



European Association of Urology



EAU Recommendation

The Role of Urodynamics in the Evaluation of Urinary Incontinence: The European Association of Urology Recommendations in 2016

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Urodynamic studies are defined simply as a *functional study of the lower urinary tract, usually comprising free uroflowmetry, postvoid residual (PVR) measurement, filling and voiding cystometry* [1,2]. The role and utility of urodynamics as a diagnostic and prognostic tool for patients with urinary incontinence, and lower urinary tract symptoms in general, is a topic of on-going debate in functional urology forums across the globe. The purpose of this article is to clarify and reiterate the position of the European Association of Urology (EAU) guideline office on the matter as it currently stands. We also review some of the evidence on which these recommendations are based, as well as some of the controversies in the interpretation of this evidence.

The overall recommendations from the guidelines regarding the use of urodynamics in the evaluation of incontinence can be simply summarised as follows:

- **A good history and clinical evaluation should be all that are required to help decide the best treatment for uncomplicated urinary incontinence.**
- **Urodynamics may help if there is uncertainty about the best form of invasive treatment to pursue.**
- **Always perform urodynamics to the highest possible quality standards for the results to be valid and useful.**

To arrive at these conclusions, the guideline panel conducted a thorough and systematic evaluation of the available evidence. The EAU guidelines are unique in that the searches are updated annually and therefore there is an

annual appraisal of the evidence to identify any new important research that may influence or change the recommendations. Consequently, it provides readers with the most up-to-date evaluation of the evidence relating to urology.

These are not the only international guidelines pertaining to urodynamics, however. For comparison, we examine the statements and recommendations, in full, of various guideline groups regarding the role of urodynamics in the management of urinary incontinence (UI), as shown in [Table 1](#).

Two things are apparent from these recommendations. First, the assigned evidence grades (where stated) appear to be low to moderate. Second, it is important not to confuse recommendations for stress UI (SUI) with urgency UI or UI in general.

Grades of recommendation tend to be based on the level of evidence available when reviewing a topic. Urodynamic studies have not been extensively evaluated in randomised control trials, for reasons we can only speculate about. However, a relatively recent trial has been conducted by the Urinary Incontinence Treatment Network in the USA. Aptly named the VALUE study [6], its aim was to assess the value of urodynamic evaluation in a multicentre, randomised, noninferiority design comparing the results of office evaluation alone to office evaluation plus urodynamics among women for whom surgery was planned for stress-predominant UI. The primary outcome was a reduction of more than 70% in the Urogenital Distress Inventory score, and a response of “much better” or “very much better” for

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Table 1 – Recommendations by international guideline groups on the role of urodynamics in the management of urinary incontinence**European Association of Urology urinary incontinence guideline recommendations [5]**

Clinicians carrying out urodynamics in patients with urinary incontinence should:

- Ensure that the test replicates the patient's symptoms
- Interpret results in the context of the clinical problem
- Check recordings for quality control
- Remember there may be physiological variability within the same individual (grade C)

Advise patients that the results of urodynamics may be useful in discussing treatment options, although there is limited evidence that performing urodynamics will predict the outcome of treatment for uncomplicated urinary incontinence (grade C)

Do not routinely carry out urodynamics when offering treatment for uncomplicated urinary incontinence (grade B)

Perform urodynamics if the findings may change the choice of invasive treatment (grade B)

National Institute for Health and Care Excellence (2015) [4]

Do not perform multichannel cystometry, ambulatory urodynamics or videourodynamics before starting conservative management (2006, amended 2013)

After undertaking a detailed clinical history and examination, perform multichannel filling and voiding cystometry before surgery in women who have:

- Symptoms of OAB leading to a clinical suspicion of detrusor overactivity, or
- Symptoms suggestive of voiding dysfunction or anterior compartment prolapse, or
- Had previous surgery for stress incontinence (2006, amended 2013)

Do not perform multichannel filling and voiding cystometry in the small group of women where pure SUI is diagnosed based on a detailed clinical history and examination (2006, amended 2013)

Consider ambulatory urodynamics or videourodynamics if the diagnosis is unclear after conventional urodynamics (2006, amended 2013)

Society of Urodynamics, Female Pelvic Medicine and Urogenital Reconstruction/American Urological Association (2012) [3]

"Clinicians may perform multi-channel urodynamics in patients with both symptoms and physical findings of stress incontinence who are considering invasive, potentially morbid or irreversible treatments" (option; evidence strength: grade C)

"Clinicians should perform repeat stress testing with the urethral catheter removed in patients suspected of having SUI who do not demonstrate this finding with the catheter in place during urodynamic testing" (recommendation; evidence strength: grade C)

OAB = overactive bladder; SUI = stress urinary incontinence

the Patient Global Impression of Improvement at 12 mo. Some 630 women were enrolled in the study, with 538 included in the final intention-to-treat analysis. The result was 76.9% treatment success in the urodynamic testing group versus 77.2% in the office evaluation-only group, consistent with noninferiority. Interestingly, the study did show that women undergoing urodynamics were less likely to receive a diagnosis of overactive bladder (25% vs 41%) and more likely to be diagnosed with voiding phase dysfunction (11.9% vs 2.2%), but this did not lead to any significant differences in treatment selection or outcomes. The principal finding of this, and some of the secondary analyses, was that while the diagnosis may have changed after urodynamics, it was uncommon for the surgical procedure to be altered. In addition, regardless of any change in diagnosis or surgical plan, the outcome was not affected by performing urodynamics in this select group of patients. Importantly, this study was based on a very select group of women with SUI unlikely to suffer postoperative complications.

A similar European study [7] randomised 109 women for whom urodynamics results were discordant with clinical assessment to either immediate surgery or individually tailored therapy based on urodynamics. They concluded that immediate surgery, irrespective of the result of urodynamic studies, did not result in inferior outcomes.

This brings us to the conundrum of the true utility of urodynamics in investigating patients' UI. Most practitioners accept the evidence that there is poor same-session repeatability [8] and even interoperator repeatability for urodynamics. Furthermore, if we accept the available evidence that urodynamic studies do not influence the outcomes of conservative or drug management for any type of UI or outcomes after surgery for uncomplicated SUI [5,9],

then it becomes essential to ask whether there is a role for urodynamics as a preliminary investigation in patients with UI.

The answer, as is so often the case in functional urology, is not a straightforward one. The EAU guideline panel has taken a pragmatic approach and states that urodynamics, when used, should always be performed to a standard adhering to ICS guidelines with good quality control, always aim to replicate the patient's symptoms and always be interpreted based on the individual clinical context. We further state that it should not be used routinely before offering treatment for uncomplicated UI, but may be performed if the findings may change the choice of invasive treatment. This leaves the decision very much in the hands of the consulting clinician, and this is quite deliberate. The aim of the guideline is to provide the clinician with an appraisal of the available evidence that is aimed to help them make the most appropriate decision for the individual patient.

As discussed in the section devoted to treatment of the patient with complicated incontinence, there are certain clinical scenarios where urodynamics can clearly provide unique and valuable information that cannot be easily obtained elsewhere. Patients who have had prior surgical treatments and have persistent or worsening incontinence, or patients with mixed incontinence who have not responded to conservative and medical management are two good examples for which urodynamic evaluation may help in guiding management. Other examples are noted in Figure 1.

In summary, there is currently quality evidence demonstrating that in a patient with straightforward stress incontinence (no significant postvoid residual, no prior lower urinary tract surgeries, either pure SUI or stress-

Complicated urinary incontinence

- UI associated with genitourinary prolapse
- Mixed UI (equally bothersome stress and urgency UI)
- Previous surgery for UI
- Neurogenic bladder dysfunction
- UI associated with known structural abnormality of the urinary tract
- Continuous UI (suspected fistula or urethral diverticulum)

Fig. 1 – What is meant by *complicated urinary incontinence*. Repeated reference is made in the text to uncomplicated urinary incontinence (UI), so it is useful to clarify what is meant by complicated UI, and by extension the type of cases for which urodynamics may be of significant benefit.

predominant mixed UI, and no high-grade prolapse), performing urodynamics does not improve surgical outcome. However, currently there is no better test to evaluate bladder function than urodynamic or videourdynamic testing, and in patients with complicated UI and those who do not respond to first-line therapies, urodynamics may provide valuable information that can guide management and improve both patient and physician confidence in prescribed therapies.

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