EAU GUIDELINES ON NON-NEUROGENIC FEMALE LUTS

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Introduction

The latest edition of the guidelines has seen a significant expansion of scope from 'urinary incontinence (UI)' to 'non-neurogenic female lower urinary tract symptoms (LUTS)'. The primary consideration here was to include the significant population of women with functional urological conditions not necessarily associated with UI that were hitherto not accounted for in previous guidelines. This reconfiguration has also seen some additional sections added to this guideline (including non-obstetric fistulae, female bladder outlet obstruction [BOO], underactive bladder [UAB] and nocturia) and over the course of the next two or three iterations the scope is likely to widen further.

DIAGNOSIS - GENERAL

History and physical examination

Taking a thorough clinical history is fundamental to the process of clinical evaluation. Despite the lack of high-level evidence to support it, there is universal agreement that taking a history should be the first step in the assessment of anyone with LUTS.

The history should include a full evaluation of LUT symptoms (storage, voiding and post-micturition symptoms), sexual, gastrointestinal and neurological symptoms. Details of urgency episodes, the type, timing and severity of UI, and some attempt to quantify symptoms should also be made. The history should help to categorise LUTS as storage, voiding and post-void symptoms, and classify UI as stress urinary incontinence (SUI), urgency UI (UUI), mixed UI (MUI) or overflow incontinence, the latter being defined as *'the complaint of UI in the symptomatic presence of an excessively (over-) full bladder (no cause identified)'*.

Recommendation	Strength rating
Take a complete medical history including symptoms and comorbidities and a focused physical examination in the evaluation of women with LUTS.	Strong

Patient questionnaires

Summary of evidence	LE
Validated condition-specific symptom scores assist in the screening for, and categorisation of LUTS.	3
Patient questionnaires cannot replace a detailed patient consultation and should only be used as part of a complete medical history.	4

Recommendation	Strength rating
Use a validated and appropriate questionnaire as part of the standardised initial assessment and follow-up of female LUTS.	Strong

Bladder diaries

Recommendations	Strength rating
Ask patients with LUTS to complete a bladder diary as part of the standardised assessment of female LUTS.	Strong
Use a bladder diary with a duration of ≥ 3 days.	Strong

Urinalysis

Recommendations	Strength rating
Perform urinalysis as a part of the initial assessment of a patient LUTS.	Strong
If a urinary tract infection is present with LUTS, reassess the patient after treatment.	Strong
Do not routinely treat asymptomatic bacteriuria in elderly patients to improve urinary incontinence.	Strong

Post-void residual volume

Recommendations	Strength rating
Measure post-void residual volume (PVR) in patients with LUTS during initial assessment.	Strong
Use ultrasound to measure PVR.	Strong
Monitor PVR in patients receiving treatments that may cause or worsen voiding dysfunction.	Strong
Provide bladder voiding efficiency as an additional parameter when measuring PVR volume.	Weak

Urodynamics

Summary of evidence	LE
Most urodynamic parameters show variability within the same session and over time, and this may limit their clinical interpretation.	3
There may be inconsistency between history and urodynamic results.	3
Urodynamic diagnosis of detrusor overactivity (DO) does not influence treatment outcomes in patients with overactive bladder (OAB).	1a
Pre-operative urodynamics in women with uncomplicated, clinically demonstrable stress urinary incontinence (SUI) does not improve the outcome of surgery for SUI.	1b
There is no consistent correlation between the result of urethral function tests and subsequent success or failure of SUI surgery.	3
There is no consistent evidence that pre-operative DO is associated with surgical failure of mid-urethral sling in women.	3
The presence of pre-operative DO may be associated with persistence of urgency urgency postoperatively in women undergoing surgery for SUI.	3

Recommendations	Strength rating
Adhere to good urodynamic practice standards as described by the International Continence Society when performing urodynamics in patients with LUTS.	Strong
Do not routinely carry out urodynamics when offering treatment for uncomplicated stress urinary incontinence.	Strong

Do not routinely carry out urodynamics when offering first-line treatment to patients with uncomplicated overactive bladder symptoms.	Strong
Perform urodynamics if the findings may change the choice of invasive treatment.	Weak
Do not use urethral pressure profilometry or leak point pressure to grade severity of urinary incontinence as they are primarily tests of urethral function.	Strong

Pad testing

Recommendations	Strength rating
When pad test is performed, use a standardised duration and activity protocol.	Strong
Use a pad test when quantification of urinary incontinence is required, especially to assess response to treatment.	Weak

Imaging

Recommendation	Strength rating
Do not routinely carry out imaging of the upper or lower urinary tract as part of the assessment of LUTS.	Strong

Urinary biomarkers

Recommendation	Strength rating
Do not routinely use urinary biomarkers or estimation of the urinary microbiome in the diagnosis and management of LUT disease in women.	Strong

DISEASE MANAGEMENT

Overactive bladder

Overactive bladder is defined by the International Continence Society (ICS) as *'urinary urgency, usually accompanied by frequency and nocturia, with or without UUI, in the absence of urinary tract infection (UTI) or other obvious pathology'*.

Diagnostic evaluation

Recommendations	Strength rating
Request that patients complete at least a 3-day bladder diary at initial evaluation for overactive bladder (OAB).	Strong
Do not routinely carry out urodynamics when offering first-line treatment to patients with uncomplicated OAB symptoms.	Strong

Conservative management

Addressing underlying disease/cognitive impairment

Lower urinary tract symptoms, especially in the elderly, have been associated with multiple comorbid conditions including:

- cardiac failure;
- chronic renal failure;
- diabetes;
- chronic obstructive pulmonary disease;
- neurological disease;
- general cognitive impairment;
- sleep disturbances, e.g. sleep apnoea;
- depression;
- metabolic syndrome.

Management of associated conditions

Recommendation	Strength rating
Review any new medication associated with the development or worsening of urinary incontinence.	Weak

Adjustment of non-LUTS medication

Recommendations	Strength rating
Take a history of current medication use from all patients with overactive bladder (OAB).	Strong
Review any new medication associated with the development or worsening of OAB symptoms.	Weak

Urinary containment

Recommendations	Strength rating
Ensure that women with overactive bladder (OAB) and/or their carers are informed regarding available treatment options before deciding on urinary containment alone.	Strong
Offer incontinence pads and/or containment devices for management of wet OAB, either for temporary symptom control or when other treatments are not planned.	Strong
Offer prophylactic antibiotics to patients with recurrent UTI who perform clean intermittent self-catheterisation (CISC), after discussion regarding the risk of increasing antimicrobial resistance.	Strong

Lifestyle interventions

Summary of evidence	LE
Obesity is a risk factor for urinary incontinence in women, but the relationship to other overactive bladder (OAB) symptoms remains unclear.	1b
There is weak evidence that smoking cessation will improve the symptoms of OAB.	3

Recommendations	Strength rating
Encourage overweight and obese adults with overactive bladder (OAB)/urinary incontinence (UI) to lose weight and maintain weight loss.	Strong
Advise adults with OAB that reducing caffeine intake may improve symptoms of urgency and frequency, but not incontinence.	Strong
Review type and amount of fluid intake in patients with OAB.	Weak
Provide smoking cessation strategies to patients with OAB who smoke.	Strong

Behavioural and physical therapies

Summary of evidence	LE
Pelvic floor muscle training (PFMT) may improve symptoms of frequency and incontinence in women.	1b
Electrical stimulation (ES) may improve symptoms of overactive bladder in some women, but the type and mode of delivery of ES remains variable and poorly standardised.	1a

Recommendations	Strength rating
Offer prompted voiding to adults with overactive bladder (OAB) who are cognitively impaired.	Strong
Offer bladder training as a first-line therapy to adults with OAB/urgency urinary incontinence (UUI).	Strong
Ensure that pelvic floor muscle training programs are as intensive as possible.	Strong
Consider posterior tibial nerve stimulation as an option for improvement of OAB/UUI in women who have not benefited from anticholinergic medication.	Strong

Pharmacological management

Anticholinergic drugs

Summary of evidence	LE
No anticholinergic drug is clearly superior to another for cure or improvement of overactive bladder (OAB)/ urgency urinary incontinence (UUI).	1a
Higher doses of anticholinergic drugs are more effective to improve OAB symptoms, but exhibit a higher risk of side effects.	1a
Adherence to anticholinergic treatment is low and decreases over time because of lack of efficacy, adverse events and/or cost.	2a
Most patients will stop anticholinergic agents within the first three months.	2a

Recommendations	Strength rating
Offer anticholineric drugs to women with overactive bladder (OAB) who fail conservative treatment.	Strong
Consider extended release formulations of anticholinergic drugs, whenever possible.	Strong
If an anticholinergic treatment proves ineffective, consider dose escalation, offering an alternative anticholinergic formulation, or the use of mirabegron (alone or in combination with an anticholinergic).	Strong
Encourage early review (of efficacy and side effects) of patients on anticholinergic medication for OAB.	Strong

Beta-3 agonists

Summary of evidence	LE
Mirabegron and Vibegron are better than placebo and as efficacious as anticholinergics for improvement of overactive bladder/urgency urinary incontinence symptoms.	1a
Adverse event rates with Mirabegron and Vibegron are similar to those of placebo.	1a
Patients inadequately treated with solifenacin 5 mg may benefit more from the addition of mirabegron rather than dose escalation of solifenacin.	1b

Recommendation	Strength rating
Offer beta-3 agonists as an alternative to anticholinergics to women with overactive bladder who fail conservative treatment.	Strong

Anticholinergics and beta-3 agonists: the elderly and cognition

Recommendations	Strength rating
Long-term anticholinergic treatment should be used with caution in elderly women, especially those who are at risk of, or have pre-existing cognitive dysfunction.	Strong
Assess anticholinergic burden and associated comorbidities in patients being considered for anticholinergic therapy for overactive bladder syndrome.	Weak

Oestrogens

Recommendation	Strength rating
Offer vaginal oestrogen therapy to women with LUTS and associated symptoms of genito-urinary syndrome of menopause.	Weak

Surgical management

Bladder wall injection of botulinum toxin A

Summary of evidence	LE
A single treatment session of onabotulinum toxin A (100 U) injected in the bladder wall is more effective than placebo at curing and improving overactive bladder (OAB)/urgency urinary incontinence (UUI) symptoms and improving quality of life.	1a

There is no evidence that repeated injections of onabotulinum toxin A have reduced efficacy but discontinuation rates are high.	2a
There is a risk of increased PVR and urinary tract infection with onabotulinum toxin A injections.	2
Onabotulinum toxin A (100 U) is superior to anticholinergics and mirabegron for cure of UUI and improvement of symptoms of OAB at twelve weeks.	1a

Recommendations	Strength rating
Offer bladder wall injections of onabotulinum toxin A (100 U) to patients with overactive bladder (OAB)/urgency urinary incontinence (UUI) refractory to conservative therapy or drug treatment.	Strong
Warn patients of the limited duration of response, risk of urinary tract infection and possible prolonged need for clean intermittent self-catheterisation prior to treatment with onabotulinum toxin A.	Strong

Sacral nerve stimulation

Summary of evidence	LE
Sacral nerve stimulation (SNS) is more effective than continuation of failed conservative treatment for overactive bladder (OAB)/urgency urinary incontinence (UUI), but no sham controls have been used.	1b
Sacral nerve stimulation is similarly effective as onabotulinum A toxin 200 U injection at 24 months.	1b
In patients who have been implanted, 50% improvement of UUI is maintained in ≥ 50% of patients and 15% may remain cured at 4 years.	3

Recommendation	Strength rating
Offer sacral nerve stimulation to patients who have overactive bladder/urgency urinary incontinence refractory to anticholinergic therapy.	Strong

Laser treatment

Summary of evidence	LE
Vaginal laser therapy shows minimal overactive bladder symptom improvement in the short term, with minimal complications. However, long-term efficacy and safety data is lacking.	3

Recommendation	Strength rating
Do not offer vaginal laser therapy to treat overactive bladder symptoms outside of a well regulated clinical research trial.	Strong

Cystoplasty/urinary diversion

Recommendations	Strength rating
Ensure patient counselling and lifelong support both prior to and after major surgery as a treatment for overactive bladder (OAB).	Strong
Offer augmentation cystoplasty to patients with OAB/urgency urinary incontinence (UUI) who have failed all other treatment options and have been warned about the possible small risk of malignancy.	Weak

Inform patients undergoing augmentation cystoplasty of the high risk of clean intermittent self-catheterisation (ensure they are willing and able to do so) and that they need life-long surveillance.	Strong
Do not offer detrusor myectomy as a treatment for UUI.	Weak
Only offer urinary diversion to patients who have failed less-invasive therapies for the treatment of OAB/UUI, who will accept a stoma and have been warned about the possible small risk of malignancy.	Weak

Follow-up

Follow-up for women with OAB is guided by the type of treatment instituted and local service capacity. Standardisation of follow-up pathways can therefore be difficult. The Panel provide recommendations based on best practice and standards from clinical trials.

Recommendations	Strength rating
Offer early follow-up to women who have been commenced on anti-anticholinergic or beta-3 agonist therapy.	Strong
Offer repeat injections of onabotulinum toxin A, as required, to women in whom it has been effective (refer to the manufacturers' guidance regarding the minimum timeframe for repeat injections).	Strong
Offer life-long surveillance to women who have a sacral nerve stimulation implant to monitor for lead displacement, malfunction and battery wear.	Strong

Offer cystoscopic surveillance to women with an augmentation cystoplasty due to the small risk of malignancy.	Weak

Stress Urinary Incontinence

Classification

Patients with SUI can be classified as *'uncomplicated'* and *'complicated'*. The Panel reached consensus on the definition to be used throughout this Guideline document:

- Women with uncomplicated SUI: no history of prior surgery for SUI, no prior extensive pelvic surgery, no prior pelvic radiation treatment, no neurogenic LUT dysfunction, no bothersome genitourinary prolapse, absence of voiding symptoms, and no medical conditions that affect the LUT. In cases where additional significant storage symptoms, especially OAB, are present, consider a possible diagnosis of MUI.
- Women with complicated SUI: women with previous surgery for incontinence or previous extensive pelvic surgery, women with a history of pelvic irradiation, the presence of anterior or apical pelvic-organ prolapse, the presence of voiding symptoms or the presence of neurogenic LUT dysfunction, and women with significant OAB/UUI.

Diagnostic evaluation

History taking and physical examination

Recommendation	Strength rating
Take a full clinical history and perform a thorough physical examination in all women presenting with stress urinary incontinence.	Strong

Patient questionnaires

Recommendation	Strength rating
Use a validated and appropriate questionnaire as part of the standardised assessment of patients with stress urinary incontinence.	Strong

Post-void residual volume

Recommendations	Strength rating
Measure post void residual (PVR) volume, particularly when assessing patients with voiding symptoms or complicated stress urinary incontinence (SUI).	Strong
When measuring PVR, use ultrasound in preference to catheterisation.	Strong
Monitor PVR in patients scheduled for treatment which may cause or worsen voiding dysfunction, including surgery for SUI.	Strong

Urodynamics

Summary of evidence	LE
Pre-operative urodynamics in women with uncomplicated, clinically demonstrable, stress urinary incontinence (SUI) does not improve the outcome of surgery for SUI.	1b
There is no consistent evidence that pre-operative detrusor overactivity is associated with surgical failure of mid-urethral sling in women.	3

Recommendations	Strength rating
Do not routinely carry out urodynamic tests when offering treatment for uncomplicated stress urinary incontinence (SUI).	Strong
Perform preoperative urodynamic tests in cases of SUI with associated storage symptoms; cases in which the type of incontinence is unclear; cases in which voiding dysfunction is suspected; and cases with associated pelvic organ prolapse or prior surgery for SUI.	Weak
Perform urodynamic tests if the findings may change the choice of invasive treatment.	Weak
Do not use urethral pressure profilometry or leak point pressure to grade severity of incontinence as they are primarily tests of urethral function.	Strong

Pad testing

Recommendations	Strength rating
Use a pad test of standardised duration and activity protocol.	Strong
Use a standardised pad test when quantification of UI is required, especially to assess response to treatment.	Weak

Imaging

Recommendation	Strength rating
Do not carry out imaging of the upper or lower urinary tract as part of the routine assessment of stress urinary incontinence.	Strong

Disease management

Conservative management

Obesity and weight loss

Recommendation	Strength rating
Encourage overweight and obese women with LUTS/stress urinary incontinence to lose weight and maintain weight loss.	Strong

Urinary containment

Recommendations	Strength rating
Ensure that women with stress urinary incontinence (SUI) and/or their carers are informed regarding available treatment options before deciding on urinary containment alone.	Strong
Offer incontinence pads and/or containment devices for management of SUI, either for temporary symptom control or where other treatments are not planned.	Strong

Pelvic floor muscle training

Recommendations	Strength rating
Offer supervised intensive pelvic floor muscle training (PFMT), lasting at least three months, as first-line therapy to all women with stress urinary incontinence (SUI) or mixed urinary incontinence (including the elderly and pre- and post-natal women).	Strong
Ensure that PFMT programmes are as intensive as possible.	Strong

Balance the efficacy and lack of adverse events from PFMT against the expected effect and complications from invasive surgery for SUI.	Strong
Do not offer electrical stimulation with surface electrodes (skin, vaginal, anal) alone for the treatment of SUI.	Strong

Pharmacological management

Oestrogens

Recommendation	Strength rating
Offer vaginal oestrogen therapy to postmenopausal women with stress urinary incontinence (SUI) and symptoms of vulvo-vaginal atrophy.	Strong
In women taking oral conjugated equine oestrogen as hormone replacement therapy who develop or experience worsening SUI, discuss alternative hormone replacement therapies.	Strong

Duloxetine

Summary of evidence	LE
Duloxetine improves stress urinary incontinence in women, but the chances of cure are low.	1a
Duloxetine may cause significant gastrointestinal and central nervous system adverse effects, leading to a high rate of treatment discontinuation, although these symptoms may be limited to the first weeks of treatment.	1a

Recommendations	Strength rating
Offer duloxetine (where licensed) to selected patients with stress urinary incontinence unresponsive to other conservative treatments and who want to avoid invasive treatment, counselling carefully about the risk of adverse events.	Strong
Duloxetine should be initiated and withdrawn using dose titration because of the high risk of adverse events.	Strong

Surgical management

General considerations

The use of polypropylene mesh as synthetic mid-urethral sling (MUS) for the treatment of SUI has recently come under scrutiny following concerns raised regarding long-term complications. In some European countries such as the United Kingdom the use of synthetic MUS has been paused.

A 2020 UK parliamentary review concluded that *"For many women mesh surgery is trouble-free and leads to improvements in their condition. However, this is not the case for all. There is no reliable information on the true number of women who have suffered complications. While they may be in the minority, that does not diminish the catastrophic nature of their suffering or the importance of providing support to them and learning from what has happened to them"*.

Surgical management of uncomplicated SUI

Recommendations	Strength rating
Offer patients who have explored/failed conservative treatment options a choice of different surgical procedures, where appropriate, and discuss the advantages and disadvantages of each approach.	Strong
Use new devices for the treatment of stress urinary incontinence only as part of a structured research programme. Their outcomes must be monitored in a registry or as part of a well regulated research trial.	Strong

Open and laparoscopic colposuspension surgery

Recommendation	Strength rating
Offer colposuspension (open or laparoscopic) to women seeking surgical treatment for stress urinary incontinence following a thorough discussion of the risks and benefits relative to other surgical modalities.	Strong

Autologous sling

Summary of evidence	LE
Autologous sling is more effective in terms of cure rate than colposuspension.	1a
Autologous sling has a similar rate of adverse events compared to open colposuspension, with higher rates of voiding dysfunction and postoperative urinary tract infection, but a lower rates of pelvic organ prolaps and bladder- or urethral perforation.	1a

Recommendation	Strength rating
Offer autologous sling placement to women seeking surgical treatment for stress urinary incontinence following a thorough discussion of the risks and benefits relative to other surgical modalities.	Strong

Urethral bulking agents

Summary of evidence	LE
Urethral bulking agents may provide short-term improvement and cure, in women with stress urinary incontinence (SUI).	1b
Bulking agents are less effective than mid-urethral sling, colposuspension or autologous sling for cure of SUI and repeat injections may be required in order to achieve sustained benefits.	1b
There is no evidence that one type of bulking agent is better than another type.	1b

Recommendations	Strength rating
Offer urethral bulking agents to women seeking surgical treatment for stress urinary incontinence (SUI) following a thorough discussion of the risks and benefits relative to other surgical modalities.	Strong
Offer urethral bulking agents to women with SUI who request a low-risk procedure with the understanding that efficacy is lower than other surgical procedures, repeat injections are likely and long-term durability and safety are not established.	Strong

Do not offer autologous fat and hyaluronic acid as urethral bulking agents due to the higher risk of adverse events.	Strong

Laser treatment

Recommendation	Strength rating
Do not offer vaginal laser therapy to treat stress urinary incontinence symptoms outside of a well regulated clinical research trial.	Strong

Mid-urethral slings

Summary of evidence	LE
The retropubic mid-urethral sling (MUS) appears to provide better patient-reported subjective and objective cure of stress urinary incontinence, compared with colposuspension.	1a
Synthetic MUS inserted by the retropubic route have higher patient-reported cure rates in the longer term.	1b
Long-term analyses of MUS cohorts showed a sustained response beyond ten years.	2b
The retropubic route of insertion, compared with the transobturator route, is associated with a higher intraoperative risk of bladder perforation and a higher rate of voiding dysfunction.	1a
The transobturator route of insertion is associated with a higher risk of groin pain than the retropubic route.	1a
The comparative efficacy of single-incision slings against conventional MUS is uncertain.	1a

Recommendations	Strength rating
Offer a mid-urethral sling (MUS) to women seeking surgical treatment for stress urinary incontinence following a thorough discussion of the risks and benefits relative to other surgical modalities.	Strong
Inform women that long-term outcomes from MUS inserted by the retropubic route are superior to those inserted via the transobturator route.	Strong
Inform women of the complications associated with MUS procedures and discuss all alternative treatments in the light of recent publicity surrounding surgical mesh.	Strong
Inform women who are being offered a single-incision sling that long-term efficacy remains uncertain.	Strong

Other treatments of uncomplicated SUI

Recommendations	Strength rating
Offer Vesair® intravesical balloon to women with mild-to-moderate stress urinary incontinence (SUI) who failed conservative treatments only as part of a well-conducted research trial.	Weak
Offer mechanical devices to women with mild-to-moderate SUI who failed conservative treatments only as part of a well-conducted research trial.	Strong

Inform women receiving artificial urinary sphincter or adjustable compression device (ACT©) that although cure is possible, even in expert centres, there is a high risk of complications, mechanical failure or a need for explantation.	Strong

Management of complicated SUI

Recommendations	**Strength rating**
Management of complicated stress urinary incontinence (SUI) should only be offered in centres with appropriate experience.	Strong
Base the choice of surgery for recurrent SUI on careful evaluation, including individual patient factors and considering further investigations such as cystoscopy, multichannel urodynamics, as appropriate.	Strong
Inform women with recurrent SUI that the outcome of a surgical procedure, when used as a second-line treatment, is generally inferior to its use as a first-line treatment, both in terms of reduced efficacy and increased risk of complications.	Weak
Only offer adjustable mid-urethral sling as a primary surgical treatment for SUI as part of a structured research programme.	Strong
Consider secondary synthetic sling, bulking agents, colposuspension, autologous sling or artificial urinary sphincter (AUS) as options for women with complicated SUI.	Weak

Inform women receiving AUS or ACT® device that, although cure is possible, even in expert centres, there is a high risk of complications, mechanical failure or a need for explantation.	Strong

Surgery of SUI in special patient groups

Recommendations	Strength rating
Inform obese women with stress urinary incontinence (SUI) about the increased risks associated with surgery, together with the lower probability of benefit.	Weak
Inform older women with SUI about the increased risks associated with surgery, together with the likelihood of lower probability of benefit.	Weak

Follow-up

The follow-up of patients with SUI will be dependent on the treatment given. For conservative and physical therapies sufficient time should be allowed for the demonstration of treatment effect. For pharmacological treatment early follow-up is recommended. For most surgical interventions short term follow-up should be arranged to assess efficacy and identify any surgical complications in the early postoperative phase.

Mixed Urinary Incontinence

The term 'mixed urinary incontinence (MUI)' is extremely broad because it may refer to equal stress and urgency symptoms, stress-predominant symptoms, urgency-predominant symptoms, urodynamic SUI (USUI or USI) with detrusor overactivity (DO), or USUI with clinical urgency symptoms, but no DO.

Diagnostic evaluation

Summary of evidence	LE
There is no evidence that urodynamics affects outcomes of treatment for MUI.	3

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

Disease Management

Conservative management in MUI

Summary of evidence	LE
Pelvic floor muscle training (PFMT) appears less effective for MUI than for SUI alone.	2

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 of MUI

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 treatments and who want to avoid invasive treatment, counselling carefully about the risk of adverse events.	Weak

Surgical management of MUI

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.	Strong

Underactive Bladder

Underactive bladder is defined by the ICS as '*a symptom complex characterised by a slow urinary stream, hesitancy, and straining to void, with or without a feeling of incomplete bladder emptying sometimes with storage symptoms*'.

Management of underactive bladder

Recommendations	Strength rating
Encourage double voiding in those women who are unable to completely empty their bladder.	Weak
Warn women with underactive bladder (UAB) who use abdominal straining to improve emptying about Pelvic Organ Prolapse (POP) risk.	Weak
Use clean intermittent self-catheterisation (CISC) as a standard treatment in patients who are unable to empty their bladder.	Strong
Thoroughly instruct patients in the technique and risks of CISC.	Strong
Offer indwelling transurethral catheterisation and suprapubic cystostomy only when other modalities for urinary drainage have failed or are unsuitable.	Weak
Do not routinely recommend intravesical electrical stimulation in women with UAB.	Weak
Do not routinely recommend parasympathomimetics in the treatment of women with UAB.	Strong
Offer alpha-blockers before more invasive techniques.	Weak

Offer intravesical prostaglandins to women with urinary retention after surgery only in the context of well-regulated clinical trials.	Weak
Offer onabotulinum toxin A external sphincter injections before more invasive techniques as long as the patient is informed that the evidence to support this treatment is of low quality.	Weak
Offer sacral nerve stimulation to women with UAB refractory to conservative measures.	Strong
Do not routinely offer detrusor myoplasty as a treatment for detrusor underactivity.	Weak

Follow-up

Natural history and clinical evolution at long-term follow-up of women with detrusor underactivity is not well known. The interval between follow-up visits will depend on patient characteristics, treatments given and the frequency of urinary complications.

Bladder Outlet Obstruction

Bladder outlet obstruction is defined by the ICS as *'obstruction during voiding, characterised by increased detrusor pressure and reduced urine flow rate'*.

Classification of BOO

Recommendation	Strength rating
Use standardised classification of bladder outlet obstruction (BOO) in women (anatomical or functional) and research populations should be fully characterised using such classification.	Strong

Diagnostic evaluation of BOO

Recommendations	Strength rating
Take a full clinical history and perform a thorough clinical examination in women with suspected bladder outlet obstruction (BOO).	Strong
Do not rely on measurements from urine flow studies alone to diagnose female BOO.	Strong
Perform cystourethroscopy in women with suspected anatomical BOO.	Strong
Perform urodynamic evaluation in women with suspected BOO.	Strong

Conservative treatment of BOO

Recommendations	Strength rating
Offer pelvic floor muscle training (PFMT) aimed at pelvic floor muscle relaxation to women with functional bladder outlet obstruction (BOO).	Weak
Prioritise research that will investigate and advance the understanding of the mechanisms and impact of PFMT on the coordinated relaxation of the pelvic floor during voiding.	Strong
Offer the use of a vaginal pessary to women with grade 3 to 4 cystocoeles and BOO who are not eligible/inclined towards other treatment options.	Weak

Offer urinary containment devices to women with BOO to address urinary leakage as a result of BOO, but not as a treatment to correct the condition.	Weak
Offer clean intermittent self-catheterisation to women with urethral strictures or post-urinary incontinence surgery for BOO.	Weak
Do not offer an intraurethral device to women with BOO.	Strong

Pharmacologic treatment of BOO

Recommendations	Strength rating
Offer uroselective alpha-blockers, as an off-label option, to women with functional bladder outlet obstruction (BOO) following discussion of the potential benefits and adverse events.	Weak
Offer oral baclofen to women with BOO particularly those with increased electromyography activity and a sustained detrusor contraction during voiding.	Weak
Only offer sildenafil to women with BOO as part of a well-regulated clinical trial.	Strong
Do not offer thyrotropin-releasing hormone to women with BOO.	Strong

Surgical treatment of BOO

Recommendations	Strength rating
Offer intra-sphincteric injection of botulinum toxin to women with functional bladder outlet obstruction (BOO).	Weak

Offer sacral neuromodulation to women with functional BOO.	Weak
Advise women with voiding symptoms associated with pelvic organ prolapse that symptoms may improve after surgery.	Weak
Offer urethral dilatation to women with urethral stenosis causing BOO, but advise on the likely need for repeated intervention.	Weak
Offer internal urethrotomy with postoperative urethral self-dilatation to women with BOO due to urethral stricture disease but advise on its limited long-term improvement and the risk of postoperative urinary incontinence (UI).	Weak
Do not offer urethral dilatation or urethrotomy as a treatment for BOO to women who have previously undergone midurethral synthetic tape insertion due to the theoretical risk of causing urethral mesh extrusion.	Weak
Inform women of limited long-term improvement (only in terms of post void residual volume and quality of life) after internal urethrotomy.	Weak
Offer bladder neck incision to women with BOO secondary to primary bladder neck obstruction.	Weak
Advise women who undergo bladder neck incision on the small risk of developing stress urinary incontinence (SUI), vesico-vaginal fistula or urethral stricture postoperatively.	Strong

Offer urethroplasty to women with BOO due to recurrent urethral stricture after failed primary treatment.	Weak
Caution women on the possible recurrence of strictures on long-term follow-up after urethroplasty.	Weak
Offer urethrolysis to women who have voiding difficulties after anti-UI surgery.	Weak
Offer sling revision (release, incision, partial excision, or excision) to women who develop urinary retention or significant voiding difficulty after tape surgery for UI.	Strong
Caution women about the risk for recurrent SUI and the need for a repeat/concurrent anti-UI surgery after sling revision.	Strong

Follow-up

Women with BOO should be followed up and monitored regularly due to the risk of further deterioration of voiding or renal function in case of persistence and progression of the obstruction. For those who received treatment, monitoring must be undertaken for the recurrence of the BOO. In particular, women who underwent urethral dilation, urethrotomy or urethroplasty for urethral stricture need to be monitored for the recurrence of the stricture.

Nocturia

Nocturia was defined by the ICS in 2002 as 'the complaint that the individual has to wake at night one or more times to void' and quantified in an updated document in 2019 as *'the number of times an individual passes urine during their main sleep period, from the time they have fallen asleep up to the intention to rise from that period'*.

Diagnostic evaluation of nocturia

Recommendations	Strength rating
Take a complete medical history from women with nocturia.	Strong
Use a validated questionnaire during the assessment of women with nocturia and for re-evaluation during and/or after treatment.	Weak
Use a three-day bladder diary to assess nocturia in women.	Strong
Do not use nocturnal-only bladder diaries to evaluate nocturia in women.	Weak

Conservative management of nocturia

Recommendations	Strength rating
Offer women with LUTS lifestyle advice prior to, or concurrent with, treatment.	Strong
Offer pelvic floor muscle training for nocturia (either individually or in the group setting) to women with urinary incontinence or other storage LUTS.	Strong
Offer women with nocturia and a history suggestive of obstructive sleep apnoea a referral to a sleep clinic for an assessment of suitability for continuous positive airway pressure treatment.	Strong

Pharmacological management of nocturia

Recommendations	Strength rating
Offer desmopressin treatment for nocturia secondary to nocturnal polyuria to women, following appropriate counselling regarding the potential benefits and associated risks (including hyponatraemia).	Strong
Carefully monitor serum sodium concentration in elderly patients treated with desmopressin. Avoid prescribing desmopressin to patients with a baseline serum sodium concentration below normal range.	Strong
Offer anticholinergic treatment for nocturia to women with urgency urinary incontinence or other LUTS, following appropriate counselling regarding the potential benefits and associated risks.	Strong
Inform women with nocturia that combination of behavioural therapy and anticholinergic drugs is unlikely to provide increased efficacy compared with either modality alone.	Weak
Offer combination of anticholinergics and desmopressin to women with overactive bladder and nocturia secondary to nocturnal polyuria, following appropriate counselling regarding the potential benefits and associated risks.	Weak
Offer vaginal oestrogen treatment to women with nocturia, following appropriate counselling regarding the potential benefits and associated risks.	Weak

Offer timed diuretic treatment to women with nocturia secondary to polyuria, following appropriate counselling regarding the potential benefits and associated risks.	Weak

Follow-up

The follow-up of patients with nocturia will be dependent on both the underlying aetiology of this symptom and the treatment given.

Pelvic organ prolapse and LUTS

Detection of SUI in women with pelvic organ prolapse

Recommendation	Strength rating
Perform pelvic organ prolapse (POP) reduction test in continent women to identify those with occult stress urinary incontinence and counsel them about the pros and cons of additional anti-incontinence surgery at the time of POP surgery.	Strong

Conservative treatment of POP and LUTS

Recommendations	Strength rating
Inform women with pelvic organ prolapse (POP), who do not need a vaginal pessary or surgical intervention, about the potential relief from LUTS from pelvic floor muscle treatment (PFMT).	Strong
Do not offer preoperative PFMT to improve outcome of LUTS if pessary therapy or surgical intervention is indicated for POP.	Strong

Surgery for bothersome POP

Recommendations for women requiring surgery for bothersome pelvic organ prolapse (POP) who have symptomatic or occult SUI	Strength rating
Offer simultaneous surgery for POP and stress urinary incontinence only after a full discussion of the potential risks and benefits of combined surgery vs. POP surgery alone.	Strong
Inform women of the increased risk of adverse events with combined prolapse and anti-urinary incontinence surgery compared to prolapse surgery alone.	Strong
Recommendations for women requiring surgery for bothersome POP who do not have symptomatic or occult SUI	
Inform women that there is a risk of developing *de novo* SUI after prolapse surgery.	Strong
Warn women that the benefit of combined surgery for POP and SUI may be outweighed by the increased risk of adverse events compared to prolapse surgery alone.	Strong

Urinary Fistula

Epidemiology, aetiology and pathophysiology of urinary fistula

Summary of evidence	LE
The risk of injury to the urinary tract and subsequent fistula formation is higher in women with malignant disease undergoing radical surgery than in women with benign disease undergoing simple surgical procedures.	2
The rate of fistula formation following radiotherapy for gynaecological cancer appears to be of the same order as that following surgical treatment.	4

Adapted WHO Classification of fistulae*

Simple fistula with good prognosis	Complex fistula with uncertain prognosis
• Single fistula < 4 cm • Vesico-vaginal fistula • Closing mechanism not involved • No circumferential defect • Minimal tissue loss • Ureters not involved • First attempt to repair	• Fistula > 4 cm • Multiple fistula • Recto-vaginal mixed fistula, cervical fistula • Closing mechanism involved • Scarring • Circumferential defect • Extensive tissue loss • Intravaginal ureters • Failed previous repair • Radiation fistula

**Although this classification was developed for obstetric fistula initially, it could be relevant for iatrogenic fistula as well.*

Classification of urinary fistula

Recommendation	Strength rating
Use a classification system for urinary tract fistulae to try to standardize terminology in this subject area.	Strong

Management of urinary fistula

Recommendations	Strength rating
General	
When reporting on outcomes after fistula repair, authors should make a clear distinction between fistula closure rates and postoperative urinary incontinence rates and the time at which the follow-up was organised.	Strong
Do not routinely use ureteric stents as prophylaxis against injury during routine gynaecological surgery.	Strong
Suspect ureteric injury or fistula in patients following pelvic surgery if a fluid leak or pelvicalyceal dilatation occurs postoperatively, or if drainage fluid contains high levels of creatinine.	Strong
Use 3-dimentional imaging techniques to diagnose and localise urinary fistulae, particularly in cases with negative direct visual inspection or cystoscopy.	Weak
Manage upper urinary tract fistulae initially by conservative or endoluminal techniques where such expertise and facilities exist.	Weak

Surgical principles	
Surgeons involved in fistula surgery should have appropriate training, skills, and experience to select an appropriate procedure for each patient.	Weak
Attention should be given as appropriate to skin care, nutrition, rehabilitation, counselling and support prior to, and following, fistula repair.	Weak
Tailor the timing of fistula repair to the individual patient and surgeon requirements once any oedema, inflammation, tissue necrosis, or infection, are resolved.	Weak
Ensure that the bladder is continuously drained following fistula repair until healing is confirmed (expert opinion suggests: ten to fourteen days for simple and/or post-surgical fistulae; fourteen to twenty one days for complex and/or post-radiation fistulae).	Weak
Where urinary and/or faecal diversions are required, avoid using irradiated tissue for repair.	Weak
Use interposition graft when repair of radiation-associated fistulae is undertaken.	Weak
Repair persistent uretero-vaginal fistulae by an abdominal approach using open, laparoscopic or robotic techniques according to availability and competence.	Weak
Urethro-vaginal fistulae should preferably be repaired by a vaginal approach.	Weak

Urethral diverticulum

A female urethral diverticulum is a sac-like protrusion composed of the entire urethral wall or only by the urethral mucosa, situated between the peri-urethral tissues and the anterior vaginal wall.

Classification*

Localisation	Mid-urethral Distal Proximal Full length
Configuration	Single Multiloculated Saddle shaped
Communication	Mid-urethral No communication visualised Distal Proximal
Continence	Stress urinary incontinence Continent Post-void dribble Mixed incontinence

**Limited LNS C3 classification of urethral diverticula.*

Management of urethral diverticulum

Recommendations	Strength rating
Offer surgical removal of symptomatic urethral diverticula.	Weak
If conservative treatment is adopted, warn patients of the small (1–6%) risk of cancer developing within the diverticulum.	Weak

Carefully question and investigate patients for co-existing voiding dysfunction and urinary incontinence (UI).	Strong
Following appropriate counselling, address bothersome stress urinary incontinence at the time of urethral diverticulectomy with concomitant non-synthetic sling.	Weak
Counsel patients regarding the possibility of *de novo* or persistent LUTS including UI despite technically successful urethral diverticulectomy.	Strong

This short booklet text is based on the more comprehensive EAU Guidelines (ISBN 978-94-92671-16-5) available to all members of the European Association of Urology at their website, http://www.uroweb.org/guidelines.