

# Urinary Incontinence in Older Adults: Taking a Patient Centered Approach

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We would like to acknowledge that we are gathered today on the traditional territories of the Musqueam, Squamish and Tsleil-Waututh peoples.

Source: [www.johomaps.net/na/canada/bc/vancouver/firstnations/firstnations.html](http://www.johomaps.net/na/canada/bc/vancouver/firstnations/firstnations.html)



# Objectives

1. Review the **normal physiological changes** of aging that occur in the lower urinary tract.
2. Consider how **medical comorbidities** and **medications** can contribute to urinary incontinence.
3. Discuss evidence-based **non-pharmacological treatments** for overactive bladder and their utility for different patient populations of older adults.
4. Review **pharmacological treatments** for overactive bladder in older adults, considering appropriateness based on the individual patient characteristics.

# Spread the Word!

Urinary incontinence is NOT a  
normal part of aging!!!



# Aging and UI

- Very little longitudinal data to support increase in lower urinary tract symptoms (LUTS) with aging + physiological changes with aging
- Cross-sectional studies (EPIC, EPICONT)
  - Increasing prevalence of LUTS
  - Transition from urgency → urgency incontinence → detrusor failure
- Difficult to separating effects of declining estrogen and aging
  - Pelvic organs and their surrounding structures are estrogen responsive
  - Menopause if a major risk factor for developing pelvic floor disorders (epidemiological studies)
  - LUTS and LUTS severity increase after menopause

**Tab. III.** Prevalence (%) of overactive bladder by age of women [15]

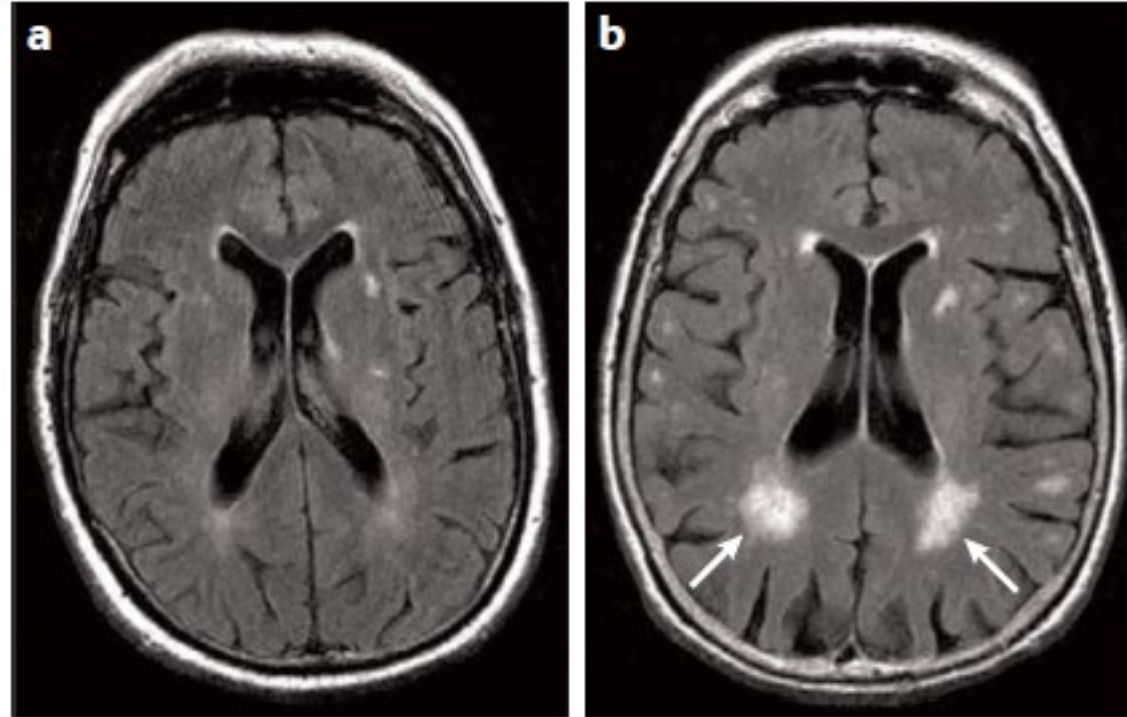
Age (years)	Prevalence (%)
18-29	5.9
30-39	4.2
40-49	8.5
50-59	11.8
60-69	12.3
70-79	15.6
Age-standardized	8.6

- Most significant increase in OAB wet
- Most significant increase in OAB severity between 60-69yo
- Nocturia most bothersome symptoms for woman (>urgency or urgency incontinence)

# Urination: Physiological changes with aging

- Bladder
  - Decreased capacity
  - Decreased sensation to filling
  - Increased detrusor overactivity
  - Decreased contractile function
  - Increased residual
- Decreased urethral closure pressure (women)
- Increased night-time urine production (blunting of ADH peak)
- Altered central and peripheral neurotransmitter concentrations/actions
- Increased white matter hypodensities in the brain

# The Brain and UI



Increased periventricular WM= Increased incidence of LUTS  
+ LUTS severity



# Associated conditions and UI

- Peripheral vascular disease
  - Diabetes mellitus
  - Congestive heart failure
  - Venous insufficiency
  - Chronic lung disease
  - Falls and contractures
  - Sleep disordered breathing ✓
  - Stroke
- Dementia
  - Diffuse Lewy body disease
  - Parkinson's disease
  - Normal Pressure Hydrocephalus
  - Recurrent infection
  - Constipation
  - Obesity ✓

# Culprit medications

- ACEI- cough (SUI)
- Anticholinergics- impaired bladder emptying, constipation, sedation
- Calcium channel blockers- impaired emptying, constipation, leg edema
- Cholinesterase inhibitors- increase bladder contractility
- Diuretics- increase urinary frequency
- Lithium- polyuria
- Opioids- impaired bladder contractility, constipation, sedation

# Culprit medications

- Psychotropics (benzodiazepines, antipsychotics, z-drugs, trazadone)-  
sedation, enuresis
  - Many also have anticholinergic effects (ex. quetiapine, trazadone)
- SSRIs- increase bladder contractility, decreased tone of the urethral  
sphincter (increases cholinergic transmission)
- Gabapentin/pregabalin-leg edema
- NSAIDs- leg edema

# Case Example

# Case 2: Ms. G



- 88yo female, living in Assisted Living for 5 years after a fall and hip fracture
- Needs help for bathing, dependent IADLs
- Mobilizes with 4-wheeled walker
- Loves to play bridge, spending time with her Yorkie Maisey
- Urinary symptoms:
  - Frequency- 9x/day, 1-2x/night (with enuresis)
  - Urgency with urgency incontinence if waits >5min past urge to void
  - Leaking with coughing and sneezing
  - No hesitancy, no sensation of incomplete emptying
  - 3-4 pads/day, large pad on bed at night
  - Daily BM but hard (Bristol Stool Chart 1-2)
  - Bother/QOL- stopped going on outings with friends

Ms. G.



- **Past medical history:**

- CAD (NSTEMI 2011, 2016)
- HTN
- Dyslipidemia
- TIA (2009)
- CHF (EF 40%)
- GERD
- Depression
- Anxiety



Ms. G.

## ■ Medications



■ Ramipril 10 mg po daily



■ Furosemide 80 mg po daily



■ Amlodipine 5mg po daily

■ Bisoprolol 5 mg po daily

■ Atorvastatin 20 mg po daily

■ ASA 81 mg po daily

■ Alendronate 70mg po weekly



■ Amitriptyline- 20mg po qhs



■ Clonazepam- 0.5mg po qhs



■ Calcium 1250mg po bid



■ Ferrous fumarate 300mg po daily

# Physical exam



- Independent for transfers, unable to rise without use of arms
- Timed up-and-go 18 seconds
- BP 120/70 lying, 106/66 standing
- Bilateral pitting leg edema
- Sacral innervation intact
- Anal wink intact, anal tone present but weak, hard stool on DRE
- Perineum excoriated, no sacral wounds, no prolapse
- Weak pelvic floor muscles
- Positive stress test in the supine position
- Post-void residual urine volume 50 mL



## Investigations

GFR 50

HbA1C= 6.2%

Urinalysis negative

# What Type of Incontinence?

- Urgency incontinence
- Stress incontinence
- Functional incontinence

**Multifactorial Incontinence**

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Treatment

## Clinical Frailty Scale\*



**1 Very Fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.



**2 Well** – People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g. seasonally.



**3 Managing Well** – People whose medical problems are well controlled, but are **not regularly active** beyond routine walking.



**4 Vulnerable** – While **not dependent** on others for daily help, often **symptoms limit activities**. A common complaint is being "slowed up", and/or being tired during the day.



**5 Mildly Frail** – These people often have more **evident slowing**, and need help in **high order IADLs** (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.



**6 Moderately Frail** – People need help with **all outside activities** and with **keeping house**. Inside, they often have problems with stairs and need **help with bathing** and might need minimal assistance (cuing, standby) with dressing.



**7 Severely Frail** – **Completely dependent for personal care**, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).



**8 Very Severely Frail** – **Completely dependent**, approaching the end of life. Typically, they could not recover even from a minor illness.



**9 Terminally Ill** - Approaching the end of life. This category applies to people with a **life expectancy <6 months**, who are not otherwise evidently frail.

### Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

\* I. Canadian Study on Health & Aging, Revised 2008.  
Z.K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.

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# Lifestyle interventions

1. No recommendations are possible regarding lifestyle interventions for UI in the frail elderly (Level 4)

-  
Best evidence- Increased hydration for incontinent frail elderly may decrease UI

# Behavioral modifications

- Prompted voiding
  - May be effective in nursing home and home care
  - Ineffective if need more than 1PA for transfer
  - Do not continue if <20% reduction in wet checks or toilet successfully <2/3 of times after 3 day trial
- Timed voiding- insufficient evidence
- Habit retraining- insufficient evidence
- No proven interventions for night-time UI or UI in hospitalized patients

# Behavioural interventions

- **Pelvic floor muscle training (PFMT)**
  - Effective as a **stand-alone treatment**, as part of a **multi-component strategy**
  - PFMT may be **just as effective as drug therapy** and that combination of drug therapy + PFMT more effective than either treatment alone
  - **Supervised PFMT** should be offered as a **first-line conservative therapy for women of all ages with UI** (Level 1 evidence, Grade A recommendation)

# Behavioural interventions

## **Scheduled voiding regimens:**

- **Bladder training (BT)**- should be recommended as a **first-line conservation therapy** for UI in women
  - Start with 1hr intervals and increase by 15-30min intervals until q2-3hr voiding intervals achieved
  - Consider self-monitoring with diary/log
  - Importance of supervising HCP
  - Consider different strategy if no improvement after 3 weeks
  - BT likely as effective as drug therapy



# Behavioral interventions

- **Behavioural interventions + physical activity** (Talley et al, 2017)
  - 42 cognitively intact elderly females (mean age 84.9)
  - Frail- >3 on Vulnerable Elders Survey, slow gait speed/assistive device
  - Single-blind, two-arm pilot RCT
  - Intervention- 12 week program:
    - Customized behavioral treatments
    - 150 minutes/week of walking
    - 2x/week strength training

## Contributing Factors

## Interventions

## Outcomes

### Urologic Symptoms

- Weak pelvic floor muscles
- Urinary frequency
- Urinary urgency
- Bladder irritants
- Medication side effects



### Tailored Behavioral Incontinence Strategies

- Pelvic floor muscle exercises
- Bladder training
- Urge suppression
- Eliminate bladder irritants
- Adequate fluid intake
- Constipation prevention
- Reducing nocturia
- Medication education



### Primary Outcomes

- Improved urinary incontinence severity

### Secondary Outcomes

- Improved toileting skills
- Improved gait speed
- Improved balance
- Improved lower extremity strength

### Tertiary Outcomes

- Improved incontinence-related quality of life

### Functional Impairments Affecting Toileting Skills

- Slow gait speed
- Poor mobility
- Weak lower extremities



### Physical Activity to Improve Toileting Skills

- Walking
- Lower extremity strength training



# Behavioral interventions

- Population- mean age 84.9, 98% white, 83% living independently, 62% mixed UI and 22% urgency
- Results
  - 50% decrease in daily leaks (bladder diary)
  - “Overall do you feel you are better?- 81% treatment group vs. 36% control
  - % improvement- 65% treatment group vs. 34% control
  - Greater improvement in self-reported and objectively measured toilet skills + in balance and gait speed (not statistically significant)
  - No difference in improvement in QOL

# Treatment

- **Skin protection**

- Barrier cream
- Avoiding long periods of wetness

- **Treat constipation**

- Daily PEG/lactulose (increase frequency prn to achieve 1 soft BM/day)
- Stop Calcium and Iron

- **Increase fluid intake**

- **Physical exercise + behavioural interventions, including individual work with a pelvic floor physiotherapist**

# Treatment

- **Medication review**

- Lasix at 4pm, consider adjusting dose if able
- Stop Amlodipine (BP too low for level of frailty)
- Taper off Amitriptyline- monitor mood
- Taper off Clonazepam (VERY slowly)

- **?Pharmacological therapy for incontinence?**

- Anticholinergic
- Beta-3 agonist

# Pharmacological Rx for OAB

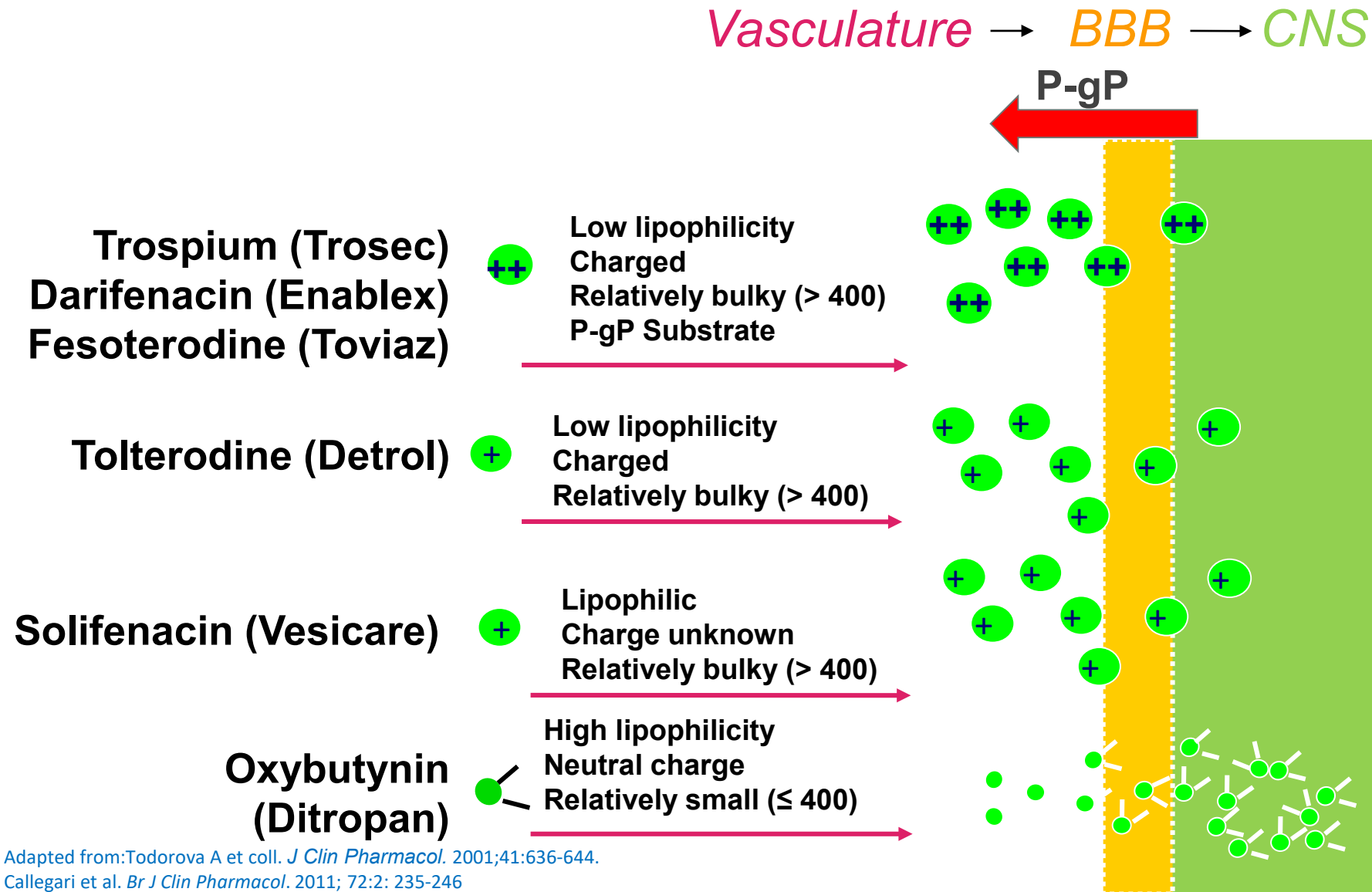
## ■ Antimuscarinics:

- Oxybutynin (Ditropan)
- Tolterodine (Detrol)
- Darifenacin (Enablex)
- Solifenacin (Vesicare)
- Fesoterodine (Toviaz)
- Trospium (Santura)

## ■ Beta-3 agonist:

- Mirabegron (Myrbetriq)

# Anticholinergic Agents for OAB: Potential Crossing of Blood-Brain Barrier



Adapted from: Todorova A et coll. *J Clin Pharmacol.* 2001;41:636-644.

Callegari et al. *Br J Clin Pharmacol.* 2011; 72:2: 235-246

Chancellor MB et al. *Drugs Aging.* 2012 April; 29(4):259-273

*Geriatr Gerontol Int* 2015; 15: 521–534

REVIEW ARTICLE

# Effect of pharmacological treatment for urinary incontinence in the elderly and frail elderly: A systematic review

Eva Samuelsson,<sup>1</sup> Jenny Odeberg,<sup>2</sup> Karin Stenzelius,<sup>3</sup> Ulla Molander,<sup>4</sup> Margareta Hammarström,<sup>5</sup> Karin Franzen,<sup>6</sup> Gunnel Andersson<sup>6</sup> and Patrik Midlöv<sup>7</sup>

- 13 trials of high/moderate quality
  - 11- Antimuscarinic
  - 2- Duloxetine



# Systematic review- pharmacological Rx elderly/frail elderly

## **Results**

- Oxybutynin (only drug studied in frail elderly at time of publication)- no effect on UI or QOL (4 trials)
- Other anticholinergics (Darifenacin, Fesoterodine, Solifenacin, Tolterodine, Trospium)- decrease in UI (mean= 1/2 leak/24hrs) (7 trials)
  - Adverse effects- dry mouth, constipation
- Data insufficient for quality of life, cognitive effects
- Data insufficient for Duloxetine (SUI)
- No studies on Mirebegron or estrogen (at time of publication)

# FORTA Classifications

<b>Class A (absolutely)</b>	Indispensable drug, clear-cut benefit in terms of efficacy/safety ratio proven in elderly patients for a given indication
<b>Class B (beneficial)</b>	Drugs with proven or obvious efficacy in the elderly, but limited extent of effect or safety concerns
<b>Class C (careful)</b>	Drugs with questionable efficacy/safety profiles in the elderly, to be avoided or omitted in the presence of too many drugs, lack of benefits or emerging side effects; review/find alternatives
<b>Class D (don't)</b>	Avoid in the elderly, omit first, review/find alternatives

# LUTS FORTA Classification: OAB drugs

## Class A (absolutely)

Indispensable drug, clear-cut benefit in terms of efficacy/ safety ratio proven in elderly patients for a given indication

## Class B (beneficial)

Drugs with proven or obvious efficacy in the elderly, but limited extent of effect or safety concerns

## Class C (careful)

Drugs with questionable efficacy/safety profiles in the elderly, to be avoided or omitted in the presence of too many drugs, lack of benefits or emerging side effects; review/find alternatives

## Class D (don't)

Avoid in the elderly, omit first, review/find alternatives

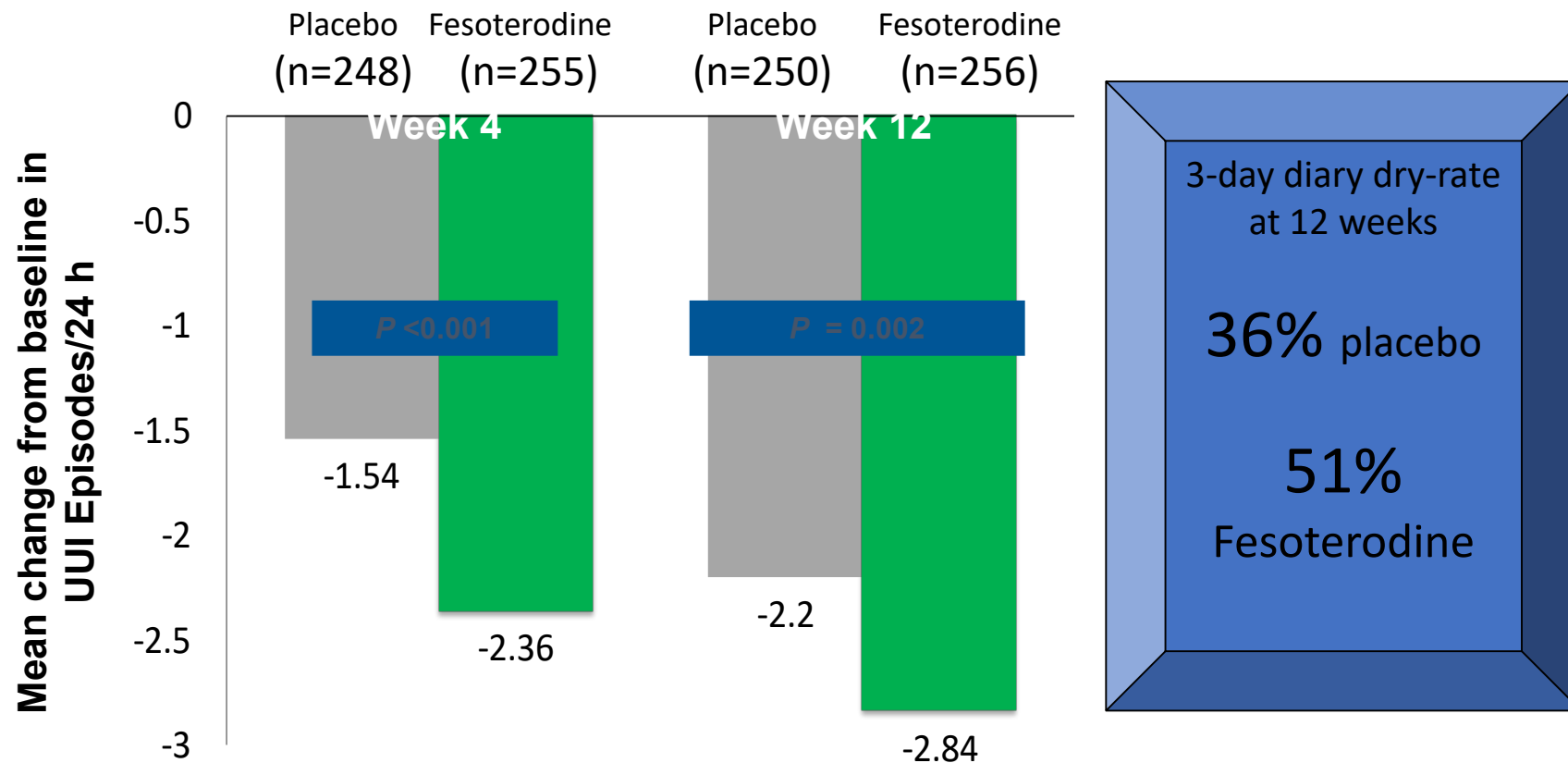
- Fesoterodine

- Darifenacin
- Mirabegron
- Extended-release oxybutynin
- Solifenacin
- Tolterodine
- Trospium

- Immediate release oxybutynin
- Propiverine

# Fesoterodine in the Frail Elderly

562 frail elderly with urgency urinary incontinence, average age 75 (range 65-91), cognitively intact, with a mean of 8-9 health conditions, 1-in-4 taking  $\geq 11$  meds



**Table 3.** Treatment emergent AEs with an incidence exceeding the placebo rate and occurring in 2% or more of subjects

	No. Placebo (%)	No. Fesoterodine (%)
Subjects with AEs	120 (42.7)	158 (56.2)
Discontinued due to AEs	14 (5.0)	26 (9.3)
Dry mouth*	17 (6.0)	66 (23.5)
Constipation	12 (4.3)	31 (11.1)†
Urinary retention	0	9 (3.2)‡
Diarrhea	7 (2.5)	8 (2.8)
Fatigue	3 (1.1)	8 (2.8)
Dyspepsia	1 (0.4)	7 (2.5)
Headache	5 (1.8)	7 (2.5)
Cough	2 (0.7)	7 (2.5)

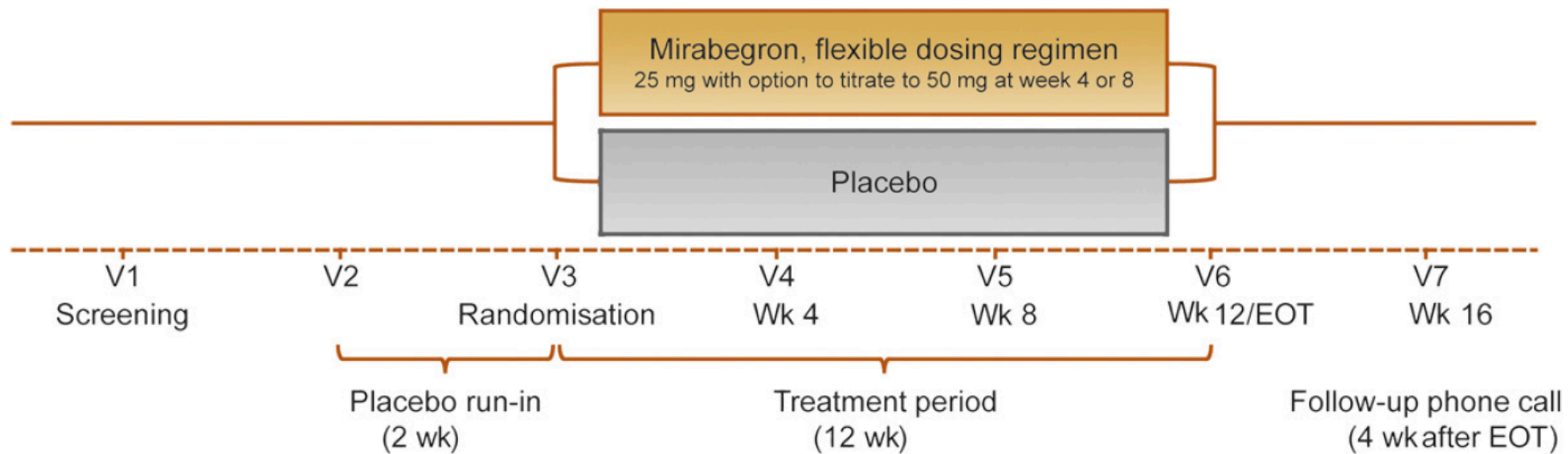
\* Reported as severe by 2 subjects in the fesoterodine group and 1 in the placebo group.

† Reported as severe by 1 subject in the fesoterodine group.

‡ Catheterization required by 3 (1%) subjects with urinary retention.

# **Efficacy, safety, and tolerability of mirabegron in patients aged $\geq 65$ yr with overactive bladder wet: a phase IV, double-blind, randomised, placebo-controlled study (PILLAR)**

*Adrian Wagg<sup>a,\*</sup>, David Staskin<sup>b</sup>, Eli Engel<sup>c</sup>, Sender Herschorn<sup>d</sup>, Rita M. Kristy<sup>e</sup>, Carol R. Schermer<sup>e</sup>*



**Fig. 1 – Study flow diagram. EOT = end of treatment (week 12).**

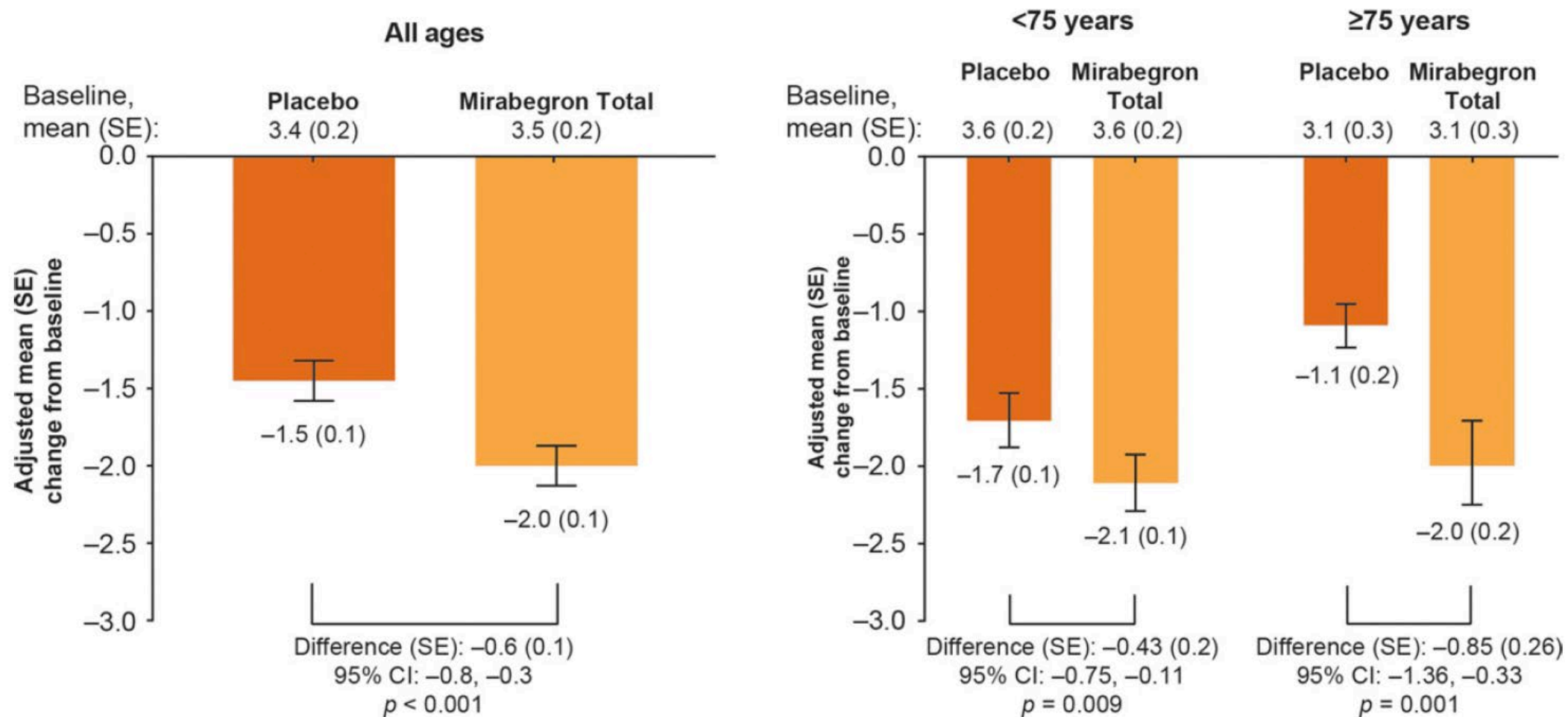
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**Table 1 – Baseline demographic and OAB characteristics.**

Demographic characteristics (safety analysis set)	Placebo (n = 442)	Mirabegron 25 mg <sup>a</sup> (n = 226)	Mirabegron 50 mg <sup>a</sup> (n = 219)	Mirabegron total (n = 445)
Female sex, n (%)	324 (73)	168 (74)	149 (68)	317 (71)
Age, mean ± SD	71.9 ± 6.0	71.6 ± 5.8	71.7 ± 5.2	71.7 ± 5.5
Age ≥75 yr, n (%)	124 (28)	66 (29)	59 (27)	125 (28)
BMI category, n (%)				
<25	91 (21)	60 (27)	48 (22)	108 (24)
≥25–<30	150 (34)	84 (37)	73 (33)	157 (35)
≥30	201 (46)	82 (36)	98 (45)	180 (40)
Race, n (%)				
White	357 (81)	151 (67)	197 (90)	348 (78)
Asian	54 (12)	58 (26)	1 (0.46)	59 (13.3)
Black or African American	25 (5.7)	16 (7.1)	17 (7.8)	33 (7.4)
Other	6 (1.4)	1 (0.4)	4 (1.8)	5 (1.1)
MoCA total score category, n (%) <sup>b</sup>				
Normal (≥26)	305 (69)	168 (74)	142 (65)	310 (70)
Mild (18–25)	103 (23)	44 (20)	68 (31)	112 (25)
Moderate (10–17)	3 (0.68)	1 (0.44)	2 (0.91)	3 (0.67)
Severe (<10)	0	0	0	0
Missing	29 (6.6)	13 (5.8)	5 (2.3)	18 (4.1)
Medical history, most frequent conditions, n (%) <sup>c</sup>				
Hypertension	243 (55.0)	134 (59.3)	125 (57.1)	259 (58.2)
Osteoarthritis	173 (39.1)	60 (26.5)	87 (39.7)	147 (33.0)
Hypertonic bladder <sup>d</sup>	145 (32.8)	86 (38.1)	72 (32.9)	158 (35.5)
Gastro-oesophageal reflux disease	135 (30.5)	54 (23.9)	77 (35.2)	131 (29.4)
OAB characteristics (full analysis set–incontinence)	Placebo (n = 431)	Mirabegron 25 mg <sup>a</sup> (n = 220)	Mirabegron 50 mg <sup>a</sup> (n = 217)	Mirabegron total (n = 437)
Duration of symptoms (mo), mean ± SD	120 ± 112	119 ± 119	123 ± 113	121 ± 116
Number of micturitions/24 h, mean ± SD <sup>e</sup>	10.5 ± 3.1	10.7 ± 2.3	10.5 ± 2.5	10.6 ± 2.4
Number of incontinence episodes/24 h, mean ± SD <sup>e</sup>	3.4 ± 3.2	3.2 ± 3.1	3.7 ± 3.1	3.5 ± 3.1
Number of urgency episodes/24 h, mean ± SD <sup>e,f</sup>	5.8 ± 3.9	6.7 ± 3.9	5.0 ± 3.0	5.9 ± 3.6
Number of urgency incontinence episodes/24 h, mean ± SD <sup>e</sup>	3.4 ± 3.1	3.2 ± 3.1	3.7 ± 3.1	3.4 ± 3.1
Mean volume voided/micturition (ml), mean ± SD	185 ± 75.2	175 ± 59.2	199 ± 90.1	186 ± 76.3



## B. Number of incontinence episodes/24 h\*



# Side effects

- UTI
- Headache
- Diarrhea
- Nausea
- No change in MOCA scores

# ?Pharmacological treatment


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- Trial non-pharmacological symptoms + medication reduction/discontinuation x 6-8 weeks
- Treat constipation
- Brain problem vs. lower urinary tract problem??
- Reassess degree of bother and effects on QOL
- Consider trial of anticholinergic or Mirabegron
- Follow-up in 2-3 months

# Conclusions

- Urinary incontinence is **NOT a normal part of aging** but physiological changes in the lower urinary tract do occur
- The approach to UI must be **individualized**, and will depend on the patient's degree of **frailty, medical comorbidities and medications**
- **Non-pharmacological treatments** should be offered to **all patients** and tailored to their individual profile, considering **frailty and cognitive status**
- **Pharmacological therapies** can be considered based on **response to non-pharmacological treatments, bother and medical, functional and cognitive profile**



Thank you! Questions?