

MIXED URINARY INCONTINENCE (MUI)

MUI is broad and may refer to equal stress and urgency symptoms, stress-predominant symptoms, urgency-predominant symptoms, urodynamic stress urinary incontinence (USUI) with detrusor overactivity (DO), or USUI with clinical urgency symptoms but no DO. This broad definition leads to inconsistencies when evaluating treatment options and outcomes.

1. Epidemiology, aetiology, pathophysiology

Prevalence rates vary widely due to inconsistent reporting of urinary incontinence (UI) subtypes.

MUI is the second most common form of UI after stress urinary incontinence (SUI), with a 7.5–25% prevalence, and approximately one-third of women with UI have MUI. Subjective questionnaires often classify more women as MUI than objective urodynamic findings.

MUI is caused by a combination of factors responsible for SUI and urgency urinary incontinence (UUI), including oestrogen deficiency, histomorphological abnormalities, and microstructural changes. One hypothesis suggests that an incompetent sphincter and bladder neck allow urine to enter the proximal urethra during stress, triggering involuntary detrusor contraction. Another theory suggests that urine flow across the urethral mucosa increases the excitability of the micturition reflex. Multiple disturbances are involved.

2. Diagnostic Evaluation

Assessment starts with a thorough history and categorisation into stress-predominant or urgency-predominant MUI.

MUI includes many urodynamic phenotypes: provoked detrusor contractions, unprovoked detrusor contractions, or no abnormal detrusor contractions despite leakage with urgency. Some women experience urgency but no UUI because the urethral sphincter prevents leakage.

The role of urodynamics is unclear but may help establish objective degrees of SUI and DO and assist decision-making.

Recommendations	Strength rating
Complete a thorough history and examination as part of the assessment of mixed urinary incontinence (MUI).	Strong
Characterise MUI as either stress-predominant or urgency-predominant where possible.	Weak
Use bladder diaries and urodynamics as part of the multimodal assessment of MUI to help inform the most appropriate management strategy.	Strong

3. Disease management

Managing MUI is challenging due to more severe symptoms and variable responses compared to SUI or UUI. Conservative strategies are recommended initially; surgery is considered a last-resort option.

CONSERVATIVE MANAGEMENT

• Pelvic floor muscle training (PFMT)

PFMT reduces frequency of incontinence episodes and improves quality of life. It improves pelvic floor muscle (PFM) strength and decreases UI episodes compared to no treatment.

• Bladder training (BT)

BT and PFMT are effective first-line therapies. Combining BT with PFMT provides superior outcomes for symptom improvement and cure rates.

• Electrical stimulation (ES)

ES has been explored for SUI and stress-predominant MUI. Evidence varies, and PFMT, BT, and possibly ES are effective initial approaches; surgery remains an alternative for refractory cases.

Recommendations	Strength rating
Treat the most bothersome symptom first in patients with mixed urinary incontinence (MUI).	Weak
Offer bladder training as a first-line therapy to adults with MUI.	Strong
Offer supervised intensive pelvic floor muscle training, lasting at least three months, as a first-line therapy to all women with MUI (including elderly and postnatal women).	Strong

PHARMACOLOGICAL MANAGEMENT

Few trials report outcomes separately for MUI.

• Anticholinergics

Effective for improvement of the UUI component, regardless of associated SUI.

• Mirabegron

A beta-3 adrenergic agonist that reduces voiding frequency and improves overactive bladder (OAB) symptoms and quality of life, with minimal effect on urgency.

• Duloxetine

A serotonin-noradrenaline reuptake inhibitor (SNRI) effective for improvement of incontinence and QoL in all MUI subgroups, though adverse event rates are high.

Recommendations	Strength rating
Treat the most bothersome symptom first in patients with mixed urinary incontinence (MUI).	Weak
Offer anticholinergic drugs or beta-3 agonists to patients with urgency-predominant MUI.	Strong
Offer duloxetine (where licensed) to selected patients with stress-predominant MUI unresponsive to other conservative managements and who want to avoid invasive treatment, counselling carefully about the risk of adverse events.	Weak

SURGICAL MANAGEMENT

Surgical management options for MUI use the same procedures as SUI.

Evidence specific to MUI is limited, and outcomes appear less favourable when pre-operative urgency is present. Greater urgency severity correlates with higher risk of treatment failure after MUS, though some earlier data suggest comparable results in cases with DO.

Combining surgery with botulinum toxin A may improve continence and QoL in selected patients.

Evidence from single-incision slings applies mainly to SUI, and further research on well-defined MUI subtypes is needed.

Recommendations	Strength rating
Treat the most bothersome symptom first in patients with mixed urinary incontinence (MUI).	Weak
Warn women that surgery for MUI is less likely to be successful than surgery for stress urinary incontinence alone.	Strong
Inform women with MUI that one single treatment may not cure urinary incontinence; it may be necessary to treat other components of the incontinence problem as well as the most bothersome symptom.	Weak