EAU GUIDELINES ON NON-NEUROGENIC FEMALE LUTS

(Limited text update March 2023)
C.K. Harding (Chair), M.C. Lapitan (Vice-chair), S. Arlandis, K. Bø, H. Cobussen-Boekhorst, E. Costantini, J. Groen, A.K. Nambiar, M.I. Omar, B. Peyronnet, V. Phé, C.H. van der Vaart
Guidelines Associates: F. Farag, M. Karavitakis, M. Manso, S. Monagas, L. Moris, A. Nic an Riogh, E. O'Connor, N. Sihra, L. Tzelves
Guidelines Patient Advocates: M. de Heide, T. van den Bos, M.L. van Poelgeest-Pomfret
Guidelines office: N. Schouten

Introduction

The recent edition of the guidelines have 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-micturition 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 carry out 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
Validated symptom scores measure the severity of urinary incontinence and LUTS.	3
Both condition-specific and general health status questionnaires measure current health status and are sensitive to change following treatment.	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 patients with LUTS.	Strong
If an urinary tract infection is present then reassess LUTS after treatment.	Strong
Do not routinely treat asymptomatic bacteriuria in elderly patients with the aim of improving 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
Use bladder voiding efficiency as an additional parameter when measuring PVR volume.	Weak

Urodynamics

Summary of evidence	LE
Urodynamics provide comprehensive analysis of LUT function underlying different clinical conditions.	4
Most urodynamic parameters show variability within the same session and over time.	3
Different techniques of measuring urethral function may have good test–retest reliability, but do not consistently correlate to other urodynamic tests or to the severity of urinary incontinence.	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.	1a
Preoperative 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 results of urethral function tests and subsequent success or failure of SUI surgery.	3
There is no consistent evidence that preoperative DO is associated with failure of mixed urinary incontinence surgery in women.	3

The presence of preoperative DO may be associated with persistence of 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.	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 as *'urinary urgency, usually accompanied by frequency and nocturia, with or without urge urinary incontinence, in the absence of urinary tract infection (UTI) or other obvious pathology'*.

Diagnostic evaluation

Recommendations	Strength rating
Request that patients complete at least a three-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.

Conservative management of overactive bladder

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.	Strong

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 OAB wet, either for temporary symptom control or when other treatments are not planned or feasible.	Strong
Offer prophylactic antibiotics to patients with recurrent urinary tract infections only after discussion regarding the risk of increasing antimicrobial resistance.	Strong

Lifestyle interventions

Summary of evidence	**LE**
Reduction of caffeine intake may reduce symptoms of frequency and urgency.	2
Reduction in fluid intake by 25% may help improve symptoms of OAB but not urinary incontinence (UI).	1b
Personalised fluid intake advice when added to pharmacotherapy provides no additional benefit in patients with OAB.	2
Obesity is a risk factor for UI in women, but the relationship to other OAB symptoms remains unclear.	1b
There is weak evidence that smoking cessation improves symptoms of OAB.	3

Recommendations	**Strength rating**
Advise adults with overactive bladder (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

Encourage overweight and obese adults with OAB/urinary incontinence to lose weight and maintain weight loss.	Strong
Provide smoking cessation strategies to patients with OAB who smoke.	Strong

Behavioural and physical therapies

Summary of evidence	**LE**
Prompted voiding, either alone or as part of a behavioural modification programme, improves continence in elderly, care-dependent, people in the short-term.	1b
Bladder training is effective for improvement of urge urinary incontinence (UUI) in women but efficacy appears to be lower than that of pharmacotherapy.	1b
Pelvic floor muscle training may improve symptoms of frequency of overactive bladder (OAB) in women.	1b
Electrical stimulation may improve symptoms of OAB in some women, but the type and mode of delivery of ES remains variable and poorly standardised.	1a
Posterior tibial nerve stimulation (PTNS) is more effective than antimuscarinics in reducing UUI episodes but with no difference in improving other OAB symptoms	1a
A maintenance programme of percutaneous-PTNS (P-PTNS) has been shown to be effective for up to 3 years.	2a
Transcutaneous-PTNS appears to be effective in reducing OAB symptoms compared to sham treatment.	1a
Transcutaneous-PTNS is not inferior to P-PTNS with regards to improvement in urinary urgency, frequency and quality of life scores.	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/urge 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 symptomatic improvement of OAB/UUI.	Strong

Pharmacological management

Anticholinergic drugs

Summary of evidence	LE
Anticholinergic drugs are effective in improving overactive bladder (OAB) symptoms, decreasing urinary urgency incontinence episodes, decreasing daily urgency and frequency episodes and increasing mean voided volumes, compared with placebo.	1a
Anticholinergic drugs caused higher adverse events than placebo including dry mouth, cognitive impairment and constipation	1a
Once daily extended-release formulations are associated with lower rates of adverse events compared to immediate-release preparations.	1b
Transdermal oxybutynin is associated with lower rates of dry mouth than oral anticholinergic drugs are, but has a high rate of withdrawal due to skin reactions.	1b

Higher doses of anticholinergic drugs are more effective to improve OAB symptoms but exhibit a higher risk of adverse effects.	1a
No anticholinergic drug is clearly superior to another for cure or improvement of OAB/urge urinary incontinence.	1a
The combination of antimuscarinics plus another treatment modality was more effective than antimuscarinics alone in improving OAB.	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 anticholinergic 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

Mirabegron

Summary of evidence	LE
Mirabegron and vibegron are better than placebo for improvement of overactive bladder (OAB)/urge urinary incontinence symptoms.	1a
Adverse event rates with mirabegron and vibegron are similar to those of placebo.	1a
Beta-3 agonists are as effective as antimuscarinics in the management of OAB but with lower dry mouth rates.	1a
Patients inadequately treated with solifenacin 5 mg may benefit more from the addition of mirabegron rather than dose escalation of solifenacin.	1b

Recommendations	Strength rating
Offer beta-3 agonists as an alternative to anticholinergics to women with overactive bladder who fail conservative treatment.	Strong
Offer mirabegron as an additional therapy in patients who are inadequately treated with solifenacin 5 mg.	Weak

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 women 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 onabotulinumtoxinA

Summary of evidence	LE
A single treatment of onabotulinumtoxinA (onabotA) (100 U) injected in the bladder wall is more effective than placebo at curing and improving urge urinary incontinence (UUI)/overactive bladder symptoms and improving quality of life.	1a
There is no evidence that repeated injections of onabotA have reduced efficacy, but discontinuation rates are high.	2a
There is a risk of voiding dysfunction, increased post void residual volume and urinary tract infection with onabotA injections.	1a
The risk of bacteriuria after onabotA (100 U) injection is high but the clinical significance of this remains uncertain.	1b

OnabotulinumtoxinA is more effective in curing UUI but similarly effective in reducing mean UUI episodes compared with antimuscarinics.	1a
OnabotulinumtoxinA is associated with higher rates of voiding dysfunction than antimuscarinics.	1a

Recommendations	Strength rating
Offer bladder wall injections of onabotulinumtoxinA (100 U) to patients with overactive bladder / urge urinary incontinence 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 offering treatment with onabotulinumtoxinA.	Strong

Sacral nerve stimulation

Summary of evidence	LE
Sacral Nerve Stimulation (SNS) is more effective than continuation of failed conservative treatment for overactive bladder/urge urinary incontinence (UUI), but no sham controls have been used.	1b
Sacral nerve stimulation is as effective as onabotulinumtoxinA 200 U detrusor 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/urge 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 life-long support both prior to and after major surgery as a treatment for overactive bladder (OAB) is provided by a specialist nurse or equivalent health care provider.	Strong
Offer augmentation cystoplasty to patients with OAB/urge urinary incontinence (UUI) who have failed all other treatment options and have been informed about all possible complications.	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 will 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 overactive bladder 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 onabotulinumtoxinA, as required, to women in whom it has been effective (refer to the manufacturer's 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 stress urinary incontinence (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 overactive bladder (OAB), are present, consider a possible diagnosis of mixed urinary incontinence.
- 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/urge urinary incontinence.

Diagnostic evaluation

History taking and physical examination

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

Patient questionnaires

Recommendation	Strength rating
Use a validated and appropriate questionnaire as part of the standardized 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 urodynamic testing 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 urethral function tests and subsequent success or failure of SUI surgery.	3
There is no consistent evidence that preoperative detrusor overactivity is associated with surgical failure of mid-urethral sling (MUS) in women.	3

Recommendations	Strength rating
Perform preoperative urodynamic tests in cases of stress urinary incontinence (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

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

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
Consider electrical stimulation for treatment of SUI, or as an adjunct for teaching PFM contraction.	Weak

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 (HRT) who develop or experience worsening SUI, discuss alternative HRTs.	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, after 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 stress urinary incontinence 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 stress urinary incontinence

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
Employ a shared decision-making approach when deciding on appropriate treatment for SUI.	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
High cure rates are associated with autologous sling placement for treatment of stress urinary incontinence (SUI).	1a
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 infections, but a lower rates of pelvic organ prolapse 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 slings (MUS), colposuspension or autologous sling for cure of SUI and repeat injections may be required in order to achieve sustained benefits.	1b
Autologous fat and hyaluronic acid as bulking agents have a higher risk of adverse events.	1a
Adverse event rates for urethral bulking agents are lower compared to open surgery.	2a
There is no evidence that one type of bulking agent is better than another.	1b
The periurethral route of injection of bulking agents may be associated with a higher risk of urinary retention compared to the transurethral route.	2b

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 (SUI), compared with colposuspension.	1a

Synthetic MUSs inserted by the transobturator or retropubic route provide equivalent patient-reported outcomes at one year.	1a
Synthetic MUSs 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
Long-term analysis of MUS showed no difference in terms of efficacy for the skin-to-vagina (outside-in) compared to vagina-to-skin (inside-out) directions up to nine years.	2a
The top-to-bottom (inside-out) direction in the retropubic approach is associated with a higher risk of postoperative voiding dysfunction.	1b
The comparative efficacy of Ajust® and Altis® single-incision slings against conventional MUS at fifteen and 36 months is non inferior.	1b
Operating times for insertion of single-incision MUSs are shorter than for standard retropubic slings.	1b
Blood loss and immediate postoperative pain are lower for insertion of single-incision slings compared with conventional MUS.	1b
The rate of mesh exposure, repeat SUI surgery and dyspareunia at three years is higher for single incision slings (Ajust® and Altis®) compared to conventional MUS.	1b

There is no evidence that other adverse outcomes from surgery are more or less likely with single-incision slings than with conventional MUS.	1b
In women undergoing surgery for SUI, coital incontinence is likely to improve.	3
Overall, there is conflicting evidence regarding sexual function following SUI surgery.	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 single-incision slings (Ajust® and Altis®), that short term efficacy appears equivalent compared to conventional MUS.	Strong
Inform women who are being offered a single-incision sling that long-term efficacy remains uncertain.	Strong

Other treatments of uncomplicated stress urinary incontinence

Recommendations	Strength rating
Offer mechanical devices to women with mild-to-moderate stress urinary incontinence (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 stress urinary incontinence

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 primary surgical treatment for SUI as part of a well-regulated research study.	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 stress urinary incontinence 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 stress urinary incontinence (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 post-operative phase.

Mixed Urinary Incontinence

The term 'mixed urinary incontinence' 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 mixed urinary incontinence.	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 mixed urinary incontinence

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

Pelvic floor muscle training is better than no treatment for improving urinary incontinence and quality of life in women with MUI.	1a
Bladder training combined with PFMT may be beneficial in the treatment of MUI.	1b

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 mixed urinary incontinence

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 mixed urinary incontinence

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 for treatment of women with UAB.	Strong
Offer alpha-adrenergic 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 onabotulinumtoxinA external sphincter injections before more invasive techniques as long as patients are informed that the evidence to support this treatment is of low quality.	Weak
Offer sacral nerve stimulation to women with UAB refractory to conservative treatment.	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 DU 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 bladder outlet obstruction

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

Diagnosis of bladder outlet obstruction

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 cysto-urethroscopy in women with suspected anatomical BOO.	Strong
Perform urodynamic evaluation in women with suspected BOO.	Strong

Conservative treatment of bladder outlet obstruction

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-dilatation 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 bladder outlet obstruction

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 bladder outlet obstruction

Recommendations	Strength rating
Offer intra-sphincteric injection of onabotulinumtoxinA 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 bladder outlet obstruction (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'*.

Diagnosis of nocturia

Recommendations	Strength rating
Take a complete medical history from women with nocturia, including screening for sleep disorders.	Strong
Use a validated questionnaire during 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

Consider screening for sleep disorders and performing renal function, thyroid function, HbA1c and calcium level blood tests in the initial workup of women presenting with nocturia as predominant symptom.	Strong

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 urge 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 stress urinary incontinence 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 pelvic organ prolapse 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 training (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 pelvic organ prolapse

Recommendations for women requiring surgery for bothersome pelvic organ prolapse (POP) who have symptomatic or occult stress urinary incontinence (SUI)	Strength rating
Offer simultaneous surgery for POP and SUI 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
Do not offer concomitant anti-incontinence surgery at the time of abdominal prolapse surgery.	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 external beam 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

Diagnostic evaluation of urinary fistula

Recommendations	Strength rating
Take a complete medical history and perform a focused physical examination including direct visual inspection for evaluation of women with suspicion of urinary fistula.	Strong
Use cystoscopy and retrograde bladder filling with a coloured fluid to confirm the diagnosis of urinary fistula.	Weak
Contrast-enhanced computed tomography with late excretory phase and magnetic resonance imaging can be used in cases where the diagnosis of urinary fistula is challenging or to provide additional diagnostic information.	Weak

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 three-dimensional 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 21 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 urogenital fistulas 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
Use magnetic resonance imaging for diagnosis and characterisation of urethral diverticula, with urethroscopy, voiding cystourethrogram and ultrasound where necessary.	Weak
Offer surgical removal of symptomatic urethral diverticulum.	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 coexisting 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 Female LUTS Guidelines (ISBN ISBN 978-94-92671-23-3), available on the EAU website, http://www.uroweb.org/guidelines.