










The Urogynecology Section of the Polish Society of Gynecologists and Obstetricians Guideline for the diagnostic assessment of stress urinary incontinence in women

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ABSTRACT

Objectives: The aim of the Urogynecology Section of the Polish Society of Gynecologists and Obstetricians (PSGO) was to develop an updated Guideline for the diagnostic assessment of stress urinary incontinence (SUI) in women.

Material and methods: Earlier PSGO guidelines and the literature about the diagnostic assessment of SUI, including current international guidelines, were reviewed.

Results: As in the earlier guidelines, the diagnostic process was subdivided into the initial and the specialized diagnostics. Patients who required specialized diagnostic testing were identified. Functional diagnostic tests, performed by physiotherapists, were included. Attention was paid to new diagnostic possibilities.

Conclusions: Initial diagnostic assessment is sufficient to devise the optimal treatment plan in a number of patients. It also allows to identify which patients will require specialized diagnostics, whose scope is individually tailored to the patient needs and depends on symptom complexity, surgical history, treatment plan, experience of the physician, availability of the equipment, and cost-effectiveness ratio.

Key words: stress urinary incontinence; SUI diagnostics; urodynamic testing; pelvic floor ultrasound; cough test; pad-test

Ginekologia Polska 2023; 94, 4: 330–336

INTRODUCTION

This Guideline is meant to be a reference tool for diagnostic management for specialists as well as residents from

various fields. In justified cases, after detailed analysis of a given clinical situation, the recommended course of action

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Received: 15.08.2021 Accepted: 18.09.2021 Early publication date: 18.02.2022

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for the diagnostic process may be modified, which in turn might aid future modification and update of the Guideline.

The International Continence Society (ICS) defines urinary incontinence (UI) as involuntary loss of urine. It constitutes a hygienic problem and may hamper the social life of the affected individuals. Isolated episodes of urinary incontinence are not perceived as a disease, on condition they are not bothersome. Stress urinary incontinence (SUI) is defined by ICS as involuntary leakage of urine on effort or exertion (e.g., sports activities), during sneezing or coughing. In extreme cases, urine loss may be triggered by sudden changes in body position. SUI needs to be differentiated from overactive bladder (OAB), overflow incontinence, and non-sphincter related UI [1–5].

Proper diagnosis of UI type and the underlying cause allows to implement adequate treatment. A number of diagnostic methods for SUI, with different degrees of invasiveness, accuracy, and objectivity as well as cost, are currently available [2, 6–8].

Objectives

The aim of the Team appointed by the Board of the Urogynecology Section of the Polish Society of Gynecologists and Obstetricians (PSGO) was to develop this Guideline, using reliable literature sources, expert knowledge and opinion, as well as everyday practice.

MATERIAL AND METHODS

A review of the literature (2010–2020), earlier recommendations of PSGO (2005–2010), and current guidelines of the American Urological Association, European Association of Urology, Canadian Urological Association and Interdisciplinary S2K Guideline: Sonography in Urogynecology, devised by specialists from Germany, Switzerland, and Austria, were used to create this Guideline. Expert opinions on the use of various tests in clinical practice were analyzed.

Guideline for SUI diagnostic assessment

In accordance with the 2005 PSGO guidelines, the diagnostic process for SUI is subdivided into the initial and specialized diagnostic assessment. Information about functional diagnostics, typically performed by a physiotherapist, was also included. Importantly, it is recommended that a patient has a full bladder for UI diagnostic assessment but an empty bladder and, if feasible, an empty rectum, for pelvic organ prolapse (POP) assessment [2, 8, 9].

I. Initial diagnostics

On first visit, all patients with symptoms of UI undergo the initial diagnostic procedures. Their goal at this stage is to make a preliminary diagnosis, which allows to establish the first-line therapy, or to identify those patients who require

specialized management. Specialized diagnostic evaluation is usually recommended to patients with recurrent UI, history of urogynecologic surgeries, UI associated with pain, hematuria, recurrent infections, micturition disorders, or after radiation therapy within the area of the lesser pelvis. Some patients with unsuccessful outcome of the first-line therapy also require specialized diagnostic assessment [2, 8, 10–12].

1. Medical history.

Medical history should include gynecologic, urogynecologic, obstetric and general medical history, which helps to identify the possible causes and symptoms of SUI. It is important to recognize which complaints have the most negative effect on the quality of life and sexual function of the patient.

2. Diagnostics of the urinary tract infections.

3. Clinical evaluation.

The cough test and the assessment of urethral mobility are important components of the clinical evaluation.

4. Post-void residual.

5. Pessary test.

6. Gynecological ultrasound.

7. Pelvic floor ultrasound.

8. Micturition diary.

After the initial diagnostic process has been completed, the patient should receive information about the possibilities of non-surgical treatment. If the conservative management is not accepted by the patient or proves to be ineffective, surgical management may be recommended. Data from the initial diagnostic tests may be enough to plan a surgery for women with uncomplicated SUI, without advanced pelvic organ prolapse (POP). Sometimes the range of the diagnostic tests is broadened in those women. Certain additional tests, components of the specialized diagnostics, are usually recommended for patients with complicated SUI and significant POP [10, 13–15]. The terms of uncomplicated and complicated SUI and specialized diagnostics have also been presented in the Urogynecology Section of PSGO Guideline for the use of urodynamic testing in gynecologic practice and the PSGO Guideline for the diagnostic assessment of pelvic organ prolapse.

II. Specialized diagnostics

It is recommended that the scope of specialized diagnostic testing for SUI is individually adjusted to the patient needs by the specialist. The choice of methods depends on patient-reported symptoms, initial diagnostic findings, surgical history, management plan, availability of the equipment, and cost.

Certain tests performed during the initial diagnostic assessment may be repeated during the specialized evaluation. The specialized diagnostic tests for SUI may include any of the following:

- urodynamic testing,
- urethrocystoscopy,
- abdominal ultrasound,
- X-ray,
- magnetic resonance imaging (MRI),
- computed tomography (CT),
- consultation or multidisciplinary team consultation.

The range of specialized diagnostic tests is tailored to the individual needs of the patient. It depends on disease complexity, surgical history, management plan, the experience of the physician, availability of the equipment, and cost-effectiveness ratio. In certain cases, some of the tests performed during the initial diagnostic assessment may be repeated during specialized evaluation.

III. Functional diagnostics before the start of pelvic floor muscle training in women with SUI symptoms

Patients with symptoms of SUI also need to undergo testing before physiotherapy is initiated. The most common tests performed before physiotherapy include:

1. medical interview,
2. micturition diary,
3. sacral dermatome evaluation, neurological evaluation of the perineal and lower extremity sensory and motor function,
4. palpation of the abdomen to detect irregularities, *e.g.*, tender areas,
5. evaluation of the pelvic floor muscle structure, muscle trophic factor and tender areas on palpation in resting position,
6. analysis of pelvic floor muscle function muscle during contraction, cough and Valsalva in clinical examination, as well as pelvic floor ultrasound,
7. assessment of levator ani function,
8. cough test with adequately filled bladder (app. 200–400 ml),
9. post-void residual [16–27].

The choice depends on patient symptoms, experience of the specialist who conducts the physiotherapy, and the availability of the equipment.

If it is not possible to plan the process of physiotherapy for a woman with SUI during a physiotherapy appointment, it is advisable to consult other specialists.

Details about the course of physiotherapy have been discussed elsewhere, in a separate PSGO Guideline.

Guideline review

I. Initial diagnostics

1. Medical history

Despite the lack of sufficient data in the literature, medical history provides the basis on which optimal diagnostic assessment for women with symptoms of SUI is developed

(LE4). Detailed medical data ought to be collected, including reasons for seeking medical help, dominant symptoms, and how they affect the quality of life and sexual function of the patient. During the interview, it is also essential to identify patient expectations about the therapy outcome and which diagnostic tests need to be performed. The aim of data collection is to distinguish between different types of UI, symptom duration, and their intensity. Obstetric history and data about gynecologic and urogynecologic surgeries need to be correlated with the onset of SUI symptoms. Menstruating women ought to be asked whether the symptoms appear or intensify in the second phase of the cycle. Data about medication and fluid intake, especially drinks including caffeine, theine, and alcohol, should be obtained. Recurrent urinary tract infections and constipation also can affect SUI intensity. Additionally, questions about physical activity and smoking should also be included [2, 9, 11, 12].

Information about the use of absorbent materials (pads) may also be useful to determine the intensity of SUI [28, 29].

Data collection may be facilitated using either forms, which are completed by the medical personnel, or patient-completed surveys. Standardized questionnaires, after validation in a given language, are used for research. They may be applicable when differentiating between various types of UI, but there is no proof that their use in everyday practice improves the effects of SUI therapy (LE3). It is vital to establish the impact of SUI on the quality of patient life. The Visual Analogue Scale (VAS) allows the patient to rate the quality of their life and symptom bother on a scale from 0 to 10, with 0 for 'not at all bothersome' and 10 for 'extremely bothersome'. The patient may also mark the answer using a 10-centimeter ruler instead of using a verbal entry. Some specialists use standardized questionnaires, validated in a given language [2, 30–32].

During the medical interview it is advisable to discuss the effects of SUI on sexual functioning as well as the number of episodes and UI intensity during sexual activity (coital urinary incontinence). Pain during intercourse is also an important finding and patient-completed questionnaires may prove to be useful in such cases [33–35].

2. Diagnostics for urinary tract infection

Apart from urine test and culture, diagnostic tests for signs of infection in the urethra, vagina and cervix are sometimes recommended as well. Urine test is performed to detect, first and foremost, infections in the urinary tract, hematuria, and glycosuria (LE2). In women > 65 years of age, asymptomatic bacteriuria is not a cause of SUI and does not need to be treated [2, 36].

3. Clinical evaluation

Standard gynecologic and abdominal examination, with the evaluation of vaginal estrogenization in peri- and post-menopausal women (*e.g.*, signs of vulvar and vaginal

atrophy (VVA), evaluation of vaginal pH) ought to be performed, for example using the Vaginal Health Index (VHI). Attention should be paid to the external genital organs, the urethral and the rectal area, as well as the vagina. It is important to look for adhesions in the vagina, other defects, and abnormally sensitive (tension and pain) areas during the examination. Neurological test may include the evaluation of posture, gait, and motor coordination. In most patients, the bulbospongiosus reflex does not need to be checked during the gynecologic exam in everyday urogynecologic practice [9, 11, 12, 37].

Patient ability to perform pelvic floor muscle training (PFMT) may be assessed on palpation, using a 6-point Oxford scale. According to the literature, Resting Tone test (RT test) test on palpation with the use of a 6-point scale has satisfactory repeatability. Both scales have been discussed in the PSGO Guideline for the diagnostic assessment of POP. In some women, palpation is performed during the rectal exam, as it allows to evaluate the resting tone and contractibility of the anal sphincter muscle [2, 15, 38, 39].

The diagnostic assessment of the pelvic organ prolapse has been discussed elsewhere, in a separate PSGO Guideline. The POP-Q scale, or a simplified POP-Q scale, are commonly used [40, 41].

The cough test is the most common diagnostic test to confirm SUI and it is used in clinical practice as well as research. Recently, the ICS has standardized the cough test and introduced the ICS Uniform Cough Test (ICS-UCST) (LE2) [16]. First, the patient is informed about the aim of the test and reassured about the incontinence episode during the test to alleviate the feeling of discomfort and embarrassment. The cough test is typically performed in a gynecology examination chair and repeated standing, if the first test was negative. The bladder should be filled (200–400 mL), with the volume depending on the comfort of the patient — it is important to ensure that there is neither too little nor too much urine. It is possible to perform the test on a naturally filled bladder or use a catheter to fill it. The patient is instructed to forcefully cough three consecutive times in quick succession. If no urine is passed, the maneuver is repeated three times. If the test is negative in a lithotomy position, it is repeated standing. If the urine leakage occurs sometime after the coughing or continues afterwards, it is suggestive of bladder overactivity.

Urethral mobility may be assessed during cough or Valsalva in clinical evaluation. Some specialists perform the Q-Tip Test for a more objective evaluation although other authors question its usefulness [42, 43]. Pelvic floor ultrasound transabdominal probe (PFU-TA) and pelvic floor sonography transvaginal probe (PFS-TV) allow to evaluate urethral mobility, with good repeatability and reproducibility. During PFS-TV, urethral prolapse is evaluated using the mobility vector of the bladder neck. A vector of 5 mm

has been defined as hypomobility (urethra with diminished mobility), between 5 mm < and < 15 mm as normal mobility, and ≥ 15 mm as hypermobility. A correlation between vector values and the effectiveness of SUI repair using a suburethral sling has been confirmed. Evaluation of urethral mobility may be useful when planning to implant the suburethral sling in individual cases. For the PFU-TA imaging, a method to assess the mobility of different segments of the urethra has been devised [15, 44–47].

A pad-test is used to assess the volume of urine loss due to urinary leakage. It may confirm UI but cannot be used for differential diagnosis. The duration of the test varies, it may be long- or a short-term, but the one-hour pad-test is typically performed. The pad-test is recommended for research and for certain cases in everyday practice (LE3) [2, 48].

4. Post-void residual

Post-void residual (PVR) refers to the volume of urine which remains in the bladder after a typical micturition. The volume is measured during catheterization or using ultrasound imaging. In case of doubt, it is advisable to repeat the test several times. It may be performed in patients who presented for the test with overfull bladder (> 350–400 mL of urine). There are no PVR norms, however a PVR volume of 50–100 mL is believed to be normal in typical cases [2]. The PVR test for POP patients has been discussed elsewhere, in the PSGO Guideline for POP.

5. Pessary test

A pessary test is commonly used in POP patients, which has been discussed elsewhere, in the PSGO Guideline for POP diagnostic assessment.

6. Gynecologic ultrasound

The use of this modality is recommended if the patient presents with symptoms of gynecologic disorders. Often, it is performed as a supplementary test to a gynecologic exam [7].

7. Pelvic floor ultrasound

A growing number of specialists use pelvic floor ultrasound in everyday practice and for research. According to the literature, ultrasound is useful to confirm SUI, to plan surgical intervention in patients with symptomatic SUI, and for the diagnostic assessment after urogynecologic surgery. However, the amount of data is insufficient to develop a guideline for the use of pelvic floor ultrasound in SUI patients. A significant number of experts believe that the test is an element of a specialized diagnostic process, while in some centers it is treated as a standard component of the initial diagnostic assessment [15, 44–46].

The literature offers more reports about the use of PFS-TV as compared to PFU-TA to diagnose patients with SUI. Studies have shown applicability of the evaluation of the internal urethral orifice, during resting and straining, to diagnose SUI and intrinsic sphincter deficiency (ISD). Apart from

urethral mobility, it is possible to measure its length. Urethral mobility and length vary significantly among women, which may negatively affect the effectiveness of SUI repair using a mid-urethral sling (MUS). On the other hand, using PFS-TV to plan MUS implantation in individual patients may have a positive effect on the outcome of SUI therapy. The MUS is composed of polypropylene, which is easily visualized on ultrasound. PFS-TV is a real-time test, performed with the use of a transvaginal probe in 2D imaging. The advantages include minimal contact surface between the probe and the assessed area, easily obtained optimal angle of the ultrasound beam, and high frequency of the ultrasound, which provides superior-quality real-time images of the lower segment of the urinary tract. A 2D ultrasound allows for a real-time evaluation of the urethral area and the sling in three planes: frontal, sagittal, and axial, allowing to determine 4 parameters of tape location. The following three parameters are assessed in the sagittal plane:

- tape position in relation to the urethral length,
- the distance between the sling and the echolucent part of the urethra,
- the shape of the sling.

In the axial plane, the symmetry of the tape around the urethra is evaluated [44, 47, 49–53].

In some centers, PFS-TV is routinely performed in patients after surgical repair due to SUI and POP, as it allows to objectively assess the location of the mesh and the tape. Pelvic floor ultrasound helps to identify the cause for complaints after the procedure and to plan optimal management, conservative or surgical, shortly after the surgery and in the long term follow-up. Studies suggest it would be possible to use PFS-TV to diagnose MUS displacement. For example, the ultrasound test may be useful in patients after suburethral sling placement if the location of MUS is optimal in relation to the bladder neck length, but too close to the urethra — the distance between the tape and the echolucent area of the urethra on PFS-TV is < 3 mm. Early detection of such cases allows to loosen the tape [7, 54–57].

8. Micturition diary

The patient records all micturitions per 24 hours, including urine volume, episodes of incontinence or urgency, liquid intake, the number of used pads. All this information is useful when establishing patient micturition behavior. Also, a micturition diary allows to evaluate the effects of the therapy (LE2). Regardless, a diary is a supplementary test and should not constitute the basis for the diagnosis. Data do not always correlate with the level of symptom intensity of UI. Some patients might find it challenging to keep the diary. At present, micturition diaries are available in both, paper and electronic formats (e.g., applications for smartphones). The diary should be kept for three days, which is enough time to obtain reliable measurements. In certain cases, the

patient is advised to keep the diary for 24 hours. Some specialists recommend recording entries in the diary for seven days. A micturition diary may be routinely used in all patients or only in those with atypical symptoms [58].

II. Specialized diagnostics

The following tests:

- medical history,
 - diagnostic assessment of urinary tract infections,
 - clinical examination with cough test and assessment of urethral mobility,
 - post-void residual,
 - pessary test,
 - gynecologic ultrasound,
 - pelvic floor ultrasound,
- are used, both in the initial and specialized diagnostic assessment.

Additionally, specialized diagnostics may also include the following tests:

1. Urodynamic testing

The use of this test for SUI diagnostics has been discussed elsewhere, in the PSGO Guideline about the use of urodynamic testing in gynecologic practice.

2. Urethrocystoscopy

Urethrocystoscopy is not recommended for the diagnostic assessment of uncomplicated SUI. Bladder disorders are detected in approximately 2% of symptomatic patients with UI, therefore urethrocystoscopy is not a useful screening test. Urethrocystoscopy is typically performed after unsuccessful urogynecologic surgeries, especially in patients with hematuria, bladder or urethral pain, or suspected fistula, foreign body or tumor in the bladder, and sling or mesh displacement [59–62].

3. Abdominal ultrasound

In patients with SUI, the diagnostics of the urinary tract must strictly adhere to the guidelines in cases of suspected ectopic ureter or ureterovaginal fistula, when UI is associated with certain bladder disfunctions, if there is suspicion of hypotonic bladder, and other bladder disorders [7].

4. X-ray, MRI, CT

X-ray imaging in most cases has been replaced with ultrasound imaging, sometimes with additional MRI and CT. Cystourethrogram is performed only in special situations. Voiding cystourethrogram (VCUG) has also been replaced by ultrasound imaging [7].

MRI allows visualization of the entire pelvic structure, but the test is static. Magnetic resonance is not recommended in routine diagnostics of primary uncomplicated SUI, but it may be a valuable modality in the diagnostic assessment of complicated cases [63–64].

CT is recommended in exceptional circumstances, for example in patients with suspected renal tumor or those

with urinary tract fistula presenting with diagnostic obstacles [65].

5. Consultation or multidisciplinary team consultation

In complicated cases, especially after numerous surgical interventions, a consultation or a multidisciplinary team consultation may be recommended.

CONCLUSIONS

In many cases, the initial diagnostic assessment is sufficient to devise an optimal management plan. It also allows to identify those patients who will require specialized diagnostics. The scope of specialized diagnostic testing is individually tailored to the patient needs and depends on disease complexity, surgical history, management plan, experience of the physician, availability of the equipment, and cost-effectiveness ratio.

Conflict of interest

All authors declare no conflict of interest.

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