

# The Management of Female Urinary Incontinence

## Part 1: Aetiology and Investigations

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Urinary incontinence has been defined by the International Continence Society as the involuntary loss of urine that is objectively demonstrable and is a social and hygienic problem. Urinary incontinence increases with age and has significant effects on the physical, psychological and social wellbeing of women of all ages. It is associated with declining general health and cognitive function, affects at least 14% of women over 30 years of age, and as many as 50% of nursing home residents.

Incontinence has been described as the last taboo and, thus, the condition often remains 'silent' as a result of a combination of factors; sufferers are too embarrassed to tell anyone about their incontinence, may not know that it can be treated, or have the erroneous idea that 'it is normal.' Thus, women who present to their general practitioners and gynaecologists will often not report symptoms of urinary incontinence unless specifically questioned. There are many other types of female urinary dysfunction (see Table 1) any of which may simultaneously affect a woman suffering from incontinence, resulting in an exacerbation of her symptoms and making the management of her condition more difficult.

Table 1. Types of Female Urinary Dysfunction

<u>Urinary Incontinence</u>	<u>Other Types of Urinary Dysfunction</u>
Stress incontinence	Frequency
Urge incontinence	Nocturnal enuresis
Overflow incontinence	Urgency
	Poor flow
	Interrupted flow
	Retention
	Recurrent urinary tract infections
	Haematuria (macroscopic or microscopic)
	Postmicturition dribbling

Major causes of urinary incontinence include stress urinary incontinence, detrusor Overactivity, overflow incontinence, fistulae, urethral diverticulum, functional factors (immobility), temporary causes (UTI, faecal impaction, drugs) and congenital causes (epispadias, ectopic ureter). There are three groups of factors that predispose towards stress urinary incontinence (see Table 2); raised intra-abdominal pressure, damage to the pelvic floor and a scarred 'drainpipe' urethra.

Table 2. Factors That Predispose Towards Stress Urinary Incontinence

<u>Raised Intra-Abdominal Pressure</u>	<u>Damage to the Pelvic Floor</u>	<u>Scarred 'Drainpipe' Urethra</u>
Pregnancy	Childbirth	Vaginal surgery
Chronic bronchitis	Radical pelvic surgery	Surgery for stress urinary incontinence
Abdominal/Pelvic mass	(Menopause)	Urethral dilatation
Ascities		Recurrent urethritis
(Obesity)		Radiotherapy

The pathophysiology of detrusor overactivity is poorly understood and the underlying cause is rarely found. Women usually present with multiple symptoms such as urgency, urge incontinence, frequency and nocturia. These symptoms are not exclusive to a specific diagnosis as exemplified by the work of Cardozo and Stanton (1980) (See Table 3).

Table 3. Presenting Symptoms for Patients with Stress Urinary Incontinence (SUI) and Detrusor Overactivity (DO) (Cardozo and Stanton,1980)

<u>Symptom</u>	<u>Proportion with SUI (N = 100)</u>	<u>Proportion with DO (N = 100)</u>
Stress incontinence	89	49
Urge incontinence	53	38
Nocturnal enuresis	14	13
Frequency	28	56
Difficulty voiding	6	9
Prolapse	42	18

The framework for beginning to arrive at a diagnosis begins with a detailed history and examination. Within the history the clinician needs to elucidate features of neurological and congenital abnormalities, previous infections and surgery, past obstetric history together with an assessment of menstrual, sexual and bowel function. Specific symptoms relating to the storage and evacuation of the lower urinary tract should also be sought. This can best be achieved in the format of a questionnaire that goes through a list of potential symptoms, each of which the patient will need to give an answer to (see Table 4).

Table 4. Questionnaire to Identify Patient Symptoms

Stress incontinence	Nocturnal enuresis	Tendency to coughing
Urge incontinence	Dysuria	Wet at rest
Urgency	Dyspareunia	Unable to interrupt micturition
Postmicturition dribbling	Constipation	Pad usage
Slow voiding	Pelvic organ prolapse	Wet at rest
Incomplete voiding	Enuresis after school age	Rectal soiling

The physical examination has four components: general state, urological, gynaecological and neurological systems. When assessing the patient's general state, attention should be paid to the elasticity and thickness of the skin, body habitus, and evidence of abdominal tumours. The oestrogenic state of the vaginal wall mucosal, presence of site specific defects in the supports of the pelvic organs, bladder base prolapse and angulation of the

urethra on coughing or valsalva should all be noted during the urogynaecological examination. If stress incontinence can be clinically demonstrated this is an important finding the patient must be reassured that it is a necessary part of the clinical examination in order to reduce embarrassment. Finally, no examination is complete without perfunctory neurological examination including perineal sensation and reflexes, anal sphincter tone and control. If there are any positive findings a more thorough neurological examination needs to be performed.

## Urodynamic Investigations

Urodynamic investigations can be categorised as either simple or complex (see Table 5). Many of the complex investigations have not been ratified for routine clinical use and remain in the domain of research.

Table 5. Urodynamic Investigations

Simple	Complex	
	Clinical	Research
Midstream urine specimen (MC + S ± Cytology)	Ultrasound	Ambulatory cystometry
Urinary diary	Videocystourethrography	Electrophysiological studies
Pad test	Urethral pressure profilometry	Urethral electrical conductance
Uroflowmetry	Leak point pressure	Magnetic resonance imaging
Cystometry ('Urodynamics')	Intravenous urography	

Whilst UTI's are uncommon causes of incontinence, an MSSU is mandatory that all patients with lower urinary tract symptoms since infections can aggravate symptoms and invalidate the results of cystometry. In the absence of infection, the presence of persistent microscopic (or macroscopic) haematuria must be investigated.

A frequency/volume chart (urinary diary) can be used to record the patients' pattern of fluid intake and output as well as documenting episodes of urgency, leakage, precipitating events and the number of pads used. These diaries are only as valuable as the effort made to complete them, and, often, paucity of completion makes the exercise worthless.

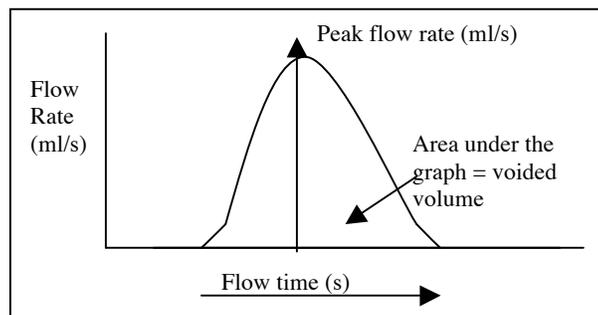
Pad tests are used not only in the research setting but also in the clinical scenario by continence physiotherapists. The International Continence Society describes a one hour pad test but this is rarely used by primary care doctors or specialists with an interest in urinary dysfunction.

The combination of cystometry and uroflowmetry form the test commonly referred to as 'urodynamic studies.' The test is performed in the outpatient setting and does not require any preparation on the part of the patient. In most circumstances the test can be completed within 30 minutes although the author gives each patient 60 minutes so as to allow time for pre-and post test discussions. Cystometry describes the pressure-volume relationship of the bladder. Electronic subtraction of abdominal from intravesical

pressures, which are simultaneously recorded during bladder filling ( $\pm$  emptying), enables determination of the detrusor pressure. The flow rate is the simplest and often the most useful investigation of voiding dysfunction. It is non-invasive, allows for objective confirmation of bladder outlet obstruction and helps identify patients who are at higher risk of obstruction following incontinence surgery. Nomograms from the flow rates of normal women suggest that a flow rate  $< 15\text{ml/s}$  on more than one occasion is considered abnormal in women. (The voided volume needs to be greater than  $150\text{ml}$  as flow rates with smaller volumes are unreliable.)

The parameters of normal bladder function are said to be a residual volume of less than  $50\text{ml}$ , the first desire to void occurring between  $150$  and  $200\text{ml}$ , a bladder capacity between  $400$  and  $600\text{ml}$ , the absence of any rise in detrusor pressure during filling and standing and no leakage on coughing.

Figure 1. Uroflowmetry graph showing a normal flow pattern



Videocystourethrography (VCU) has been described as the gold standard for assessment of urinary dysfunction but there are only a few situations where it provides more information than cystometry. During filling a vesicoureteric reflux can be seen, on coughing, bladder neck and base descent and leakage of contrast can be evaluated and during voiding, trabeculation and bladder urethral diverticula can be noted. VCU is of particular value in patients who have, or are suspected of having a neurological lesion.

The most valuable clinical role of ultrasound assessment of the lower urinary tract is making an estimation of post-micturition residual volume. A transperineal approach allows for bladder neck assessment and a transvaginal or suprapubic approach can be used to localize the site if periurethral injections for stress urinary incontinence.

Cystourethroscopy can either be carried out in the outpatient setting using a flexible cystoscope or under sedation in theatre using a rigid cystoscope. Direct visualization of the bladder and urethra allows the presence of disease to be excluded. Indications for Cystoscopy include (but are not limited to) persistent UTI, haematuria or abnormal cytology and a history of urgency or frequency.

## **Summary**

Sophisticated tests of urinary dysfunction are no substitute for the very simple questions that can indicate whether a patient suffers from urinary incontinence. In the practice of the author an average of 10 years elapses before a woman suffering from urinary incontinence seeks help from her general practitioner. The reasons are complex and include embarrassment, the mistaken belief that it is a natural consequence of getting older, or that there is no treatment available.

There exist a host of therapies aimed at curing or improving symptoms and signs of urinary incontinence. These will be covered in the second part of this article.