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European Association of Urology

Guidelines

EAU Guidelines on Assessment and Nonsurgical Management of Urinary Incontinence

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Abstract

Context: The previous European Association of Urology (EAU) guidelines on urinary incontinence comprised a summary of sections of the 2009 International Consultation on Incontinence. A decision was made in 2010 to rewrite these guidelines based on an independent systematic review carried out by the EAU guidelines panel, using a sustainable methodology.
Objective: We present a short version of the full guidelines on assessment, diagnosis, and nonsurgical treatment of urinary incontinence, with the aim of increasing their dissemination.
Evidence acquisition: Evidence appraisal included a pragmatic review of existing systematic reviews and independent new literature searches, based on Population, Intervention, Comparator, Outcome questions. Appraisal of papers was carried out by an international panel of experts, who also collaborated on a series of consensus discussions, to develop concise structured evidence summaries and action-based recommendations using a modified Oxford system.
Evidence summary: The full version of the guidelines is available online (http://www.uroweb.org/guidelines/online-guidelines/). The guidelines include algorithms that refer the reader back to the supporting evidence, and they are more immediately useable in daily clinical practice.
Conclusions: These new guidelines present an up-to-date summary of the available evidence, together with clear clinical algorithms and action-based recommendations based on the best available evidence. Where such evidence does not exist, they present a consensus of expert opinion.
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1. Introduction

We present a shortened version of the 2012 guidelines from the European Association of Urology (EAU) Working Panel on Urinary Incontinence (www.uroweb.org/guidelines/online-guidelines/) to encourage further dissemination. This paper focuses on assessment, diagnosis, and conservative and drug therapy, but it excludes surgical management, which will be

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covered in a separate publication. The guidance is written by urologists for urologists, and it aims to provide clear practical guidance on the clinical care of people with urinary incontinence (UI). Care of people with neurologic UI is covered by other EAU guidelines [1]. The guidance does not encompass background topics such as causation, epidemiology, and psychology. Nor does it review evidence on the prevention of UI or the management of urinary fistula, but these issues will be fully addressed in future iterations. Our aim was to provide (1) a clear algorithm to guide care for people presenting with UI to use as a basis for thinking through patient management and planning and designing clinical services, (2) a concise structured referenced summary of current evidence on clinical topics, and (3) clear recommendations on what to do or not to do in most clinical circumstances. If possible, these are evidence based, but for practice areas for which there is little or no high-level evidence, we provide an expert view from panel consensus.

The guidance focuses on uncomplicated patients but recognises that many patients have relevant comorbidity that affects the available treatment options and management decisions.

Table 1 – Recommendations for history taking and physical examination

	Grade
Take a history:	A*
• Type of incontinence (stress, urgency, or mixed)	
• Timing and severity	
• Associated urinary symptoms	
• Obstetric and gynaecologic history	
• Relevant comorbidities including cognitive impairment	
• Medication review	
Do a physical examination:	A*
• Abdominal examination to detect abdominal or pelvic mass	
• Perineal examination	
• Digital, vaginal, or rectal examination	
• Assess oestrogenisation status in women	
• Assess voluntary pelvic floor contraction	
Consider early referral for further assessment:	A*
• Urinary incontinence associated with pain	
• Visible haematuria	
• Recurrent urinary tract infection	
• Previous pelvic surgery or radiotherapy	
• Constant leak suspicious of fistula	
• Voiding difficulty	
• Suspicion of neurologic disease	

* Given grade A because, despite absence of evidence, expert opinion assigns absolute importance to these steps.

2. Methodology

The guidance was formulated using standard evidence-based methodology. Every topic was defined as a precise clinical question, expressed in Population, Intervention, Comparator, Outcome (PICO) format [2] that formed the basis of the individual literature search strategies.

Several high-quality systematic reviews, evidence-based guidelines, and some extensive narrative reviews have been produced recently using systematic PICO-based searches. Given the size of the task and our limited resources, we used the summarised evidence and identified literature from these as our source of evidence up to the cut-off date. We then performed, for each PICO, our own tailor-made searches from the cut-off date of the most recent review to our own cut-off date of July 2010. We searched Medline, Embase and the Cochrane Library and considered only English-language articles. We identified 3243 abstracts that were independently assessed by two panel members who selected 403 relevant studies.

Each PICO was assigned to a panel member, who extracted the evidence from each selected full-text paper for incorporation into a dedicated database. Further discussion on each topic led to the development of summary statements that aimed to synthesise relevant clinical messages using levels of evidence (LEs) standardised by the EAU and led to phrasing of action-based recommendations, graded according to EAU standards (see full-text guidelines in the methodological section). These make it clear what the clinician should or should not do in clinical practice.

This guidance is based on the best evidence available to the expert panel at the time of writing, but adherence does not guarantee best outcomes for individual patients. The need for clinical expertise when making treatment decisions for individual patients is paramount, taking into account the patient's personal values, preferences, and specific circumstances.

3. Assessment and diagnosis

For all diagnostic techniques, three questions need to be answered: (1) What is the technical accuracy of the test in terms of reproducibility and reliability? (2) What is its diagnostic accuracy compared to a standard? (3) What is its prognostic value?

3.1. History and physical examination

Taking a clinical history and performing a relevant thorough physical examination are fundamental to clinical care. Table 1 lists the important features of history taking and physical examination for the assessment of UI.

3.2. Patient questionnaires

There is no evidence that questionnaires or patient-reported outcome measures (PROMs) for assessment of adults with UI influence outcome (LE: 4). Symptom scores, symptom questionnaires, PROMs, or health-related quality-of-life measures are widely used to record symptoms and assess treatment benefit. The methodology for questionnaire development was reviewed by the 4th International Consultation on Incontinence in 2008 [3]. Although many studies have investigated the validity and reliability of questionnaires and PROMs, most have taken place in adults without UI.

3.3. Voiding diaries

Voiding diaries of 3–7 d duration are reliable for quantifying mean voided volume and daytime and nighttime frequency

Table 2 – Recommendations for voiding diaries

	Grade
Voiding diaries should be used to evaluate coexisting storage and voiding dysfunction in clinical practice and research.	A
Diary duration should be between 3 d and 7 d.	B

Table 3 – Recommendations for urinalysis and urinary tract infection

	Grade
Do urinalysis as a part of the initial assessment of a patient with urinary incontinence.	A
In a patient with urinary incontinence, treat a symptomatic urinary tract infection appropriately (see EAU guidelines on urological infections [10]).	A
Do not treat asymptomatic bacteriuria in elderly patients to improve urinary incontinence.	B

EAU = European Association of Urology.

(LE: 2b). The choice of diary duration appears to be based on the possible behavioural therapeutic effect of keeping a diary rather than on validity or reliability [4–7] (Table 2).

3.4. Urinalysis and urinary tract infection

There is no evidence that urinary tract infection (UTI) causes UI or that treating UTI cures UI (LE: 4), but the presence of symptomatic UTI does worsen the symptoms of UI (LE: 3) [8]. In contrast with symptomatic UTI, asymptomatic bacteriuria appears to have little influence on UI. Elderly nursing home patients with established UI do not benefit from the treatment of asymptomatic bacteriuria (LE: 2) [9]. For recommendations, see Table 3.

3.5. Postvoiding residual

Ultrasonography (US) provides an accurate estimate of postvoiding residual (PVR) (LE: 1b). Although most studies investigating PVR have not included patients with UI, there is a consensus that US is the best method of measuring PVR [11]. Lower urinary tract dysfunction is associated with a higher risk of PVR compared with controls (LE: 2). High PVR is not a risk factor for poor outcome in the management of UI (LE: 2) [12]. There is a lack of evidence to support the routine measurement of PVR in patients with UI. For recommendations, see Table 4.

Table 4 – Recommendations for postvoiding residual volume

	Grade
Postvoiding residual should be measured by ultrasound.	A
Measure postvoiding residual in patients with urinary incontinence and voiding dysfunction.	B
Measure postvoiding residual when assessing patients with complicated urinary incontinence.	C
Postvoiding residual should be monitored in patients receiving treatments that may cause or worsen voiding dysfunction.	B

3.6. Urodynamics

There is a consensus that urodynamic tests should aim to reproduce symptoms, and if not, the findings are inevitably inconclusive. There is also a consensus that attention to technical and methodological detail during urodynamic testing may increase the technical and diagnostic accuracy of urodynamics in recording usual bladder behaviour. In clinical practice, urodynamic testing (cystometry) may help to provide or confirm diagnosis, predict treatment outcome, or facilitate discussion during a consultation.

3.6.1. Technical accuracy

Most urodynamic parameters show a high random immediate- and short-term test–retest variability of up to ±15% in the same patient (LE: 2) [13–15]. Test–retest variability creates an overlap between so-called normal and abnormal populations, which may make it more difficult to categorise urodynamic findings in a particular individual (LE: 2).

Different techniques of measuring urethral function may perform reliably from one test to another but do not reliably correlate with other tests [16,17] or to the severity of UI (LE: 3). Measurement of leak point pressures has not been standardised, and evidence on whether there is correlation with UI severity or other measures of urethral function is conflicting [18–21].

3.6.2. Diagnostic accuracy

There may be inconsistency between history and urodynamic results (LE: 3). There is good inter- and intrarater reliability of videourodynamics for the severity and type of stress UI (SUI) [22]. However, the diagnostic accuracy of urodynamics is questionable, with widely variable sensitivity and specificity for the symptom diagnosis of UI [23].

3.6.3. Prognostic value

Preliminary urodynamics do not affect the outcome of conservative therapy for UI (LE: 1a). A recent Cochrane review found that patients who underwent urodynamics were more likely to be prescribed drug therapy. Urodynamic findings may change clinical decision making, but there was insufficient evidence to show whether this influenced clinical outcomes [24].

3.6.4. Success or failure of surgery for stress urinary incontinence

There is limited evidence that preliminary urodynamic testing predicts surgical outcomes in adults with UI (LE: 3). Up until July 2010 there were no randomised controlled trials (RCTs) addressing whether urodynamics influence outcome of surgery for female UI. Post hoc analysis of one trial failed to confirm a predictive value for urodynamics, although the success rate for women with urodynamic SUI exceeded that for those without [25]. There is conflicting low-level evidence that urethral function tests predict failure of surgery for SUI in women [25–27] (LE: 3). There is consistent low-level evidence that both the symptom of urgency and the urodynamic finding of detrusor overactivity are predictive of failure of SUI surgery in women [25,28,29], although the clinical usefulness remains doubtful (LE: 3).

Table 5 – Recommendations for urodynamics

	Grade
Clinicians carrying out urodynamics in patients with urinary incontinence should: • Ensure that the test replicates patient's symptoms. • Interpret results in context of the clinical problem. • Check recordings for quality control. • Remember there may be physiologic variability within the same individual.	C
Advise patients that the results of urodynamics may be useful in discussing treatment options, although there is limited evidence that performing urodynamics will alter the outcome of treatment for urinary incontinence.	C
Do not routinely carry out urodynamics when offering conservative treatment for urinary incontinence.	B
Perform urodynamics if the findings may change the choice of surgical treatment.	C
Perform urodynamics prior to surgery for urinary incontinence if there are symptoms of overactive bladder, a history of previous surgery, or evidence of voiding difficulty.	C
Do not routinely carry out urethral pressure profilometry.	C

No RCTs have investigated prediction by urodynamics of complications of surgery for SUI in women, but post hoc analysis showed that low preoperative maximum flow rate, opening pressure, and closing pressure are not consistently associated with postoperative voiding difficulty [30]. Preoperative urodynamics do not predict postoperative urgency syndrome [25]. There is no evidence to determine whether preliminary urodynamics predict treatment outcomes in male UI (LE: 4). Table 5 shows recommendations for urodynamic assessment.

3.7. Pad testing

A pad test can diagnose UI accurately, is reproducible, and correlates with symptoms [31,32] (LE: 1b). Pad tests can be used to indicate treatment outcome [33] (LE: 1b).

There is variation in the duration of the test and the physical activity undertaken during the test. A pad weight gain >1 g in a 1-h test is a threshold for the diagnosis of UI [34] (LE: 2b). Patient adherence to home pad-testing protocols is poor [35] (LE: 1b). Home-based pad tests >24 h provide no additional benefit over shorter tests [36] (LE: 2b). For recommendations, see Table 6.

3.8. Imaging

Imaging improves understanding of the anatomic and functional abnormalities that may cause UI, but its contribution to clinical care is less clear. No imaging test has been shown to predict the outcome of treatment for UI. Ultrasonography or magnetic resonance imaging (MRI) can reliably measure bladder neck and urethral mobility, although there is no evidence of clinical benefit in UI [37] (LE: 2b). Imaging of the pelvic floor can identify levator ani detachment and hiatus dimensions, although there is little evidence of clinical benefit (LE: 2b). MRI can assess pelvic organ prolapse, anorectal function, and the integrity of the pelvic floor support structures [38], but interpretation varies widely [39]. Ultrasonography can image midurethral slings, although more research is needed regarding the relationship between sling position and surgical outcome (LE: 2b). Imaging for determination of the effect of midurethral sling insertion for SUI has been assessed. The position of midurethral slings with respect to the pubis is associated with the cure of UI [40]. For recommendation, see Table 7.

Table 6 – Recommendations for pad testing

	Grade
Use a pad test when quantification of urinary incontinence is required.	C
Use repeat pad test if objective treatment outcome measure is required.	C

Table 7 – Recommendation for imaging

	Grade
Do not routinely carry out imaging of the upper or lower urinary tract as part of the assessment of uncomplicated stress urinary incontinence in women.	A

4. Conservative treatment

4.1. Simple clinical interventions

4.1.1. Treatment of comorbidity and adjustment of medication

One study suggested no correlation between early intensive treatment of type 1 diabetes mellitus and the prevalence of UI in later life versus "conventional treatment" [41]. Improved diabetic control neither resolves nor improves UI (LE: 3).

There is weak evidence that medication is associated with new, or worsening UI (LE: 3). α-Blockers used to treat hypertension in women may cause or exacerbate UI, and stopping them may relieve UI (LE: 3) [42]. However, diuretics given to elderly patients do not cause or worsen UI [43]. Central nervous system agents may cause UI as a side effect (LE: 3) [44].

Systemic oestrogen replacement in previously continent women approximately doubles the prevalence of UI at 12 mo compared with placebo (LE: 1b) [45]. Women with preexisting UI who use systemic oestrogen replacement are 30% more likely to experience worsening UI compared with placebo (LE: 1a). For recommendations, see Table 8.

Table 8 – Recommendations for simple clinical interventions

	Grade
Take a drug history from all patients with urinary incontinence.	A
Inform women with urinary incontinence that begins or worsens after starting systemic oestrogen replacement therapy that it may cause urinary incontinence.	A
Review any new medication associated with the development or worsening of urinary incontinence.	C

Table 9 – Recommendation for constipation

	Grade
For adults with urinary incontinence, treat coexisting constipation.	C

4.1.2. Constipation

There is a consistent association between a history of constipation and the development of UI and pelvic organ prolapse (LE: 3) [46,47]. Multimodal behavioural therapy improves constipation and UI in elderly patients (LE: 1b) [48]. There is no evidence that treatment of constipation improves UI, but expert opinion strongly supports treating constipation in these patients (LE: 4). For recommendation, see Table 9.

4.1.3. Containment

There were two consensus statements in the 4th International Consultation on Incontinence [49] and one RCT comparing conservative treatment with urinary pads [50]. There have been Cochrane reviews of devices [51] and pads [52]. There is an RCT comparing condom catheters with indwelling urinary catheters [53]. See Table 10 for evidence and Table 11 for recommendations on containment.

4.2. Lifestyle interventions

4.2.1. Caffeine intake

Caffeine reduction was shown to improve urinary frequency but not UI [54–56] (LE: 2).

Table 10 – Evidence on containment

	LE
Pads are not effective as a treatment for UI.	1b
Different pads have different advantages and disadvantages.	1b
Intermittent catheterisation carries a lower risk of urinary tract infection and bacteriuria than indwelling catheterisation.	1b
Containment devices are better than no treatment.	4
There is not enough evidence to conclude which containment device is best.	4
Condom catheters are better than indwelling catheters if no residual urine is present.	1b
There is no evidence to compare mechanical devices with other forms of treatment.	4

LE = level of evidence; UI = urinary incontinence.

Table 11 – Recommendations for containment

	Grade
Offer pads when containment of UI is needed.	B
Adapt the choice of pad to the type and severity of UI and the patient's needs.	A
Offer catheterisation to manage UI when no other treatments can be considered.	B
Offer condom catheters to men with UI without significant residual urine.	A
Offer to teach intermittent catheterisation to manage UI associated with retention of urine.	A
Do not routinely offer intravaginal devices as treatment for incontinence.	B
Do not use penile clamps for control of UI in men.	A

UI = urinary incontinence.

4.2.2. Physical exercise

The association between exercise and UI is unclear. Female athletes may experience UI during intense physical activity but not during common activities (LE: 3) [57–59]. However, strenuous physical activity does not predispose women to UI in later life (LE: 3) [60]. Although moderate exercise is associated with lower rates of UI in middle-age or older women, there is no evidence that starting moderate exercise improves established UI in women (LE: 2b) [61,62].

4.2.3. Fluid intake

There is conflicting evidence on whether fluid modification changes the symptoms of UI and quality of life (LE: 2). All available studies were in women [56]. A more recent RCT [63] showed that a 25% reduction in fluid intake improved symptoms in patients with overactive bladder but not UI.

4.2.4. Obesity and weight loss

Obesity is a risk factor for UI in women (LE: 1b) [64]. Two systematic reviews concluded that supervised weight loss (>5%) improves UI symptoms (LE: 1b) [65,66].

4.2.5. Smoking

There is no consistent evidence that smokers are more likely to have UI (LE: 3), but they may have a higher prevalence of severe UI (LE: 3). There is no evidence that smoking cessation improves UI symptoms (LE: 4) [66]. For recommendations, see Table 12.

4.3. Behavioural and physical therapies

There is limited evidence that supervised bladder training is better than no treatment in women with urgency UI (UUI) and mixed UI (MUI) (LE: 1b). However, the effectiveness of bladder training diminishes after treatment cessation (LE: 2). There are no adverse events.

Bladder training has been compared with other treatments for UI [66]. There is inconsistent evidence to show whether bladder training is better than drug therapy (LE: 2). The combination of bladder training with

Table 12 – Recommendations for lifestyle interventions

	Grade
Offer obese women experiencing UI weight reduction programmes.	A
Advise adults with UI that reducing caffeine intake may improve symptoms of urgency and frequency but not incontinence.	B
Patients with abnormally high or abnormally low fluid intake should be advised to modify their fluid intake appropriately.	C
Counsel female athletes experiencing UI with intense physical activity that it will not predispose to UI in later life.	C
Patients with UI who smoke should be given smoking cessation advice in line with good medical practice, although there is no definite effect on UI.	A

UI = urinary incontinence.

Table 13 – Evidence on pelvic floor muscle therapy as monotherapy

	LE
PFMT is better than no treatment for reducing incontinence episodes and improving quality of life in women with SUI and MUI. There is no evidence that PFMT is better than no treatment for cure of UI.	1
Higher intensity regimes, or the addition of biofeedback, confer greater benefit, but differences are not sustained long term.	1
A taught/supervised programme of PFMT is more effective than self-taught PFMT.	1
Group-based PFMT is as effective as treatment delivered individually.	1
Short-term benefits of intensive PFMT are not maintained at 15-yr follow-up.	2
PFMT compared with other conservative treatments	
PFMT results in greater reduction in leakage episodes than training using vaginal cones, but no difference is reported in self-reported cure or improvement.	1
PFMT results in fewer incontinence episodes than electrical stimulation.	1
PFMT does not result in measurable improvement in quality of life.	2
PFMT is better than bladder training for improvement of leakage and quality of life in women with SUI.	2
There is no consistent difference between PFMT and bladder training for women with UUI or MUI.	2
PFMT is as effective as duloxetine in women with SUI and has fewer side effects.	2
PFMT is better tolerated than oxybutynin for UUI.	2
PFMT is more effective than α-agonists for women with SUI.	2
PFMT in childbearing women	
PFMT commencing in early pregnancy reduces the risk of incontinence in late pregnancy and up to 6 mo postpartum.	1
PFMT commencing in the early postpartum period improves UI in women for up to 12 mo.	1
PFMT in men	
Men undergoing some form of PFMT, before or after radical prostatectomy, achieve continence more quickly than nontreated men.	2
There is conflicting evidence on whether the addition of electrical stimulation or biofeedback or supervised training increases the effectiveness of PFMT alone.	2
There is no evidence that preoperative PFMT prevents UI following radical prostatectomy. As with postoperative PFMT, it appears to lead to earlier recovery of continence.	2

LE = level of evidence; PFMT = pelvic floor muscle therapy; SUI = stress urinary incontinence; MUI = mixed urinary incontinence; UI = urinary incontinence; UUI = urgency urinary incontinence.

antimuscarinic drugs does not result in greater improvement of UI (LE: 2). Bladder training is better than pessary alone (LE: 1b).

Timed voiding reduces leakage episodes in cognitively impaired men and women (LE: 1b) [67].

4.3.1. *Pelvic floor muscle therapy in women*

It has been shown that pelvic floor muscle therapy (PFMT) cures or improves UI more often than no treatment [68]. One recent RCT found that PFMT in a group setting can be as effective as individual treatment [69]. One RCT with a 15-yr follow-up showed that long-term adherence to PFMT schedules was poor (see Table 13).

PFMT has been compared with several alternative therapies, alone or in combination, in a mixed treatment comparison [66]. This supported the general principle that greater efficacy was achieved by adding together different modalities of treatment and increasing intensity (see Table 13). PFMT for UI in the postpartum period was shown to increase the rate of cure after 12 mo [70].

4.3.2. *Pelvic floor muscle therapy in men with stress urinary incontinence following radical prostatectomy*

Pelvic floor muscle therapy was shown to hasten recovery of continence in men with SUI after radical prostatectomy but does not improve overall continence rates at 12 mo [57,71,72] (see Table 13).

4.3.3. *Preventive value of pelvic floor muscle therapy*

It has been shown that PFMT reduces the risk of incontinence in late pregnancy and up to 6 mo postpartum [70] and that preoperative PFMT speeds recovery of continence in men undergoing radical prostatectomy [73].

4.3.4. *Electrical stimulation (surface electrodes)*

Most evidence on electrical stimulation involves only women and is inconsistent about whether alone it can improve UI (LE: 2). Three systematic reviews were found [66,74,75] that included studies of low quality with a lack of consistency in the parameters used for electrical stimulation and outcome measures. It was not possible to compare or pool data from most of these studies.

4.3.5. *Magnetic stimulation*

There is no consistent evidence for the efficacy of magnetic stimulation for the cure or improvement of UI (LE: 2a), although there are no reports of adverse events (LE: 1b). Eight RCTs were found, but they were mostly of poor quality. The techniques of electromagnetic stimulation were poorly standardised and involved different devices, modes of delivery, and stimulation parameters [76,77]. Blinding was difficult to achieve, which resulted in a high risk of bias in some trials. There was a lack of evidence for effectiveness in men with UI.

4.3.6. *Posterior (percutaneous) tibial nerve stimulation*

Compared with sham treatment, percutaneous tibial nerve stimulation (PTNS) was shown to improve but not cure UUI in some women who have not benefited from antimuscarinic medication (LE: 1b) [78,79]. PTNS is no more effective than tolterodine for the improvement of UUI in women (LE: 2b) [79]. No serious adverse events have been

Table 14 – Recommendations for behavioural and physical therapies

	Grade
Offer supervised PFMT, lasting at least 3 mo, as a first-line therapy to women with SUI or MUI.	A
PFMT programmes should be as intensive as possible.	A
Consider using biofeedback as an adjunct to PFMT in women with SUI.	A
Offer supervised PFMT to continent women in their first pregnancy to help prevent incontinence in the postnatal period.	A
Offer instruction on PFMT to men undergoing radical prostatectomy to speed recovery from UI.	B
Offer bladder training as a first-line therapy to adults with UUI or MUI.	A
Offer timed voiding to adults with UI and cognitive impairment.	A
Do not offer electrical stimulation with surface electrodes (skin, vaginal, anal) alone for the treatment of UI.	A
Do not offer magnetic stimulation for the treatment of UI or overactive bladder in adult women.	B
Do not offer PTNS to women or men who are seeking a cure for UUI.	A
Offer, if available, PTNS as an option for improvement of UUI in women who have not benefited from antimuscarinic medication.	B

MUI = mixed urinary incontinence; PFMT = pelvic floor muscle training; PTNS = posterior tibial nerve stimulation; UI = urinary incontinence; UUI = urgency urinary incontinence.

Table 15 – Recommendations for antimuscarinic drugs

	Grade
Offer IR or ER formulations of antimuscarinic drugs as an initial treatment option for adults with UUI.	A
If IR formulations of antimuscarinic drugs are unsuccessful for adults with UUI, offer ER or long-acting drugs.	A
Consider using transdermal oxybutynin if oral antimuscarinic agents cannot be tolerated due to dry mouth.	B
Offer and encourage review of benefit within 1 mo to patients started on antimuscarinic drugs for UUI.	A
Inform elderly patients and their caregivers of the risk of new or worsened cognitive impairment and assess cognitive function in those deemed to be of higher risk.	C
Avoid using oxybutynin IR in patients who are at risk of cognitive impairment.	A
Use antimuscarinic drugs with caution in patients with cognitive impairment.	B

IR = immediate release; ER = extended release; UUI = urgency urinary incontinence.

reported (LE: 3). There are insufficient data to determine the effectiveness of PTNS in men (LE: 4). For recommendations, see Table 14.

5. Drug treatment

5.1. Antimuscarinic drugs

Antimuscarinic drugs are an early treatment option for adults with UUI, as indicated in the care pathway (Figs. 1 and 2). Immediate-release (IR), extended-release (ER), long-acting, and transdermal formulations are available. More than 50% of patients stop antimuscarinic drugs within the first 3 mo because of lack of benefit, adverse effects, and cost (LE: 2). For recommendations, see Table 15.

5.2. Comparisons with placebo

All antimuscarinic drugs available as IR or transdermal preparations improved UUI (LE: 1a) [80–83]. All available drugs except trospium IR demonstrated higher rates of cure of UUI compared with placebo (LE: 1a). Oxybutynin topical gel was effective for cure and improvement of UUI [84]. Compared with placebo, frequency of dry mouth was higher with all IR drugs and similar with transdermal oxybutynin (LE: 1a).

Extended-release formulations of antimuscarinic drugs are effective for improvement and cure of UUI (LE: 1b) [82,85–90], but all show higher rates of dry mouth compared with placebo (LE: 1b).

5.3. One drug against another

There is no consistent evidence that one antimuscarinic drug is superior to another for cure or improvement of UUI or improvement in quality of life (LE: 1a). There is weak evidence that oxybutynin ER is more effective than tolterodine ER for the cure of UI (LE: 1b) [81,91]. There is some evidence that fesoterodine is superior to tolterodine ER for cure and improvement of UI (LE: 1b) [85,86,92].

ER and long-acting antimuscarinic drugs are generally associated with lower rates of dry mouth than IR preparations, although discontinuation rates are similar (LE: 1b). Transdermal oxybutynin is associated with lower rates of dry mouth than oral drugs, but it has a high rate of withdrawal due to skin reaction (LE: 1b).

5.4. Drug versus nondrug treatment

Evidence comparing nondrug and drug treatment was summarised in four high-quality systematic reviews [75,82,91,93] of trials of low or moderate quality. There is no consistent evidence to show superiority of drug therapy over behavioural therapy (LE: 1b). However, the addition of antimuscarinic drugs to primary behavioural therapy may be beneficial (LE: 2). Antimuscarinic drug treatment has a higher rate of adverse effects than behavioural therapy (LE: 1a).

5.5. Drugs in elderly people and those with cognitive impairment

Elderly people have been underrepresented in RCTs of antimuscarinic agents, despite having a higher prevalence

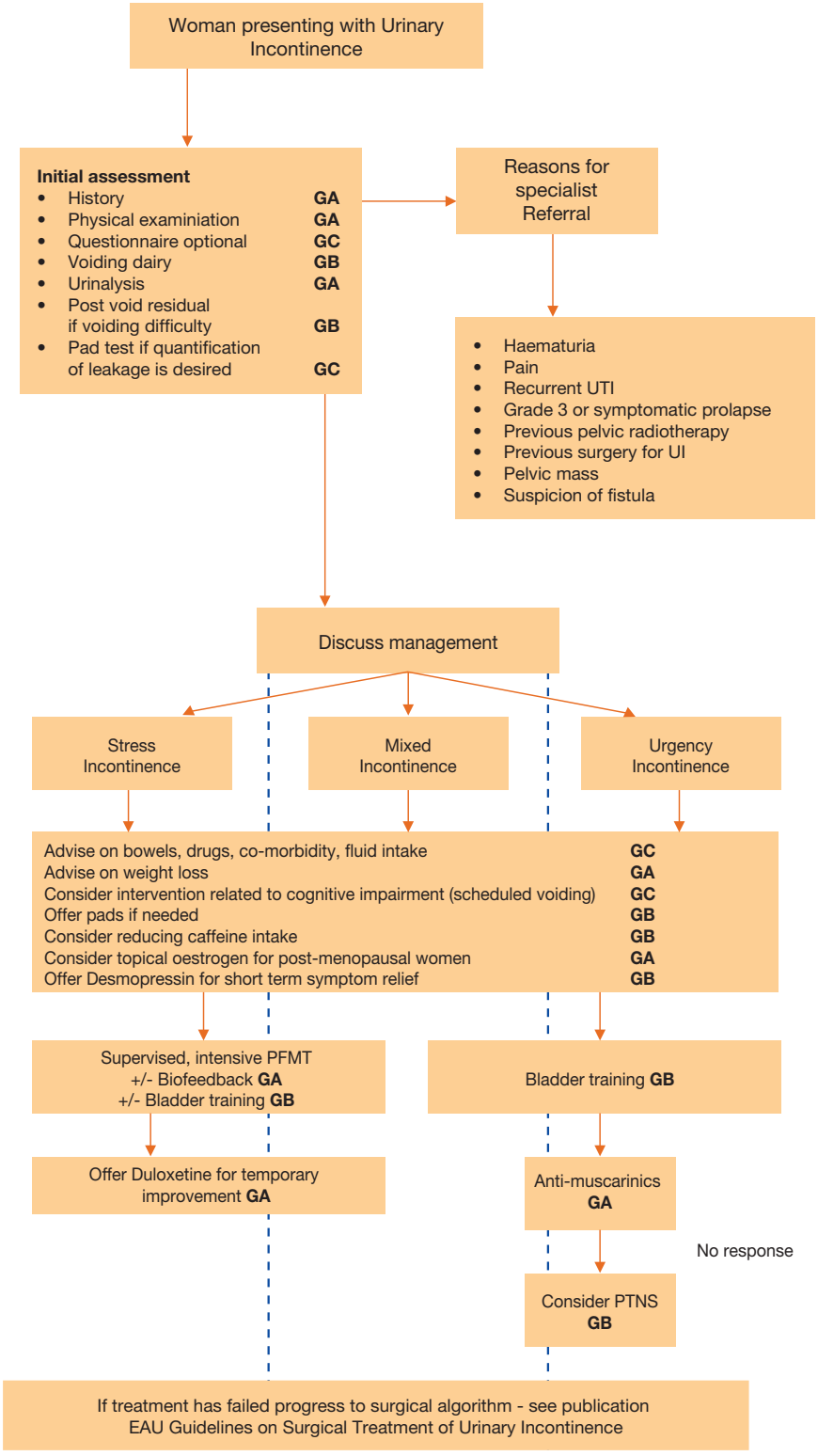

Fig. 1 – Clinical algorithm for the assessment and nonsurgical treatment of incontinence in women. GA = grade A; GB = grade B; GC = grade C; PFMT = pelvic floor muscle therapy; PTNS = percutaneous tibial nerve stimulation; UI = urinary incontinence; UTI = urinary tract infection.

of UUI. In three systematic reviews of antimuscarinic agents in elderly patients [91,94,95], there was conflicting evidence of the effect of oxybutynin on cognitive function; oxybutynin IR may worsen cognitive function (LE: 2), but oxybutynin ER does not worsen cognitive impairment in elderly women (LE: 1b). The effectiveness and risk of adverse events (including cognitive dysfunction) of solifenacin, tolterodine, and darifenacin do not differ with patient age (LE: 1b). When using antimuscarinic drugs in patients at risk of worsening cognitive function, it may be

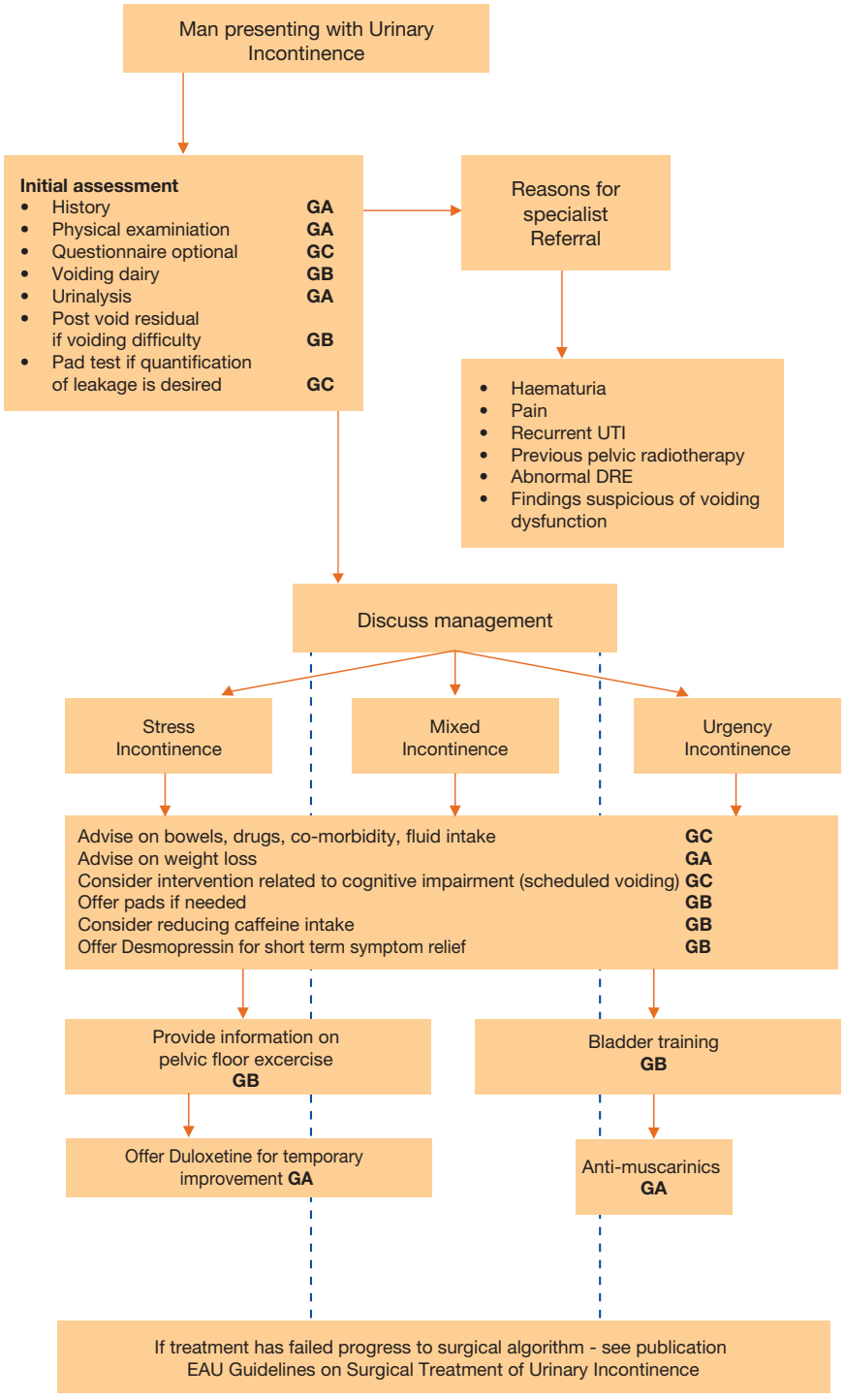

Fig. 2 – Clinical algorithm for the assessment and nonsurgical treatment of incontinence in men. DRE = digital rectal examination; GA = grade A; GB = grade B; GC = grade C; UTI = urinary tract infection.

appropriate to monitor changes during initiation and continuation of treatment.

5.6. Duloxetine

Duloxetine has been investigated for relief of SUI in adults. It may be offered to both women and men with SUI for temporary improvement or when more effective options such as surgery cannot be used (Figs. 1 and 2).

There is evidence that duloxetine is beneficial at a typical dose of 80 mg daily in women [75,96] and men [43] with SUI or MUI. Duloxetine does not cure but does improve UI in women (LE: 1b) with no clear difference in efficacy between SUI and MUI. There is no evidence that duloxetine improves

Table 16 – Recommendations for duloxetine

	Grade
Duloxetine should not be offered to women or men who are seeking a cure for their incontinence.	A
Duloxetine can be offered to women who are seeking temporary improvement in incontinence symptoms.	A
Duloxetine can be offered as an adjunct to pelvic floor muscle therapy for men with postprostatectomy stress urinary incontinence.	B
Duloxetine should be initiated using dose titration because of high adverse effect rates.	A

Table 17 – Recommendation for oestrogen

	Grade
Offer postmenopausal women with urinary incontinence local oestrogen therapy, although the ideal duration of therapy and best delivery method are uncertain.	A

quality of life. There is no evidence that duloxetine is better than PFMT in women. There is weak evidence that duloxetine may be a beneficial adjunct to PFMT in men with postprostatectomy incontinence (LE: 2). All studies showed high withdrawal rates for duloxetine, principally due to lack of benefit and nausea (LE: 1b). For recommendations, see Table 16.

5.7. *Intravaginal oestrogen*

Intravaginal oestrogen improves vaginal and urinary symptoms in postmenopausal women irrespective of the presence of visible mucosal atrophy. It is a useful early option for women with all types of UI (Fig. 1). There is consistent evidence that intravaginal oestrogen can cure and improve UI in postmenopausal women [45] (LE: 1a). For recommendations, see Table 17.

5.8. *Desmopressin*

Desmopressin has been used effectively for the treatment of enuresis, principally in children and young adults. It is an option for women who require short-lived situational relief from episodes of UI (Fig. 1).

The risk of UI in women is reduced within 4 h of taking desmopressin but not after 4 h (LE: 1b) [97]. Continuous desmopressin does not improve or cure UI (LE: 1) [98]. For recommendations, see Table 18.

Table 18 – Recommendations for desmopressin

	Grade
Offer desmopressin to patients requiring occasional situational short-term relief from urinary incontinence; inform them that this drug is not licensed for this indication.	B
Do not use desmopressin for long-term control of urinary incontinence.	A

6. Conclusions

Urinary incontinence is a common symptom that people present to urology clinicians. We have presented a summary of the current evidence that will help clinicians assess, diagnose, and select the most appropriate conservative treatment for patients who come under their care (Figs. 1 and 2). We have used the LEs found by our review of the literature together with the expert opinion of a panel of urologists to weight appropriately the strength of practice recommendations contained in the guideline. We hope this pragmatic approach will be useful for clinicians and patients in finding the best way for each individual to improve his or her UI and alleviate the distress that it causes.

The present text represents a summary of the work. For more detailed information and a full list of references, access the full-text version freely available on the EAU Web site at www.uroweb.org (ISBN 978-90-79754-83-0). We believe our methodology provides a robust and sustainable way to produce authoritative, generalisable guidance that can be readily revised. In line with the policy of the EAU guidelines board, the guidelines on UI will be updated annually including the latest published evidence.

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Study concept and design: Lucas.
Acquisition of data: Lucas, Bosch, Cruz, Pickard, de Ridder, Tubaro, Neisius, Turner, Madden, Nambiar.
Analysis and interpretation of data: Lucas, Bosch, Cruz, Pickard, de Ridder, Tubaro, Neisius, Turner, Madden, Nambiar.
Drafting of the manuscript: Lucas, Bosch, Cruz, Pickard, de Ridder, Tubaro, Neisius, Turner.
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