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A comparison of the National Institute for Health and Care Excellence (NICE) and European Association of Urology (EAU) guidelines for the assessment and management of urinary incontinence in women

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Abstract

Objective: The objective of this paper is to identify the similarities and key differences between the National Institute for Health and Care Excellence (NICE) and European Association of Urology (EAU) guidelines on the management of urinary incontinence (UI) in women.

Methods: We reviewed the most recent iterations of both full guidelines to identify all key recommendations and their associated level/grade of evidence. Guidance on the management of urinary incontinence in men and neuropathic patients was excluded.

Results: There is a significant overlap in the recommendations of both guidelines. Key differences include the indications for performing urodynamics, pharmacological agents in stress UI, the dose of botulinum toxin A (200 units by NICE, 100 units by EAU), the hierarchy of surgical options for primary stress UI and the role of the multi-disciplinary team (MDT).

Conclusion: This review provides the various stakeholders involved in the management of female UI with a summary of the strength of evidence supporting the recommendations by these two key guidelines. We have provided an evidence-based framework to support clinical experience from which to base management decisions.

Keywords

Urinary incontinence, guidelines, urodynamics, antimuscurinics, urinary incontinence surgery

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Introduction

Urinary incontinence (UI), the complaint of any involuntary leakage of urine,[1] is a common and significant issue for health services worldwide. The British Association of Urological Surgeons (BAUS) suggest a conservative estimate of approximately 3 million sufferers in the United Kingdom (UK).[2] Ninety-five per cent of cases of urinary leakage are stress (SUI) and/or urgency incontinence (UUI), with a plethora of treatment options available to the healthcare professional involved in their management. Here, we appraise and compare the guidelines most relevant to UK practice. These are provided by the National Institute for Health and Care Excellence (NICE) (first published in 2006 with a significant update in 2013 and minor changes in 2015),[3] and the European Association of

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Urology (EAU) (first published in 2007, updated annually and most recently in 2016).[4] These guidelines are aimed at providing high-level evidence-based advice to a range of stakeholders in the treatment of UI; namely, urologists, urogynaecologists, general practitioners, continence specialist nurses, continence therapists and patients themselves. We aim to provide clarity where there is good evidence and accepted consensus, and identify where the two organisations differ in their recommendations, suggesting associated explanations and options for treatment.

Guideline content

Both the NICE and EAU guidelines follow a similar stepwise management algorithm for their treatment recommendations. They build from lifestyle adjustment and conservative management through pharmacological therapies to surgical intervention. For the most part, similar clinical questions and management strategies are discussed in the two guidelines, the details of which we will set out below. Of note, the EAU guidance includes a section on the management of post-prostatectomy UI in men, not discussed in the NICE guidelines. This is not within the scope of this review. Furthermore, the EAU guidelines consider specific recommendations for elderly women, the management of whom are not differentiated by NICE.

The NICE guidelines are being updated to include further advice on surgical management in SUI, the management of mesh-related complications and the holistic management of pelvic organ prolapse (POP). The currently expected publication date for this is February 2019, and thus, NICE recommendations regarding this are not included in this review.

Methods

We identified whether an intervention was recommended in each guideline and the level/grade of evidence behind the recommendation. If more than one different level of evidence was appropriate for each recommendation, we have used the highest level. If no specific level has been provided by the guideline then the respective summary table entry has been left blank.

Assessment and investigation

History and examination

Both guidelines suggest taking a history as the first step in the assessment of UI with a view to categorising the incontinence as either SUI, UUI or mixed UI (MUI) and therefore guiding treatment (see Table 1). Further details of an obstetric and gynaecological history, past surgical history and a note of current medications should be taken. NICE also recommend eliciting a history of bowel symptoms. The history should identify other causative factors, particularly those that are suggestive of a more sinister aetiology, e.g. malignancy or fistula. Neither guideline mentions the use of a patient-centred approach at this initial stage of assessment, for example, the expectations, goal setting, goal achievement and satisfaction (EGGS) tool,[5] to aid identification of an early clear treatment direction.

Both guidelines advise abdominal and pelvic examination which includes digital examination of the vagina ± rectum and identification of a POP. NICE also recommend cognitive assessment in the elderly with complex medical comorbidities.

Questionnaires

EAU guidance suggests validated symptom/quality of life questionnaires can be used in the identification of UI, assessment of severity and to measure the response to treatment. In contrast, the NICE guidelines recommend their use only for assessing the impact of treatment. Furthermore, NICE provide a list of specific questionnaires it recommends for use based on a good level of evidence. This contrasts with the EAU guidance, which suggests the decision as to which questionnaire to use is at the discretion of the clinician. Of note, two tools recommended by NICE are not included in EAU guidance at all. These are the Bristol Female Lower Urinary Tract Symptoms (BFLUTS) score[6] and SEAPI-QMM.[7]

Bladder diaries

Both guidelines recommend the use of bladder diaries, NICE specifying for at least three days, EAU for three to seven days. NICE also recommend including a variety of days, i.e. both normal working and leisure days.

Diagnostic tests

Urine testing. Both guidelines recommend urinalysis as a first-line test in all who present with UI (see Table 2). As a consequence of its high specificity, a test that is negative for both leucocytes and nitrites can be used to rule out urinary tract infection (UTI).[8] NICE guidelines, unlike the EAU, specify that asymptomatic women should not be treated for a UTI until the results of a mid-stream urine culture is known. There is no recommendation in either guideline relating to pregnant women and UI. The EAU highlight that asymptomatic bacteriuria in the elderly should not be treated as a means for improving UI, as up to 60% of older women have an asymptomatic bacteriuria.[9] Furthermore, eradicating the bacteriuria does not improve incontinence.[10]

Post-void residual (PVR) volumes. Both guidelines recommend the use of bladder scans (ultrasound) as first-line measurement of PVR. Urethral catheterisation is a more accurate but invasive second-line option that also has a greater risk of adverse events. Both guidelines recommend measuring PVR when there are symptoms suggestive of voiding dysfunction. The EAU also suggest PVR

Table 1. Initial assessment recommendations.

Recommendation	EAU	Level/Grade	NICE	Level	Comment
Detailed history to determine type of UI	Yes		Yes	4	
Detailed obstetric history	Yes		Yes		
Exclude other disorders	Yes		Yes*		
Physical Examination	Yes		Yes		
Pelvic examination	Yes		Yes	4	
Examine for POP	Yes		Yes	3	
SUI on examination	No		No		
EGGS*	No		No		
Questionnaires	Yes	B	Yes	3	To monitor changes
Three-day bladder diary	Yes	2b/A	Yes	3	
Seven-day bladder diary	Yes	2b/A	Yes	3	

EAU: European Association of Urology; NICE: National Institute for Health and Care Excellence; UI: urinary incontinence; POP: pelvic organ prolapse; SUI: stress urinary incontinence; EGGS: expectations, goal setting, goal achievement and satisfaction tool.
* = not a specific recommendation but noted with the body of the guideline text.

Table 2. Initial diagnostic test recommendations.

Recommendation	EAU	Level/Grade	NICE	Level	Comment
Urinalysis	Yes	1/A	Yes	2	
PVR	Yes	2/B	Yes	4	No consensus on abnormal PVR
Pad testing to quantify UI	Yes	2/C	No	3	
Pad testing to monitor changes	Yes	2/C	Yes	4	
Routine imaging	No	2b/A	No	3	Not recommended
Cystoscopy in uncomplicated UI	No		No	3	Not recommended

EAU: European Association of Urology; NICE: National Institute for Health and Care Excellence; PVR: post-void residuals; UI: urinary incontinence.

measurements are indicated when there is 'complex incontinence' (not defined further) and following interventions that may worsen voiding dysfunction. NICE guidelines highlight measurement in a woman who suffers with recurrent UTIs. There is no consensus amongst the two guidelines as to what is an abnormal PVR.

Pad testing. NICE guidelines do not recommend the use of routine pad testing but their guideline development group suggest there may be a role in assessing treatment effect. Conversely, the EAU guidelines suggest pad testing can be used to diagnose UI, quantify the amount leaked and as a measure of treatment outcome. This has been demonstrated following transvaginal tape (TVT) insertion and colposuspension for SUI.[11] Both guidelines suggest a 24-hour pad test has a greater sensitivity than a one-hour test but cannot conclude on the best testing protocol to use. Pad testing is more commonly used in the research domain compared with clinical practice. As highlighted by the International Continence Society, protocols that can be used and reproduced in the clinical setting are required to improve the uptake of pad testing as an easy, cheap and non-invasive aid to the assessment of UI.[11]

Imaging. Both guidelines agree no routine imaging or cystoscopy should be performed in the diagnostic work-up of UI.

Urodynamics. Both guidelines agree urodynamics do not need to be carried out before conservative management or

Table 3. Urodynamic testing recommendations.

Recommendation	EAU	Level/Grade	NICE	Level	Comment
Required before conservative treatment	No	1a/B	No	1	
Required before primary simple SUI surgery	No	1b	No	3	
Counsel that may not predict outcome	Yes	1a/C	Yes	4	
Required if previous SUI surgery			Yes	4	No EAU comment
Perform if outcome will affect treatment and management	Yes	1a/B	Yes	2	
Perform if diagnosis unclear			Yes		No EAU comment
Perform if symptoms suggest DO			Yes		No EAU comment
Perform if voiding dysfunction			Yes		No EAU comment
Perform if previous failed UI invasive treatment	Yes		Yes	C	
Ambulatory/video urodynamics if diagnosis remains unclear	No	2	Yes	3	
Perform UPP or LPP to grade UI severity	No	3/C	No		Not discussed in NICE
Other urethral competence tests**			No	3	No EAU comment

EAU: European Association of Urology; NICE: National Institute for Health and Care Excellence; SUI: stress urinary incontinence; DO: detrusor overactivity; UI: urinary incontinence; UPP: urethral pressure profile; LPP: leak point pressure.
** = Q-tip, Bonney, Marshall, Fluid-Bridge.

primary surgery for uncomplicated SUI because they do not affect the outcome of these treatments (see Table 3).[12,13]

The NICE guidance provides very specific instances for when urodynamics should be performed, namely, clinical suspicion of detrusor overactivity (DO), voiding dysfunction symptoms, prolapse and previous SUI surgery. It does not, however, provide clear high-level evidence for any of these recommendations. Conversely, the EAU provide much broader advice regarding the indications for performing urodynamics – when it will change your invasive management. A Cochrane review suggests that whilst urodynamic results do alter treatment decisions, it is unclear whether this actually affects patient outcomes.[13] The lack of detail from the EAU provides a less useful clinical tool, but perhaps better reflects the current level of evidence for the use of urodynamics in this setting.

NICE recommends ambulatory or video-urodynamics if standard urodynamics does not provide the answer. The EAU guideline group accept with level 2 evidence that ambulatory urodynamics is more sensitive but stop short of recommending when it should be used.

MUI

Both the EAU and NICE currently recommend treating the predominant symptom (Table 4). The EAU suggest results of SUI surgery are worse in patients with MUI.

Table 4. MUI treatment recommendations.

Recommendation	EAU	Level/Grade	NICE	Level
Treat predominant symptom first	Yes	C	Yes	4
Success of SUI surgery worse in MUI	Yes	1c/A		

EAU: European Association of Urology; NICE: National Institute for Health and Care Excellence; SUI: stress urinary incontinence; MUI: mixed urinary incontinence.

Conservative management

Lifestyle advice

High-level evidence to support the role of lifestyle modification on UI is lacking (Table 5). The EAU recommends treating other associated conditions including cardiac failure, renal failure, diabetes, depression and cognitive impairment although there is no evidence this will improve patients' UI. They also endorse reviewing medications and avoiding constipation; however, again the evidence for this is weak. Likewise, the role of long-term moderate exercise on female UI is unclear. These specific modifications are not recommended by NICE.

Table 5. Life style modification recommendations.

Recommendation	EAU	Level/Grade	NICE	Level	Comment
Treat associated medical conditions	Yes	3/A			
Review new medications	Yes	3/C			
Treatment of constipation	Yes	4/C	No	2	
Use of containment devices or disposable pads for light UI	Yes	1b/A	No	1+	No NICE comment
Pads/external devices/incontinence for moderate to severe UI	Yes	1b/A	No	1+	
Modification of fluid intake	Yes	2/C	Yes	1	
Smoking cessation	Yes	4/A	No	2	
Avoidance of caffeine	Yes	2/B	Yes	1	Reduces urgency and frequency but not UI
Weight loss	Yes	1b/A	Yes	1	

EAU: European Association of Urology; NICE: National Institute for Health and Care Excellence; UI: urinary incontinence.

Where there is a greater body of evidence, the two organisations agree in their recommendations. This includes weight loss, modification of fluid intake if required and avoidance of caffeine. Both the EAU and NICE recommend a trial of reducing caffeine intake to improve urgency and frequency symptoms (though it will not improve UI).[14] Interestingly, NICE discuss the significant improvements in incontinence noted in a few case series following bariatric surgery.[15,16] NICE guidance specifically advises healthcare workers to not recommend complementary therapies for managing UI.

Catheterisation

EAU guidance recommends the use of catheters as one of a number of options for management when other pharmacological or surgical interventions are ineffective, contraindicated or not wanted by the patient. They do not specifically make recommendations regarding the type, site or material of the catheter other than to suggest suprapubic catheterisation is associated with fewer urethral complications when compared with a long-term indwelling urethral catheter.

NICE guidance provides further detail in its recommendations. They suggest that an indwelling urethral catheter may not result in continence in UUI as a result of increased DO and highlight the use of intermittent catheterisation when possible. NICE also give strong guidance against the use of intravaginal or intraurethral devices.

Behavioural therapies

Prompting of the elderly cognitively impaired patient to void by carers is recommended by both guidelines to improve incontinence. Scheduled voiding, the regular preplanned voiding of urine at specified times, is recommended by NICE.

Bladder training is offered if a patient is suffering from UUI or MUI to alter voiding intervals. Evidence suggests it does help UUI if sustained.[17] Both sets of guidance suggest combination with antimuscarinics can improve frequency symptoms although not necessarily incontinence.[18]

Pelvic floor muscle training (PFMT)

EAU guidance on PFMT refers to a UK technology appraisal.[19] PFMT does improve UI particularly in women with SUI. The efficacy is improved with greater intensity, supervision and biofeedback. Both organisations say PFMT should be offered first line in SUI and MUI for at least three months (Table 6). It should also be offered in post-natal UI according to the EAU to increase the chances of continence at 12 months[20] and as primary prevention for women in their first pregnancy according to NICE. NICE do not recommend using biofeedback whilst the EAU recommend considering its use, despite explaining that the evidence is contradictory and therefore far from conclusive. Furthermore, NICE suggest digital examination to confirm pelvic floor contraction prior to referral, and they provide very specific guidance on the exercises required (i.e. 'at least eight contractions three times per day').

Electrical neurostimulation

NICE are very clear that transcutaneous nerve stimulation (of either sacral or posterior tibial nerves) should not be performed to treat overactive bladder (OAB). The EAU

Table 6. UUI treatment recommendations.

Recommendation	EAU	Level/Grade	NICE	Level	Comment
Scheduled voiding	No		Yes	I	
Prompted voiding in cognitive impairment	Yes	1b/A	Yes	I	
Combination bladder training and OAB drug	Yes	1b	Yes	I	Not a specific EAU recommendation
PFMT for at least three months	Yes	1/A	Yes	I	
PFMT to post-natal women with UI	Yes	1/A			Not specified in NICE
Consider using biofeedback	Yes	1/A	No	I	
P-PTNS for UUI if failed antimuscarinics	Yes	2b/B	Yes	I	Second-line treatment
T-PTNS	No	2a	No	I	
T-SNS	No		No	I	

EAU: European Association of Urology; NICE: National Institute for Health and Care Excellence; OAB: overactive bladder; PFMT: pelvic floor muscle training; UI: urinary incontinence; P-PTNS: percutaneous posterior tibial nerve stimulation; UUI: urgency urinary incontinence; T-PTNS: transcutaneous posterior tibial nerve stimulation; T-SNS: transcutaneous sacral nerve stimulation.

echo this. In regards to percutaneous posterior tibial nerve stimulation in UUI, the EAU suggest recommending if no improvement with antimuscarinics. NICE suggest this should be an option only if the woman does not want botulinum toxin A or percutaneous sacral nerve modulation (P-SNM) options and she has been discussed in an MDT.

Pharmacological management

Antimuscarinic drugs

Antimuscarinic drugs are the mainstay of treatment for overactive bladder symptoms in both continent (OAB dry) and incontinent (OAB wet) women. Both NICE and the EAU evaluated the use of the same 13 drug preparations, namely oxybutynin immediate release (IR), extended release (ER) and transdermal (TD), solifenacin, tolterodine IR and ER, fesoterodine, propiverine IR and ER, trospium IR and ER and darifenacin. The two groups agree that all preparations demonstrate an improvement in symptoms compared with placebo. However, there is no significant difference in the efficacy between the different drugs. A summary of their recommendations can be seen in Table 7.

The EAU guidelines do not make any specific recommendations as to which antimuscarinic should be used first line other than to say IR preparations should be used initially. In contrast, NICE provide a specific list of three first-line antimuscarinics: oxybutynin IR, tolterodine IR and darifenacin once-daily preparation. To evaluate all of the 13 agents, NICE performed their own *de novo* network meta-analysis combining trials where individual drugs were compared to placebo, instead of using the evidence from the few randomised trials directly comparing more than one preparation in the same study. The quality of evidence of the included studies was of a high standard but the differences in study populations used across a number of trials mean that these data may not be fully reliable. Of note, the three first-line agents recommended by NICE are the three with the lowest cost per quality-adjusted life years.

Both guidelines agree on the recommendation not to use oxybutynin in elderly patients as a result of the increased risk of cognitive impairment. They also suggest the assessment of a patient's total anticholinergic load prior to prescribing new OAB drugs, again particularly in the elderly.

The NICE guidelines provide a significant emphasis on the fact that the first part of the pathway for the management of women with UI can and should be carried out in the primary care setting. This is particularly emphasised for the initiation of first-line pharmacological therapy. The EAU guidelines do not take this approach. NICE recommend a follow-up review at four weeks following the start of a new therapy (or sooner if significant side effects). The EAU recommend review within 30 days.

NICE recommend against the use of flavoxate, propantheline and imipramine. EAU guidance does not discuss these agents.

Mirabegron

Mirabegron is a beta 3 agonist targeting receptors in the detrusor muscle leading to smooth muscle relaxation.

NICE guidelines refer readers to the linked NICE Technology appraisal (TA290).[21] NICE recommend use only if antimuscarinics are ineffective, contraindicated or produce intolerable side effects. EAU does not provide

Table 7. Drug treatment recommendations.

Recommendation	EAU	Level/Grade	NICE	Level	Comment
Antimuscarinics first line	Yes	1a/A	Yes	I	
Antimuscarinics iso-effective	Yes	1a/A	Yes	I	
IR first line/ER second line	Yes	1b/A			NICE: not specified
Dose modification/alternate antimuscarinic if failure or side effects	Yes	A	Yes	I	
Transdermal oxybutynin if dry mouth	Yes	1b/B	Yes	I	
Offer early review	Yes	A	Yes	I	
Do not use oxybutynin in elderly	Yes	2/A	Yes	I	
Mirabegron as second line for UUI	Yes	1a/B	Yes	I+	
Duloxetine SUI and MUI	Yes	1a/B	No	I+	NICE: if surgery not an option
Topical oestrogen in post-menopausal women with vulvo-vaginal atrophy	Yes	1a a/A	Yes	I+	
Oral HRT worsens pre-existing UI/ increases risk of developing UI	Yes	1a/A	Yes	I+	
Desmospressin – short-term daytime	Yes	1b/B	No		
Desmospressin – short-term nocturia	No		Yes	I+	
Desmopressin – long term	No	1b/A	No		

EAU: European Association of Urology; NICE: National Institute for Health and Care Excellence; IR: immediate release; ER: extended release; UUI: urgency urinary incontinence; SUI: stress urinary incontinence; MUI: mixed urinary incontinence; HRT: hormone replacement therapy; UI: urinary incontinence.

such a clear hierarchy for when mirabegron can be prescribed but does support its use in UUI.

Other pharmacological agents

Duloxetine. Duloxetine is a serotonin and noradrenaline presynaptic reuptake inhibitor (SNRI). Its mechanism of action is thought to involve increased levels of serotonin and noradrenaline in the sacral spinal cord causing a greater stimulation of the pudendal motor nerves leading to increased urethral sphincter tone and closing pressure.

Both guidelines identify a significant frequency of side effects including gastrointestinal (GI) (nausea, vomiting and constipation) and dry mouth, insomnia, fatigue and dizziness. NICE recommend that it should not be offered first or second line for SUI or MUI unless surgery is not an option. The EAU suggest it can be used for temporary improvement (does not cure the UI). See Table 7.

Oestrogen. Both guidelines agree that we should offer topical vaginal oestrogens to post-menopausal women with vaginal atrophy but should not offer systemic oestrogens for UI.

Desmopressin. Desmopressin is a synthetic vasopressin. The evidence presented by both guidelines is that use helps incontinence in the very short term only.[22] NICE recommend its use only to treat nocturia that is particularly affecting quality of life. In contrast, EAU guidance recommends the unlicensed use for short-term daytime incontinence. More important, however, desmopressin causes significant side effects including hyponatraemia for which monitoring would be required, as well as headaches, nausea, dizziness, UTIs and peripheral oedema.

Diuretics. These are not discussed in the EAU guidelines. NICE suggest there is insufficient evidence and therefore they are not recommended for treatment of nocturia.

Surgical management

MDT

NICE recommend that every patient should undergo an MDT review before any invasive treatment is offered. Regional clinical networks should be in place to allow access to treatments that cannot be provided in smaller

Table 8. Invasive UUI treatment recommendations.

Recommendation	EAU	Level/Grade	NICE	Level	Comment
Botulinum toxin A for refractory UUI	Yes	1a/A	Yes	1	
Counsel re repeat injection, UTI, CISC	Yes	3/A	Yes		
Able to do CISC first	Yes	A	Yes		
Start at 200 U	No		Yes	1	
Start at 100 U	Yes	1a/A	No	1	
Botulinum toxin B			No	1	No EAU comment
SNM for refractory UUI	Yes	1b/A	Yes	1	
Counsel re long-term failure/complications	No		Yes	4	
Augmentation cystoplasty only for refractory DO not interested in Botox or SNM	Yes	C	Yes	3	
Counsel re CISC, short- and long-term complications	Yes	3/C	Yes	3	
Counsel re small risk of malignancy	Yes	3/C	Yes	4	
Urinary diversion if all other options unsuitable or fail	Yes	3/C	Yes	3	
Detrusor myectomy	No	3/C	No	3	
Vanilloid receptor agonists	No		No		

EAU: European Association of Urology; NICE: National Institute for Health and Care Excellence; UUI: urgency urinary incontinence; UTI: urinary tract infection; CISC: clean intermittent self-catheterisation; SNM: sacral nerve modulation; DO: detrusor overactivity.

hospitals. They also specify exactly who should be at the MDT: a urologist and urogynaecologist, a functional bowel sub-specialist colorectal surgeon if functional bowel disorders are involved, specialist nurse and specialist physiotherapist. For elderly patients a member of the elderly care team ± occupational therapist should be present. The EAU make no recommendations regarding MDT discussions.

MDTs were introduced in the UK in a bid to improve cancer services. There is a reasonable body of evidence looking at their efficacy in this scenario. The evidence for improvement in cancer outcomes is mixed.[23,24] In contrast, there is very little evidence looking at the use of MDT meetings in non-oncological conditions such as UI. MDTs are time consuming, resource heavy and costly. An estimate for the cost of MDT discussions for an individual cancer patient is approximately £428.[25] Allowing for a probable reduced cost in non-cancer cases due to the lower number of discussions per patient, fewer investigations to review and fewer specialists, this cost remains significant. Furthermore, whilst the rationale of having a larger number of experts reviewing a case is clear, it is likely to be difficult for all patients in non-subspecialist centres to be discussed.

UUI procedures

Botulinum toxin A. NICE recommend that botulinum toxin A should be offered only if there is urodynamic-proven DO and failure of conservative management. Women must have been trained in clean intermittent self-catheterisation (CISC) and able to perform it regularly if required. The EAU agree with this.

Importantly, NICE advise giving 200 units, unless women wish to reduce their chances of having to catheterise, in which case 100 units can be used. If effective, follow-up at least six-monthly or earlier if symptoms reoccur. They suggest that if treatment is ineffective the patient should be listed for repeat MDT discussion.

In contrast, the EAU recommends 100 units only and specifies injecting at 20 sites. This is a significant divergence between the guidelines (see Table 8). NICE performed their own meta-analysis of two studies that compare a range of doses for onabotulinum toxin A.[26,27] Their conclusions were, with very low levels of evidence, a clinical benefit in using 200 over 100 units and no difference in the rate of adverse events. Of note, the conclusion of one of the included studies was directly contradictory to this. Dmochowski et al. identified minimal additional

benefit from doses over 150 units and a dose of 100 units provided the best balance between treatment benefit and adverse event profile.[26] The second study by Altaweel at al. looked at only 22 patients and demonstrated no significant difference between the 100 unit and 200 unit groups.[27] A 2011 Cochrane review could not conclude on the optimum dose.[28]

Common accepted UK practice is in fact to give 100 units at each application with the 200 unit dosage used for those with neuropathic bladders. This is supported by phase 3 clinical trials published since the NICE guidance,[29] and in the 'Summary of Product Characteristics' for the drug ratified by the medicine licensing agencies.[30]

NICE specify that one should not use botulinum toxin B. The EAU guidelines do not mention this, although they do clearly describe the use of botulinum toxin A only.

P-SNM. NICE recommend P-SNM to be offered when conservative, pharmacological and botulinum toxin A treatment have failed and only before botulinum toxin A if the patient cannot perform CISC. The efficacy of this treatment is backed by a Cochrane review, although, of note, in none of the randomised controlled trials (RCTs) analysed were participants blinded because a successful first stage was an entry requirement.[31] In contrast, the EAU do not give any guidance regarding a difference in the sequence to be used for these treatments. In other words, either intradetrusor botulinum toxin A injection or P-SNM can be used once conservative therapy has failed.

Of note, the EAU recommend that as part of the two-stage approach, a permanent tined lead rather than a temporary wire electrode should be used for the first stage (level of evidence = 4). NICE do not make any recommendation for this, although it is widely acknowledged that this is a superior approach, primarily because it ensures no movement of the lead position between test and full treatment.[32]

Augmentation cystoplasty. The EAU suggest offering cystoplasty in cases of idiopathic DO if unsuccessful with non-surgical management and if botulinum toxin/P-SNM have been either unsuccessful or discussed and cannot be provided. NICE do not comment on where augmentation cystoplasty sits in the management algorithm compared to botulinum toxin or P-SNM. Both bodies highlight the importance of counselling patients on the key risks, namely needing to CISC and the small chance of malignancy. They also recommend lifelong follow-up. Neither guideline provides advice on what surveillance techniques should be used. Indeed, as suggested in a recent systematic review, this remains uncertain.[33]

Urinary diversion. Both guidelines suggest this is the final option in management of OAB. There is very little evidence for the use of urinary diversion techniques in idiopathic DO alone. Therefore, neither guideline provides further detail on the diversion technique to be used. Lifelong follow-up is recommended but again no detail is provided for what surveillance is needed including that of the defunctioned bladder. Patients must be able to live with and manage a stoma.

Other interventions. There is currently unclear evidence for the use of detrusor myectomy. Only case series have been reported and all patients had additional neurogenic bladder dysfunction.[34] Neither guideline recommends this treatment.

Vanilloid receptor agonists (resiniferatoxin) that act as capsaicin analogues to desensitise afferent neurons are discussed but not recommended by NICE. They are not discussed by the EAU. There is minimal evidence at present for use in various population groups,[35,36] but no definitive RCT evidence in women with simple drug-resistant UUI.

Primary SUI procedures

Mid-urethral slings (MUS)/colposuspension/autologous fascial slings (AFS). The EAU suggest there is no significant difference between the efficacy of treatment of SUI with a synthetic MUS compared with open colposuspension, but that colposuspension has more adverse events including urgency and voiding dysfunction. Consequently they recommend MUS to be used first line (Table 9). Colposuspension (open or laparoscopic – they do not recommend one surgical approach over the other) or AFS are to be advised only if an MUS is not appropriate. Unlike NICE, the EAU suggest AFS is more effective than colposuspension. This also contradicts a Cochrane systematic review in which no significant difference in efficacy is noted.[37] This disparity is, as they themselves suggest, a result of their use of a single RCT for this evidence.[38] Consequently, they do not make this a formal recommendation. In contrast, NICE recommend MUS, open colposuspension or autologous rectus fascial sling with no clear preference. They also suggest laparoscopic colposuspension should not be performed except by surgeons experienced in the procedure.

With regards to the MUS approach, both panels suggest similar efficacy of the retropubic vs transobturator technique. Transobturator provides less risk of intra-operative complications, namely bladder perforation but greater risk of longer-term complications including vaginal erosion and chronic pain, as identified by the EAU's own meta-analysis.[39] They do not specify whether one approach or the other should be used preferentially, nor what should influence that decision. The EAU recommend, based on Cochrane review data, for a retropubic tape the 'bottom-up' approach should be used as it is more effective and there are fewer adverse events compared with 'top-down'.[40] For the transobturator operations, they recommend an 'inside-out' technique because there are fewer

Table 9. Invasive SUI treatment recommendations.

Recommendation	EAU	Level/Grade	NICE	Level
Recommend MUS only as first surgical option	Yes	Ia/A	No	
Retropubic = transobturator cure	Yes	Ia	Yes	I
Counsel higher risk dyspareunia, vaginal erosion and chronic pelvic pain with transobturator MUS and higher risk bladder perforation and voiding dysfunction with RP	Yes	Ia/A	Yes	I
Recommend single-incision slings over conventional	No	Ic/A	No	
Cystoscopy for all MUS procedures	Yes	C	No	
Open=laparoscopic colposuspension	Yes	Ia	No	
Recommend open NOT laparoscopic routinely	No	Ia/A	Yes	I
AFS better than colposuspension for SUI	Yes	Ib	No	
If AFS must be able to CISC	Yes	Ib/C	No	
Colposuspension (open or laparoscopic) or AFS second line to MUS	Yes	A	No	
Bulking agent short-term improvement in SUI only	Yes	2a/A	Yes	3
Do not offer to women seeking cure for SUI	Yes	2a/A	Yes	3

EAU: European Association of Urology; NICE: National Institute for Health and Care Excellence; MUS: mid-urethral slings; AFS: autologous fascial slings; RP: retropubic; SUI: stress urinary incontinence.

adverse events when compared with 'outside-in' and efficacy is similar.[41] NICE echo the use of the 'bottom-up' technique for retropubic tapes but do not differentiate between either transobturator approach.

Furthermore, neither organisation recommends the use of single-incision slings. Whilst the single-incision operation is quicker and has fewer peri-operative adverse events, there remains no evidence of any benefit over the more conventional approaches.[42] This may be a reflection of inter-operative variability for a relatively new procedure or the variability in the slings themselves. In addition, the material used for a synthetic MUS remains a constantly evolving debate. Current NICE guidelines recommend using the well-established type 1 macroporous polypropylene tape. This should be coloured to aid both primary insertion and the revision surgeon. The EAU do not make any recommendations regarding tape material or colour.

Finally, the EAU recommend a cystoscopy on all women having an MUS inserted.

Bulking agents. Both guidelines recommend that bulking agents can be used for short-term management of SUI if conservative management has failed. The evidence suggests they are less effective than colposuspension or AFS but have significantly fewer adverse effects. However, there is a range of patient satisfaction reports compared to more invasive options that suggest both lower[43] and higher[44] levels of satisfaction. The EAU highlight that bulking agents should not be offered if a permanent cure is required and both guideline panels emphasise that multiple injections will be required. There is no consensus on the best route of injection, i.e. transurethral or transperineal, although as both guidelines highlight a transperineal approach may increase the risk of urinary retention.[43,45]

Complex SUI procedures

This is generally defined as patients who have had previous unsuccessful SUI surgery, concomitant POP, or radiotherapy to the pelvis/perineum. NICE guidelines recommend referral to a tertiary service that has a case load of at least 20 complex SUI patients per year for further investigation and management. The EAU also recommend tertiary referral and further detailed patient evaluation (Table 10). There is insufficient evidence to identify exactly what secondary procedures should be performed. As a result, neither guideline provides a clear treatment algorithm. Decisions are best assessed on a case-by-case basis. The EAU suggests AFS is better than colposuspension if the patient has had more than two previous surgeries.[46]

Artificial urinary sphincter (AUS). Because of the high risk of adverse events, both panels recommend AUS to be used

Table 10. Complex SUI treatment recommendations.

Recommendation	EAU	Level	NICE	Level	Comment
Refer to a tertiary centre	Yes	A	Yes		
Base surgery on evaluation of patient and their UDS	Yes	C	Yes		
SUI secondary surgery less effective than primary surgery	Yes	2/C	Yes		
No evidence for superiority of one surgical technique for recurrent SUI	Yes	3	Yes		
AFS before open colposuspension if >2 previous SUI surgeries	Yes	2	No		
AUS last-line SUI therapy	Yes	3/C	Yes		
Concomitant SUI and POP surgery OK	Yes	1a/A			No NICE comment
Combined POP and SUI surgery increases risks	Yes	1b/A			No NICE comment
Benefit of prophylactic SUI surgery during POP surgery uncertain	Yes	1b/C			No NICE comment
Counsel increased risk of SUI after POP surgery	Yes	1a/A			No NICE comment

EAU: European Association of Urology; NICE: National Institute for Health and Care Excellence; UDS: urodynamics; SUI: stress urinary incontinence; AFS: autologous fascial slings; POP: pelvic organ prolapse.

only as a final option if previous surgery has failed. NICE recommend that patients undergoing AUS implantation should have lifelong follow-up.

POP. This is discussed only by the EAU. They recommend offering simultaneous surgery for POP and SUI, but that combined surgery has an increased risk of adverse events. For patients with POP but no SUI, patients should be counselled that there is an increased risk of developing UI postoperatively. Moreover, any benefits from prophylactic incontinence surgery at the same time as the primary POP procedure remain uncertain.

Urethral diverticulum. This is covered only by the EAU. They recommend excision if the patient is symptomatic.

Surgical competence

The NICE guidelines finish with a section on the appropriate training and standards expected of surgeons performing incontinence procedures. Apart from the generic transferable skills generally expected of a fully trained and competent surgeon, NICE suggest that a surgeon should be performing a minimum of 20 cases of each primary incontinence operation per year. There is no real evidence upon which to base this recommendation. They also say that if performing fewer than five cases/year clear local governance policies should be in place; otherwise, patients should be referred to a larger volume centre – suggesting it is acceptable for a surgeon performing < 5 cases per year to continue, providing they audit their data and are subject to regular clinical governance review. It is unclear what should be happening to patients whose surgeons perform 5–19 cases per year but we assume a similar situation to those performing fewer than five cases per year. The EAU guidance follows the NICE criteria for the description of a competent surgeon but does not put a number on the volume of cases that should be completed.

Conclusions

Both the NICE and EAU guidelines offer a useful framework for UK clinicians providing treatment for UI in women. There is high-level evidence supporting the use of PFMT, pharmacological therapies and the key primary surgical interventions for both UUI and SUI. In contrast, both guidelines rely on lower level evidence and expert consensus to recommend investigations, lifestyle changes and more complex surgeries.

The key differences identified between the two guidelines regarding diagnosis are, first, pad testing in the initial work-up of UI is recommended by the EAU but NICE instead suggests using it only to assess treatment response. Second, NICE endorse the use of urodynamics in all who have failed initial SUI surgery and video and/or ambulatory urodynamics if the diagnosis remains unclear. The EAU does not give such strict criteria for performing urodynamic studies.

In terms of non-surgical management, the EAU recommend the use of biofeedback with PFMT; NICE do not. The EAU also suggest the use of duloxetine as a second-line agent in the management of UI. Conversely, NICE recommend its use only if surgery is not an option and further pharmacological therapies are required. The two

guidelines disagree on the use of desmopressin – the EAU for short-term daytime use, NICE for short-term use to improve nocturia.

Before starting invasive surgical management NICE provide specific guidance on the use of an MDT to plan all interventions. The EAU do not provide clear guidance on this. With regards to surgical interventions, the EAU recommend starting botulinum toxin A therapy at 100 units compared with NICE at 200 units. The EAU clearly state a mid-urethral tape is first-line surgical management for primary SUI, whereas NICE also recommend that open colposuspension or autologous rectus fascial sling can be used. Finally, the EAU recommend a cystoscopy as part of every MUS procedure; NICE do not have this specific recommendation.

Whilst there are considerable similarities amongst the two guidelines, the variation between them highlights the importance of using them as an aid to decision making rather than as a fixed treatment algorithm.

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