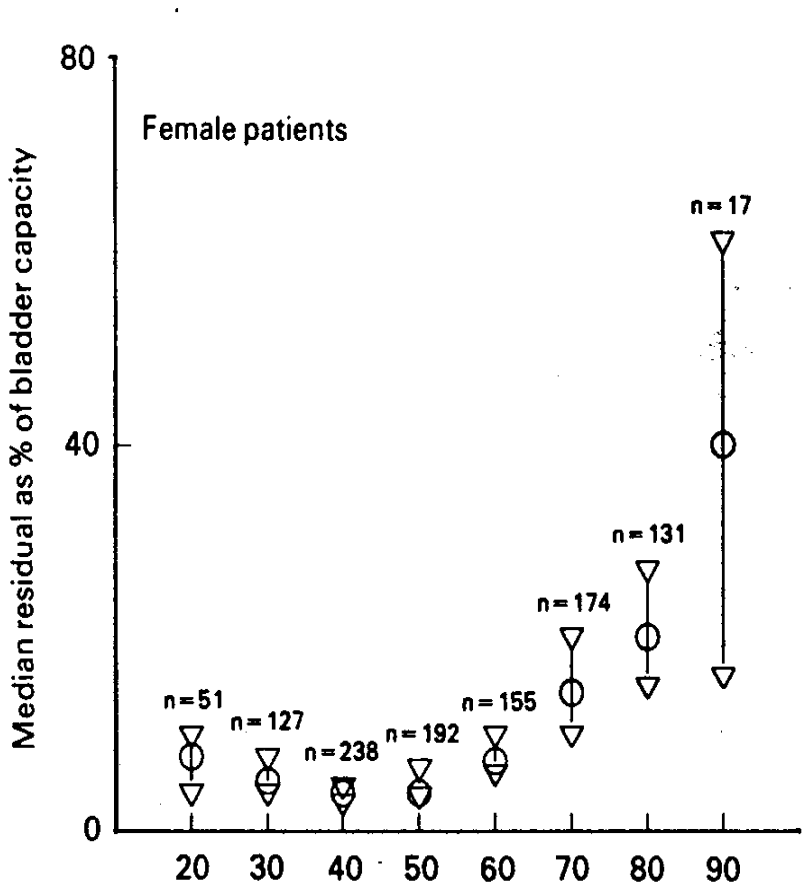

Malone-Lee JG. *Br J Urol* 1993; 72: 873-880.

Urge in older men

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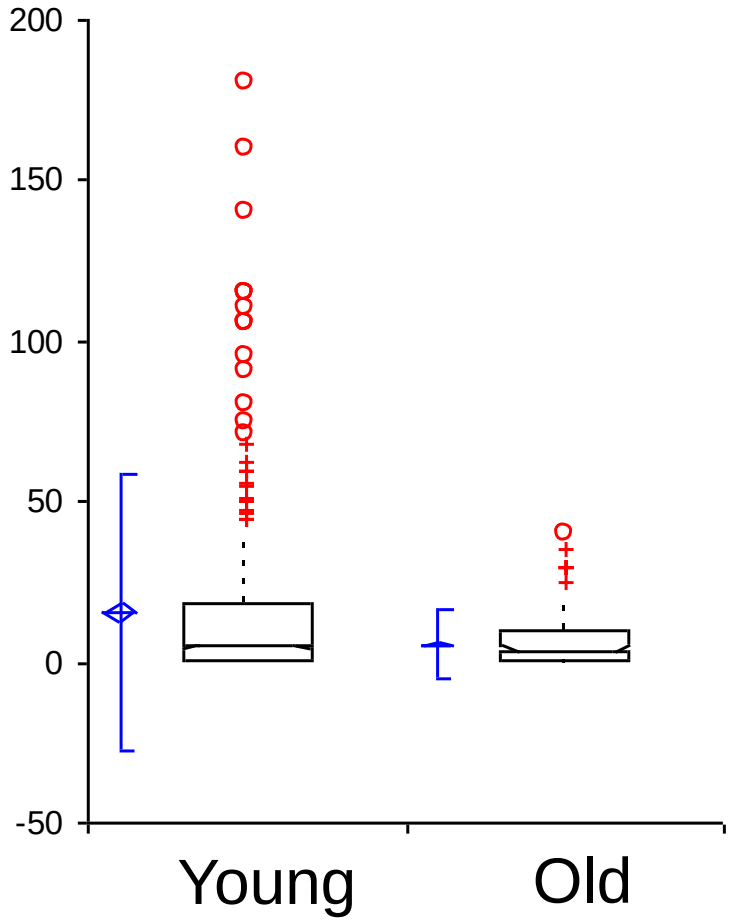

The interval was (median and 95%CI) 5 (4 – 5) and 3 (3 – 5) minutes in older men. The intervals were statistically significantly different (W=31294.5, p<0.0001)

Urethral Function

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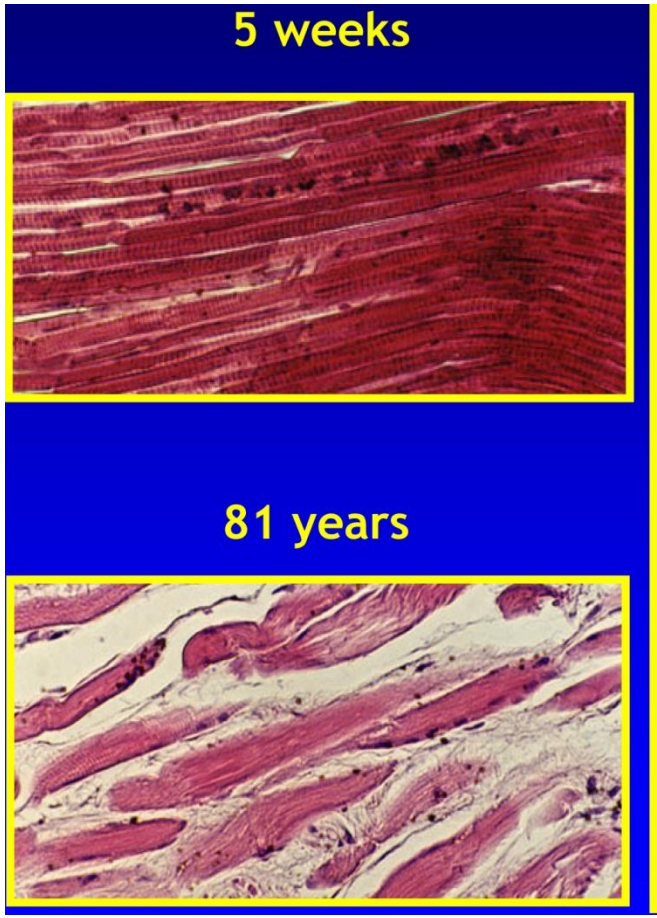
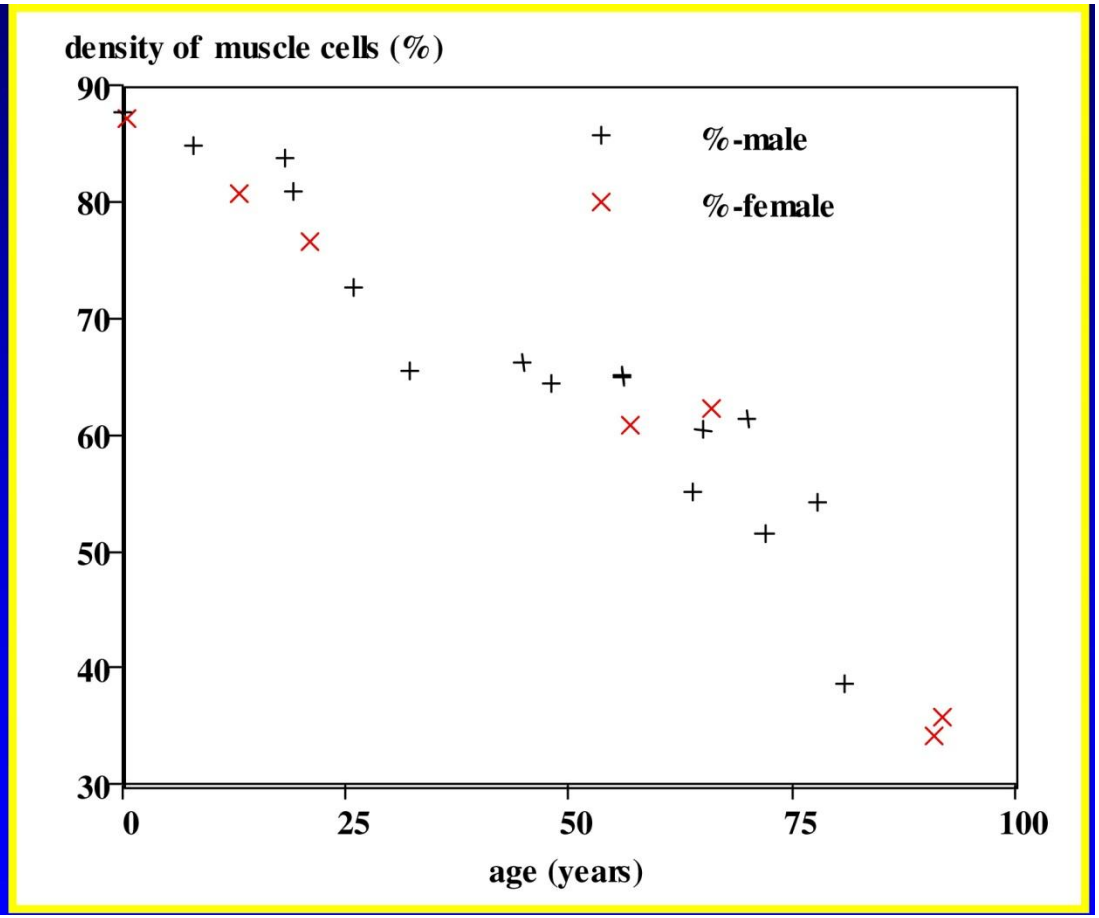
Loss of striated muscle cells in association with greater age





Strasser H, Tiefenthaler M, Steinlechner M, Bartsch G, Konwalinka G. Urinary incontinence in the elderly and age-dependent apoptosis of rhabdosphincter cells. *Lancet* 1999;354:918-9

Maximum urethral closure pressure is lower in association with greater age

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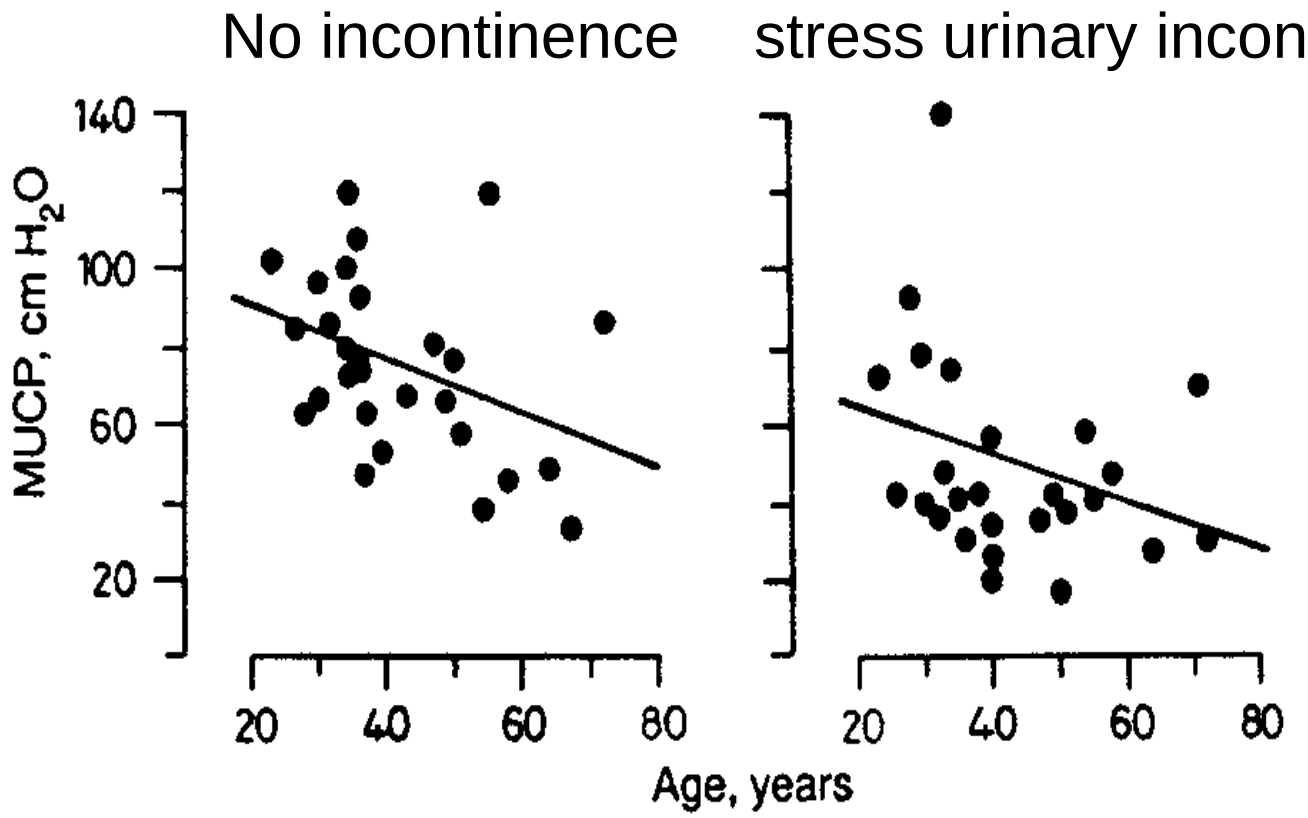
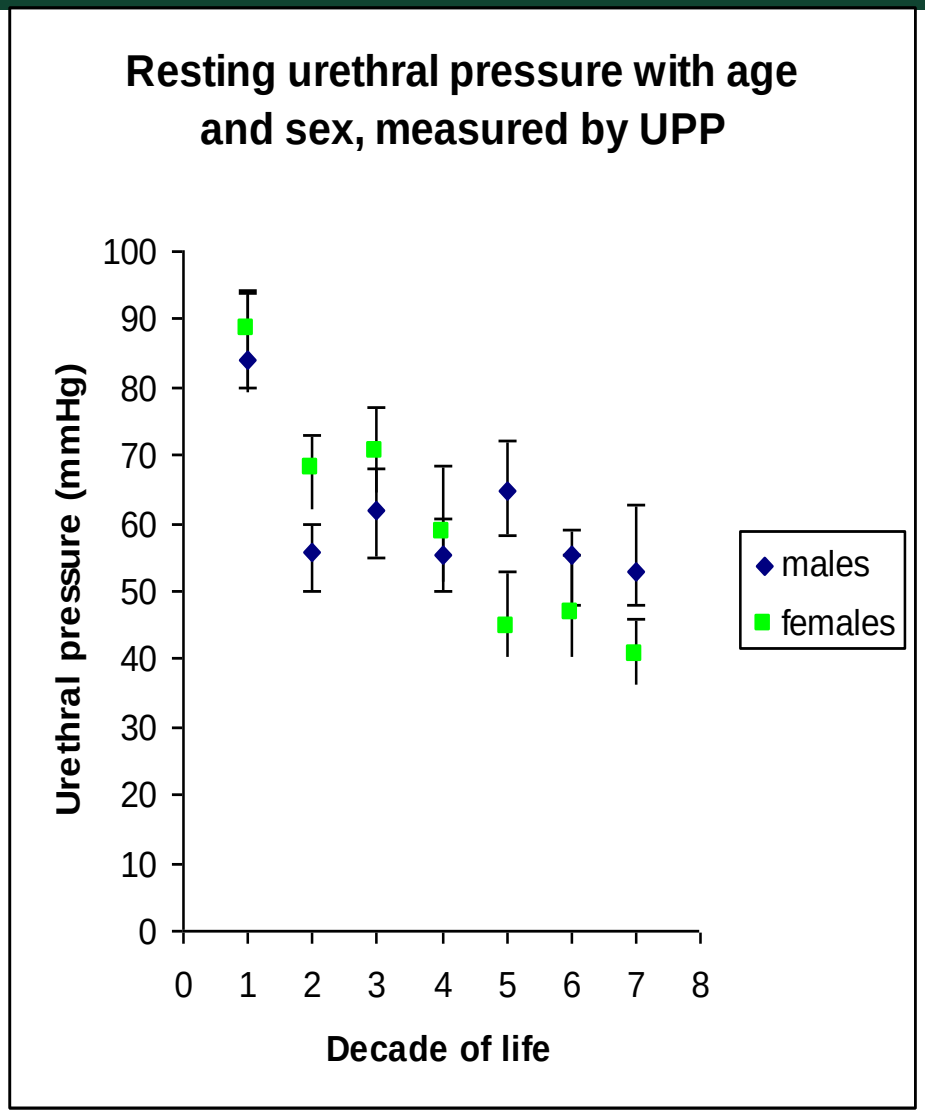


r= -0.4, p=0.03



From Haubensak 1975

Prevalence of incontinence type by age

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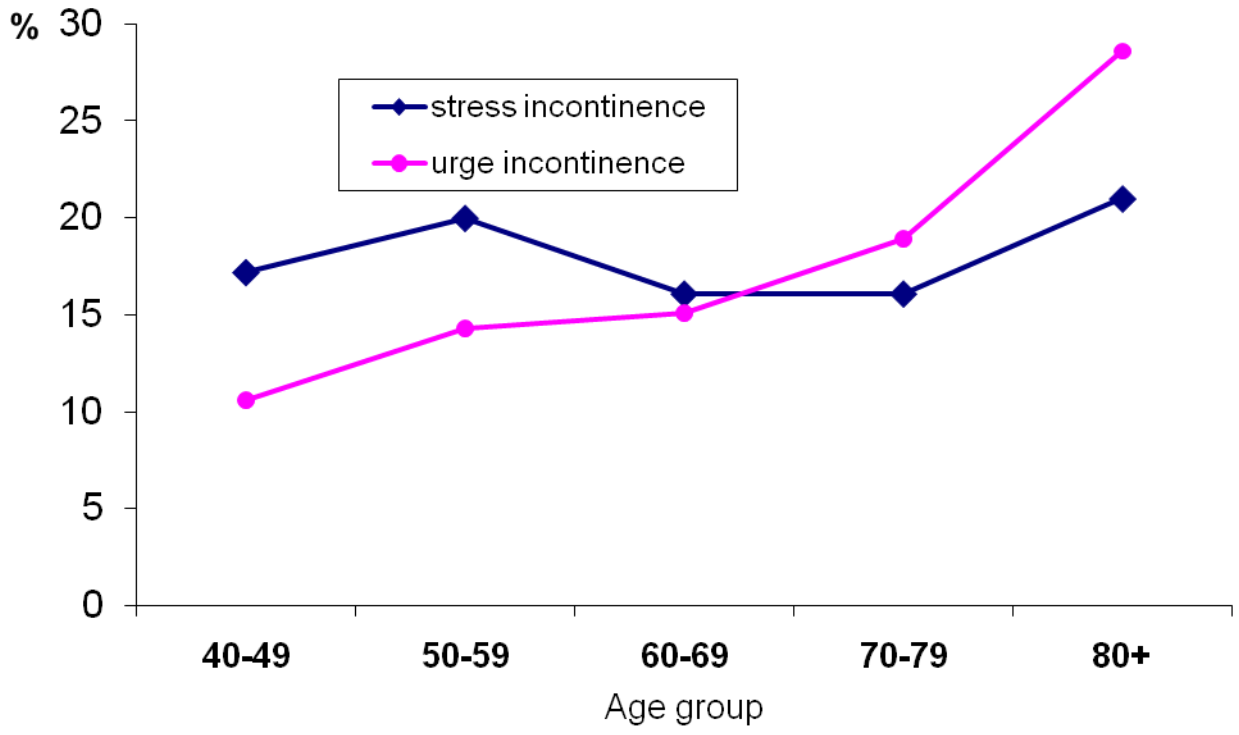

Overactive bladder syndrome

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- **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

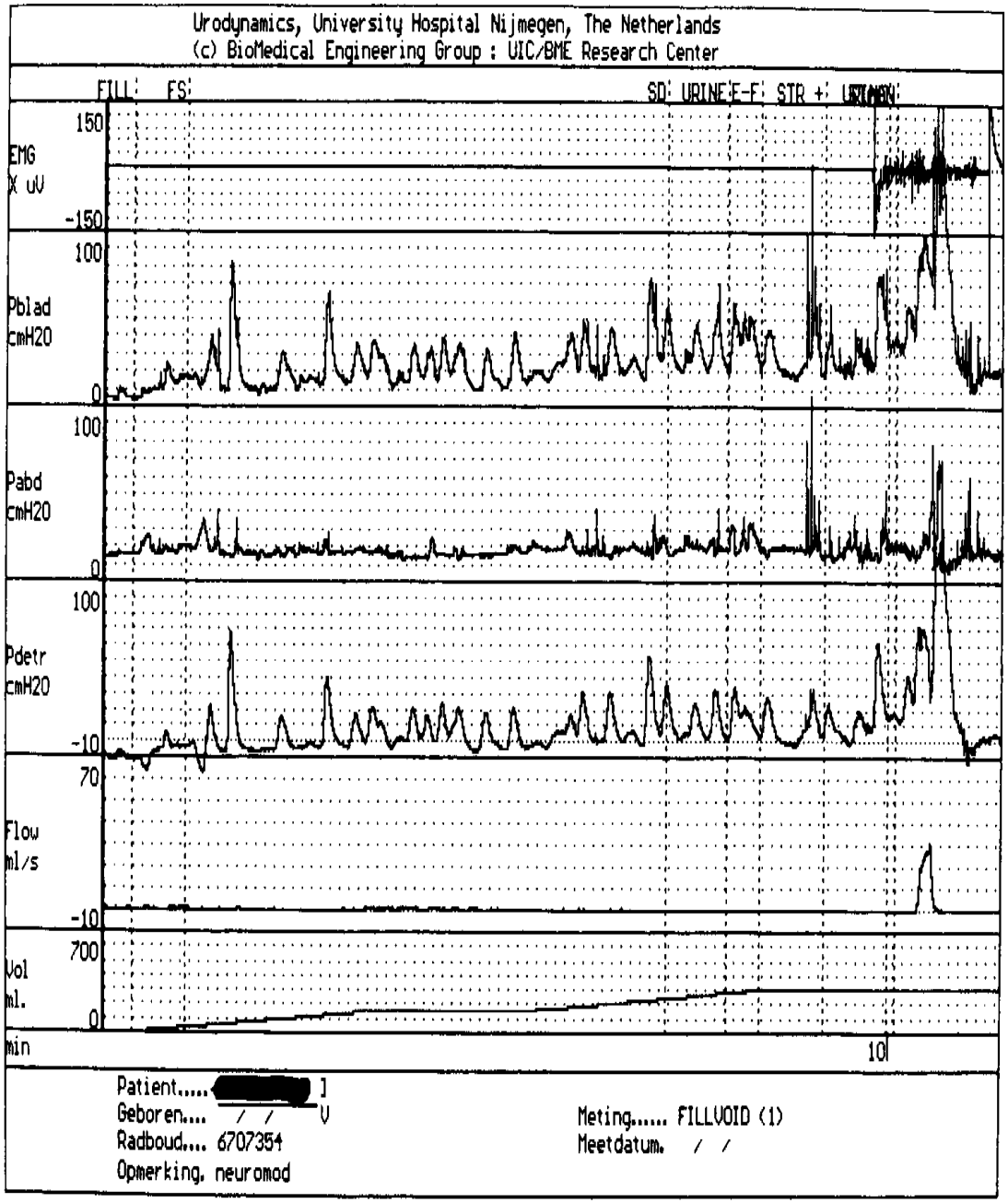
- Diagnosed by observation of involuntary detrusor contractions during filling phase of cystometrogram which may be spontaneous or provoked ICS 2002

Intravesical pressure

Rectal pressure

Detrusor pressure

Volume infused



Stress urinary incontinence

- **Symptom:**

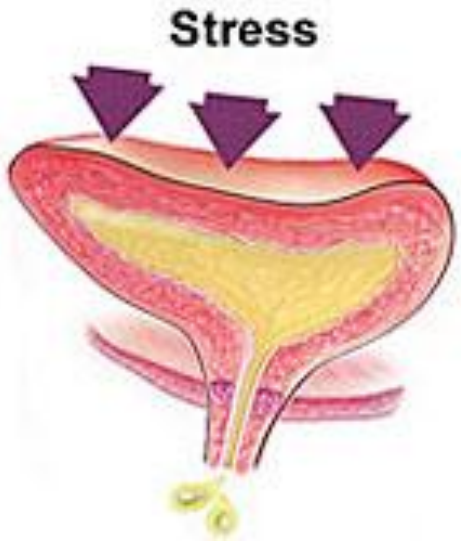
"The complaint of involuntary leakage on effort or exertion, or on sneezing and coughing."

- **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

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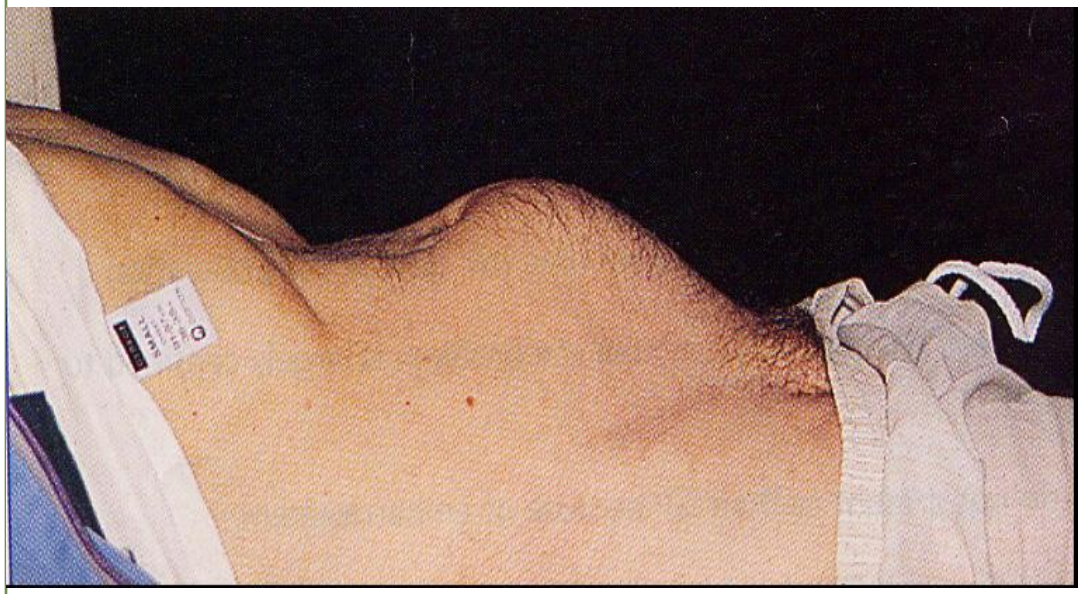
- The complaint of involuntary leakage associated with urgency and also with exertion, effort, sneezing or coughing
- There is difficulty with the definition –is it merely a combination of urgency & SI, or SI +urgency incontinence
- Women with pure SUI may complain of “urgency”

Functional incontinence

- NO lower urinary tract disease
- Cognitive, behavioural or physical impairment leads to UI

Overflow incontinence – continuous leakage



Of women presenting for care:

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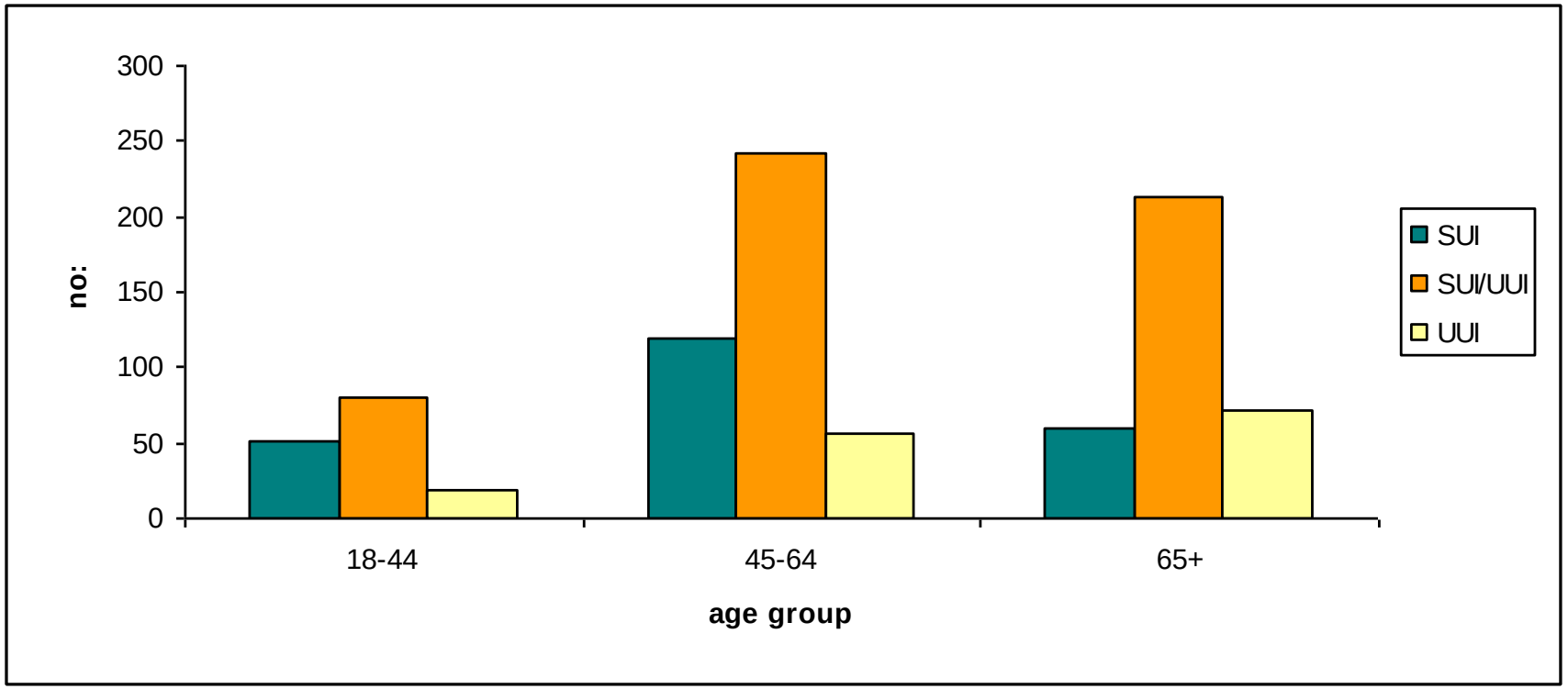

1070 women either receiving or presenting for UI care in UK/RoI 2004 (Wagg 2005)

Assessing the patient

- History
- Examination
- Initial management

Assessing the patient

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Storage symptoms	Voiding symptoms	Post micturition symptoms
• Nocturia	• Slow stream	• Incomplete bladder emptying
• Increased daytime frequency	• Splitting	• Post micturition dribble
• Urgency	• Hesitancy	
• Urgency incontinence	• Intermittency	
	• Terminal dribble	
	• Straining	

Abrams P et al. Urology 2003;61:37-49

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

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- 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

Assesment

- History
  - Storage symptoms
  - Voiding symptoms
  - Co-morbidity
  - Gynaecological / obstetric / urological history
  - Bother
  - Expectations and aims of treatment
- Assessment
  - Toileting ability
  - Cognition
  - Reversible causes

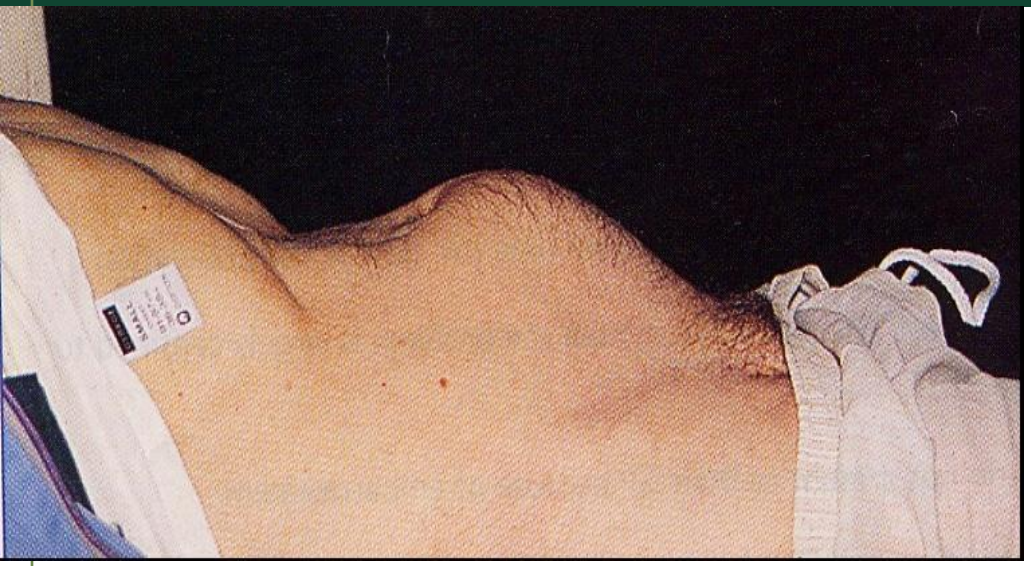
Red flags

- **Pain**
  - Exclude acute cystitis
- **Haematuria**
  - Macroscopic (refer)
  - Dipstick microscopic (validate before referral)

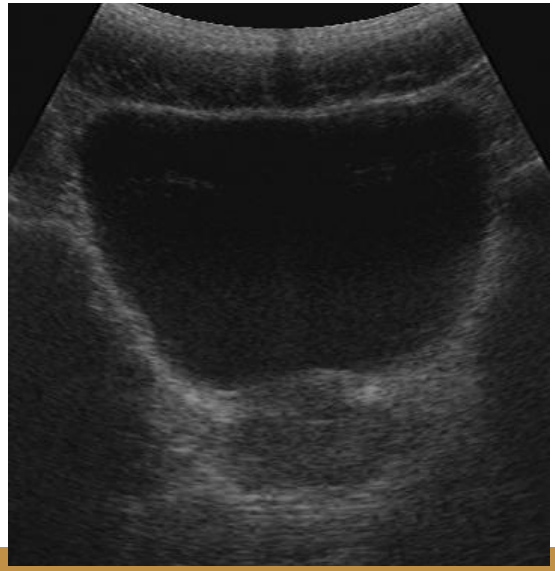
Reversible causes of UI

- **D** delirium
- **I** infection
- **P** pharmaceuticals
- **P** psychological
- **E** excess urine output
- **R** reduced mobility
- **S** stool impaction

Examination



For women c/o voiding Sx
For all men
Rule out significant voiding inefficiency leading to retention of urine.

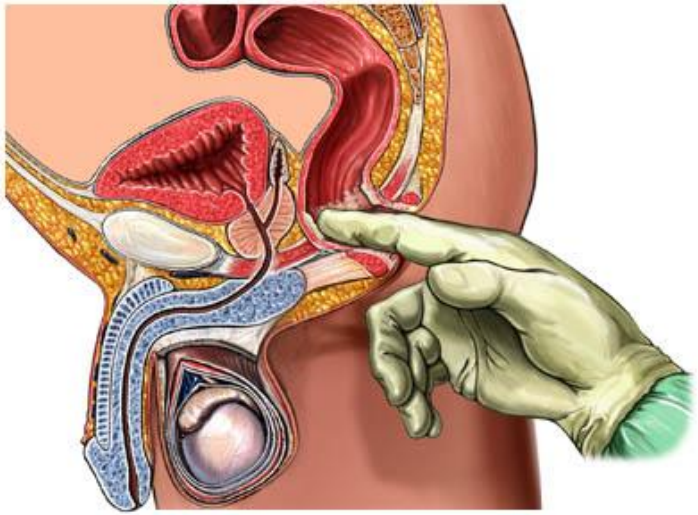


Infection:

- 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

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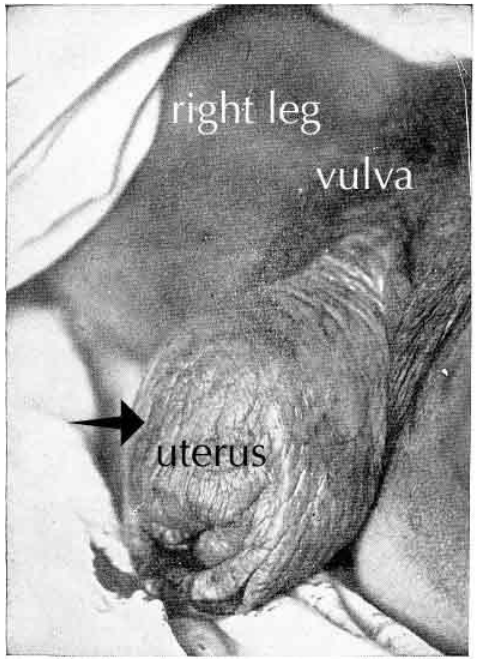
- Associated prolapse common in older women – if symptomatic then treat
- If visible at the introitus – then refer for a specialist opinion



Bladder diaries

- Many
- Difficult to obtain
- 3-day optimal

- Simple recall is poor

Subject ID: Visit number: Date

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Bladder diary

Please fill in this diary to the best of your ability. Your clinician will let you know if you need to measure the amount of urine you pass each time you visit the toilet but, in any case please mark when you go to the toilet using the scale on the left of the grid. Please could you also use the grading below to indicate your symptoms at that time?

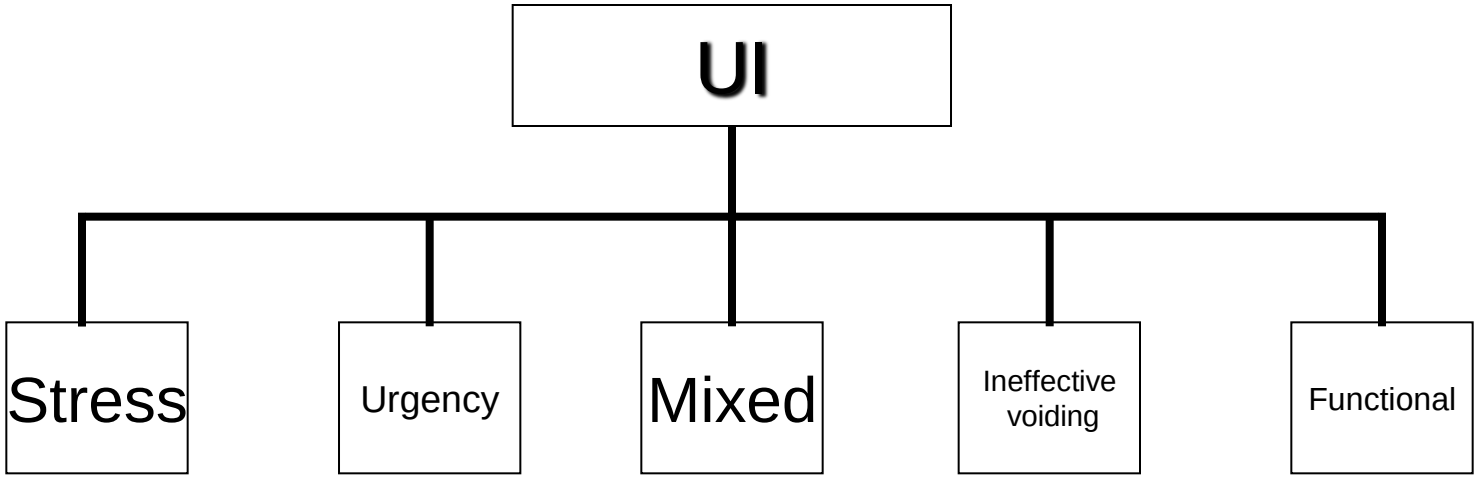
Please rate the bladder sensation that you felt with each time you passed urine using the following scale.

1 – **No feeling of urgency**: I could continue activities until I chose to use the toilet
2 – **Mild feeling of urgency**: I could feel the need to urinate but it was easily tolerated, I could finish my activity or task before going to the toilet.
3 – **Moderate feeling of urgency**: My urgency caused discomfort. I needed to stop my activity or task and go to the toilet.
4 – **Severe feeling of urgency**: My urgency caused much discomfort. I had difficulty holding my urine: I had to stop my activity or task and hurry to the toilet to avoid a wetting accident
5 – **Unable to hold; leak urine**: I had a wetting accident before reaching the toilet.

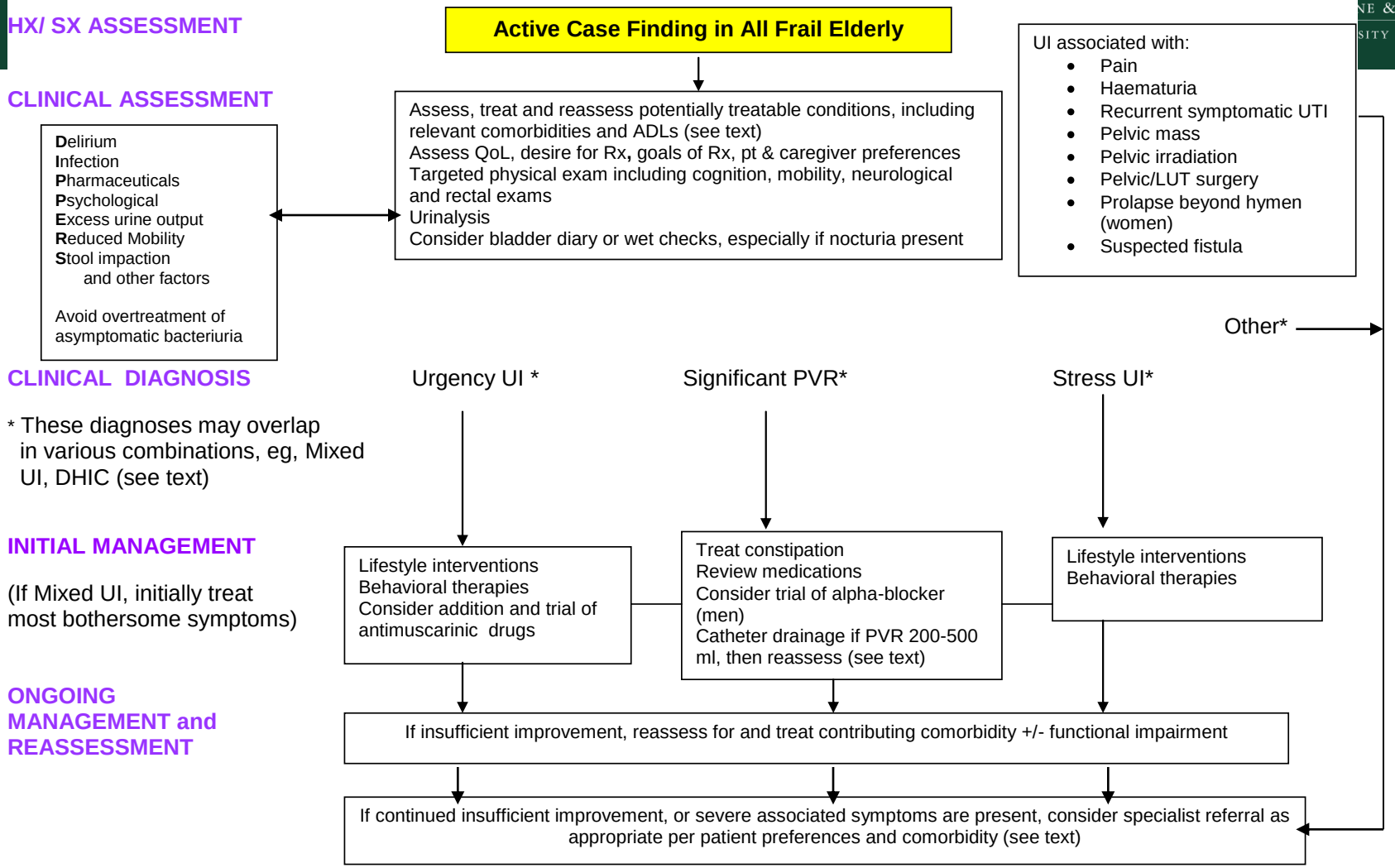
Please tick the "S" column if you leak urine accidently with exertion, or are wet without realising it.

	DAY ONE			DAY TWO			DAY THREE		
	Volume (or tick)	Urgency score	S	Volume (or tick)	Urgency score	S	Volume (or tick)	Urgency score	S
Midnight									
1 am									
2 am									
3 am									
4 am									
5 am									
6 am									
7 am									
8 am									
9 am									
10 am									
11 am									
Midday									
1 pm									
2 pm									
3 pm									
4 pm									
5 pm									
6 pm									
7 pm									
8 pm									
9 pm									
10 pm									
11 pm									

Make a diagnosis!



MANAGEMENT OF URINARY INCONTINENCE IN FRAIL OLDER PERSONS



Which conservative interventions work in older people?

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- 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

Prompted 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

Schnelle JF, Truaghber B, Sowell MA, Newman DR, Petrilli CO and Ory M.. *J Amer Geriatr Soc* 1989; 37: 1051-1057.

- The best predictors of responsiveness to prompted voiding in nursing home residents were
  - the ability to ambulate independently
  - appropriate toileting rates $\geq$ 66%
  - wet rate of $\leq$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

Colling JC, Ouslander J, Hadley BJ, Eisch J, Campbell E. *J Amer Geriatr Soc* 1992; 39: 135-141

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

Hu T et al. *JAMA* 1989; 262: 2656-2662.

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

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

Burgio K et al. Behavioural versus drug treatment for urge urinary incontinence in older women. A randomized controlled trial. Jam Med Assoc 1998; 280: 1995-2000

Combined behavioural and drug therapy for urge incontinence in older women. Burgio K, Locher JL, Goode PS. J American Geriatrics Society 2000; 48: 370-374.

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

Lechevallier-Michel N et al. Br J Clin Pharmacol 2005; 59: 143–51.

Serum anticholinergic levels

Ranked according to frequency of prescriptions in older adults

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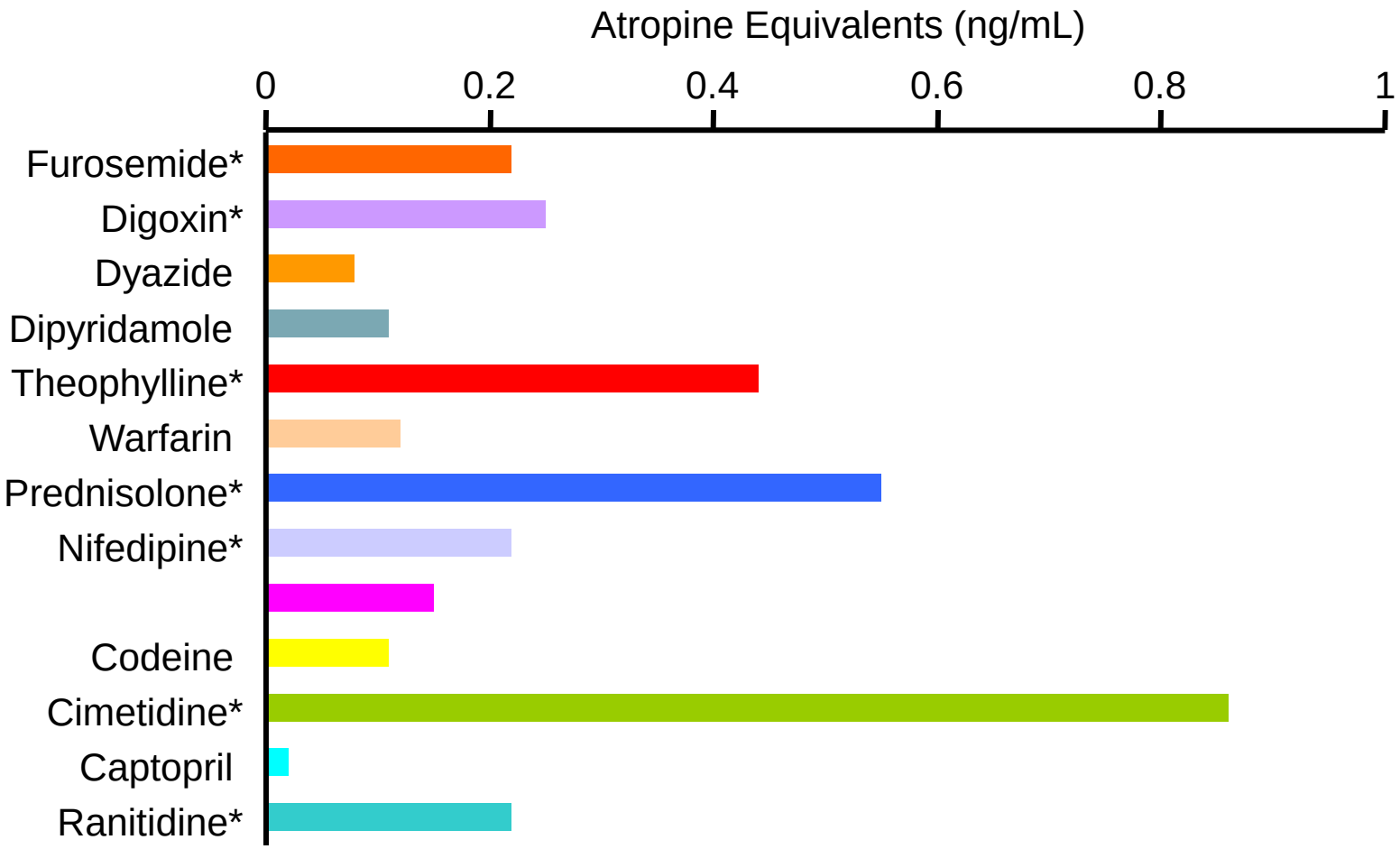


*Medications with the five highest levels of anticholinergic activity.

Tune LE, et al. Am J Psychiatry. 1992;149:1393–4.

Drugs

- Nocturia / nocturnal polyuria
  - Late afternoon diuretics
  - NSAID
  - DDAVP (NB: elderly)
  - (imipramine)

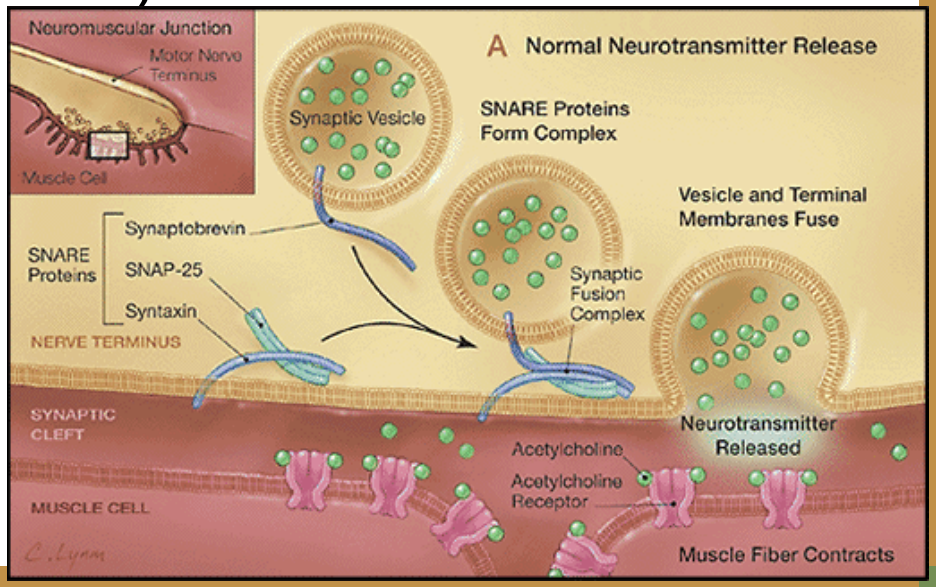
Drugs

- 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

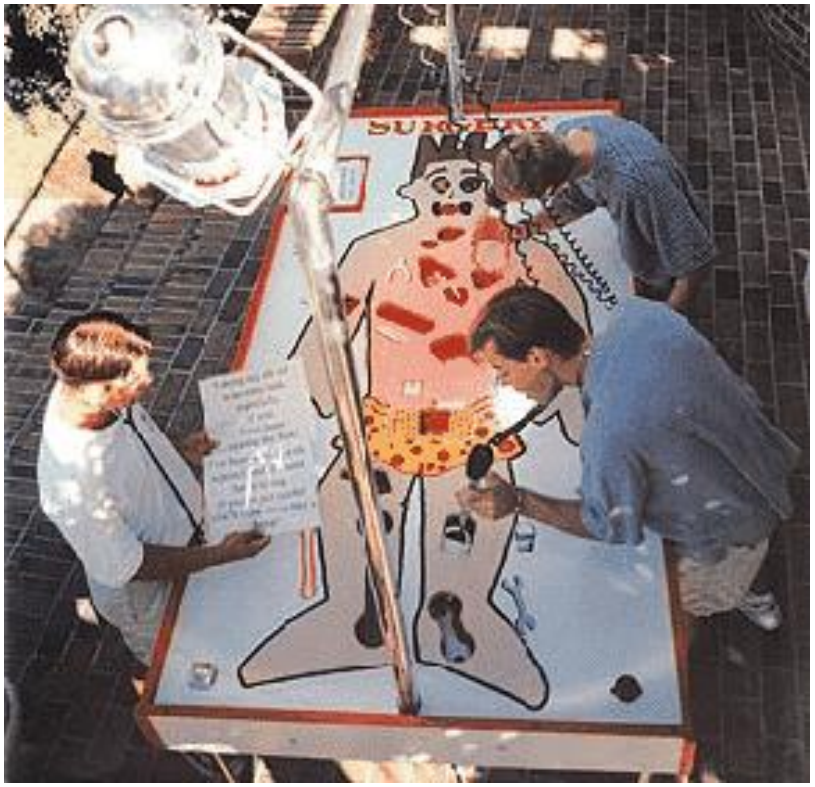
LUTS ≠ prostate!!

JAMA. 2006 Nov 15;296(19):2319-28

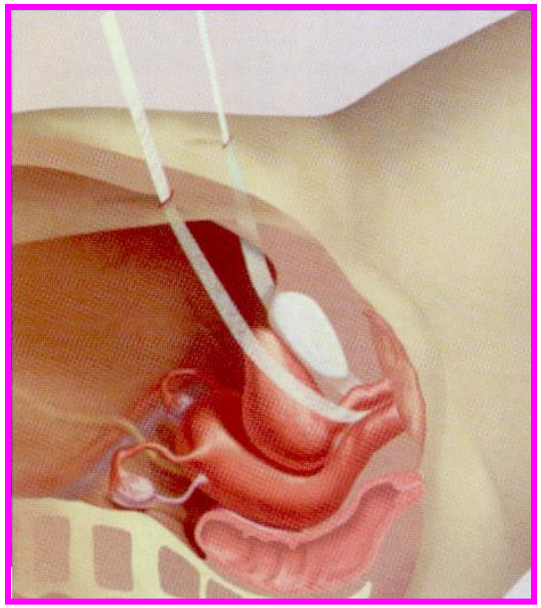
BJU Int. 2006 May;97(5):1003-6.

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.

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- 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

J Am Geriatr Soc. 2007 Dec;55(12):1927-31.

- Improved quality of life[1]
- TVT surgery showed a significant improvement in QOL, patient satisfaction and less urinary problems[2]

1. Am J Obstet Gynecol. 2007 Dec;197(6):680.e1-5
2. Neurourol Urodyn. 2007;26(7):990-4

Pads, appliances catheters

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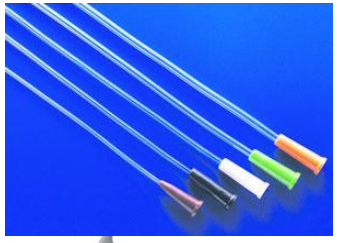
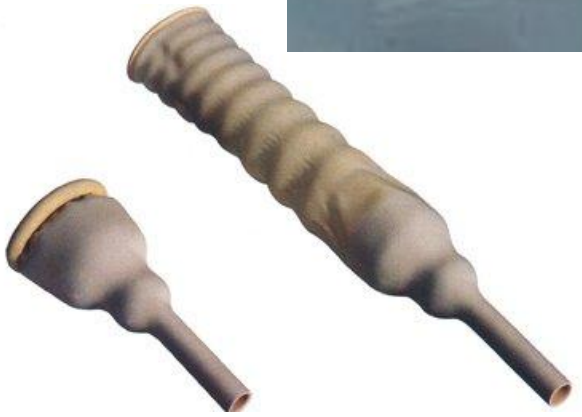
- All have a role
- Can form a pragmatic solution
- Individualised assessment warranted





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