

# Urinary Incontinence

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European  
Association  
of Urology

# Nerve supply

## Autonomic

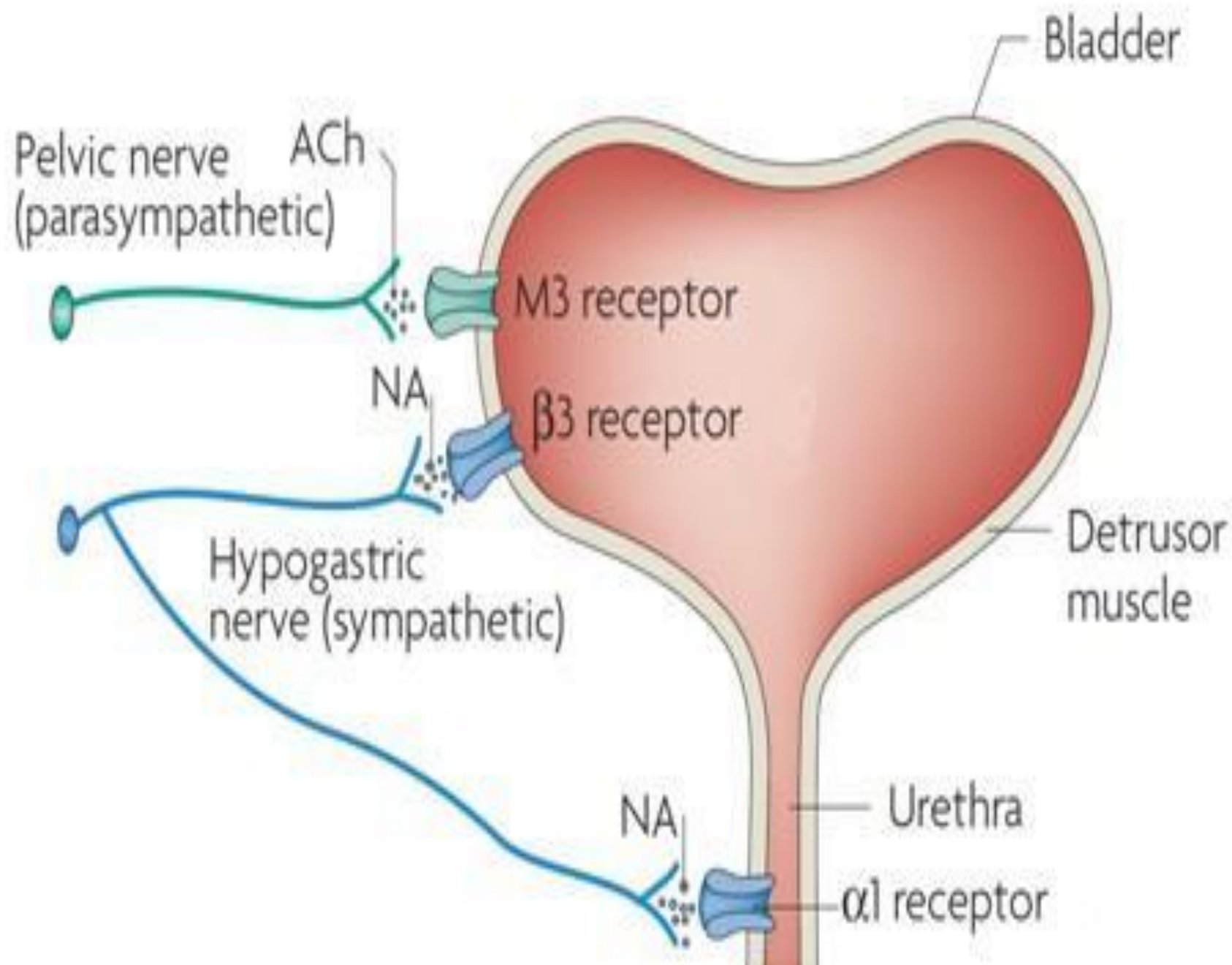
Sympathetic:  
continence

Parasympathetic:  
micturition

## Somatic

Voluntary  
prevention of  
micturition by  
striated muscles of  
external sphincter  
and pelvic floor





Nervous System	Nerve	Root	Receptor	Site of Action	Action	Result
Sympathetic	Hypogastric Nerve	T10-L2	<u>Adrenergic</u> B-Receptors	Bladder (detrusor)	Relaxation	Continence
			<u>Adrenergic</u> a-Receptors	Bladder Neck and Internal Urethral Sphincter	Contraction	Continence
Parasympathetic	Pelvic Nerve	S2-S4	<u>Cholinergic</u> Muscarinic Receptors (M2 and M3)	Bladder (detrusor)	Contraction	Voiding
Somatic	Pudendal Nerve	S2-S4		External Urethral Sphincter	Contraction	Continence



## Cytometric volume measurements

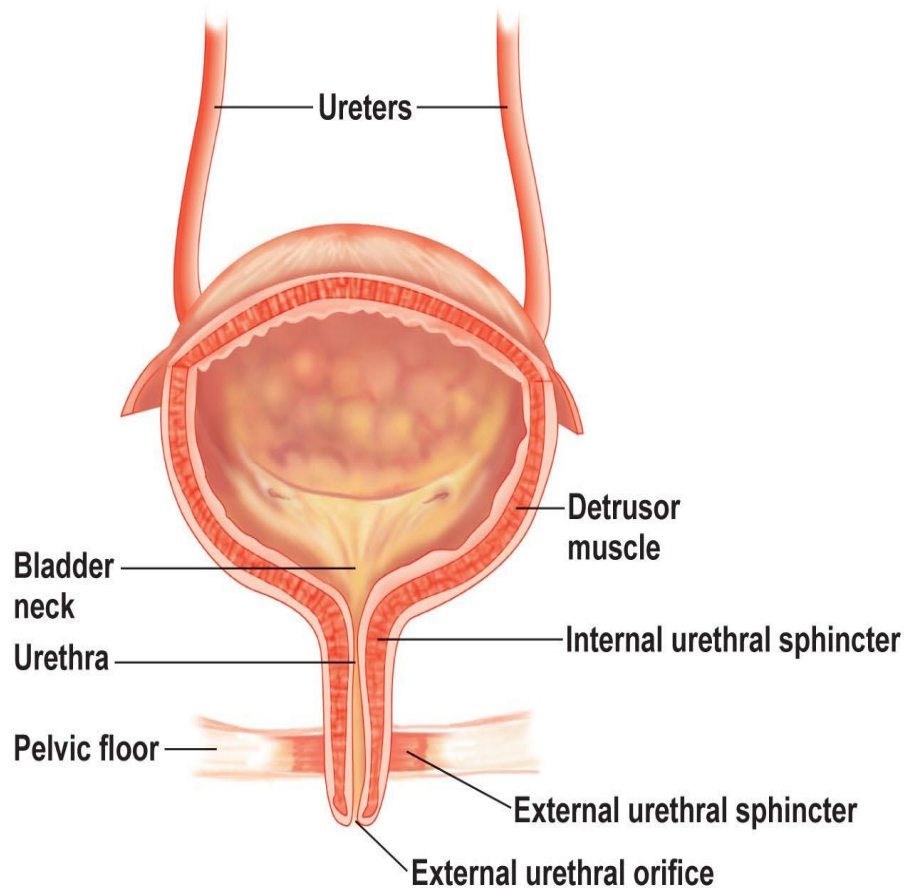
Normal bladder residual volume: < 50 ml

1<sup>st</sup> urge to void: 150-200ml

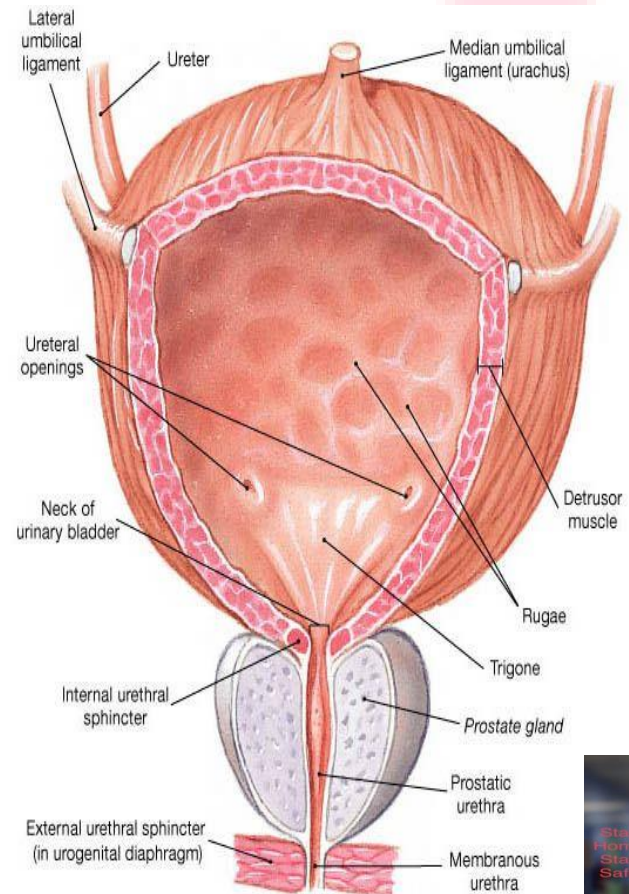
Normal Bladder Capacity: 300-500 ml



# Anatomy of the bladder



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(c) Male bladder, anterior view



# Types:

Stress  
Incontinence

Urge  
Incontinence

Mixed  
Incontinence

Overflow  
Incontinence

Functional  
Incontinence

Continuous  
Incontinence





# Risk factors

Advanced age

Prostate  
surgery/pelvic  
surgery/ radiation

Hx of UTI

Neurological disease  
[stroke, impaired  
cognition, spinal  
cord injury]

Constipation

Depression

COPD

Smoking

Sleep Apnea

Parity

Mode of delivery

Obesity





# Epidemiology

- Urinary incontinence affects up to 7% of children older than 5 years, 10-35% of adults, and 50-84% of the elderly persons in long-term care facilities
- Age is the single largest risk factor for urinary incontinence, although at any age, urinary incontinence is more than 2 times more common in females than in males.
- Urge incontinence is the most common type of UI in males.
- Stress incontinence is the most common type of UI in females.



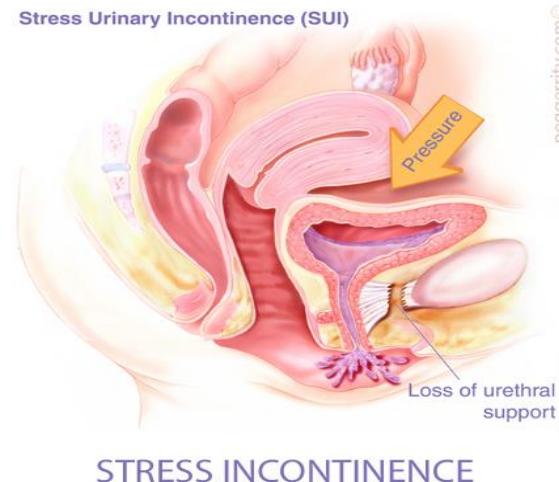
# Urinary incontinence

- Urinary incontinence is defined by the International Continence Society as the involuntary loss of urine that represents a hygienic or social problem to the individual.
- Urinary incontinence can be thought of as a symptom as reported by the patient, as a sign that is demonstrable on examination, and as a disorder.



# Stress incontinence

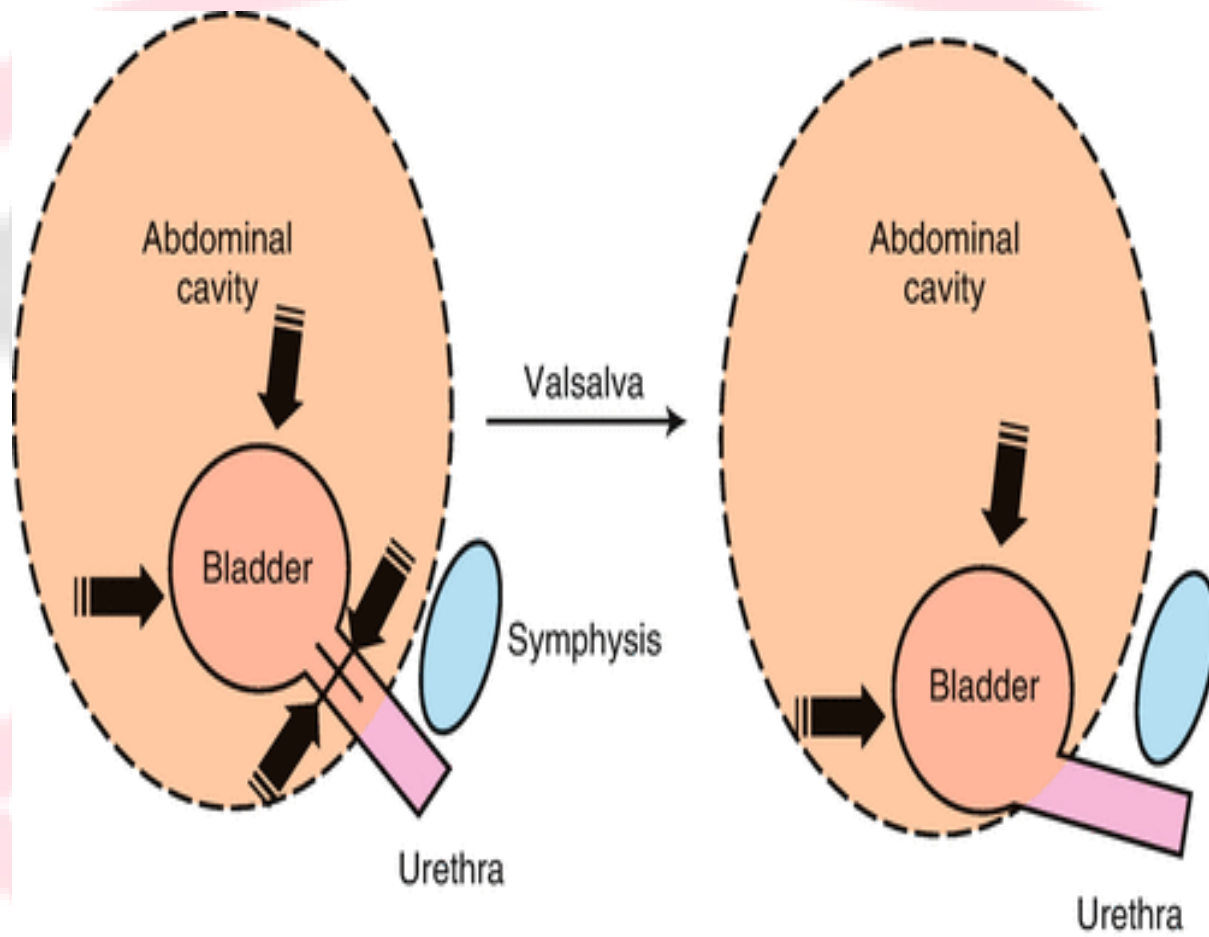
- **Is** the involuntary leakage of urine with exertion, sneezing, or coughing. Leakage may be provoked by minimal or no activity when there is severe urethral sphincter damage.



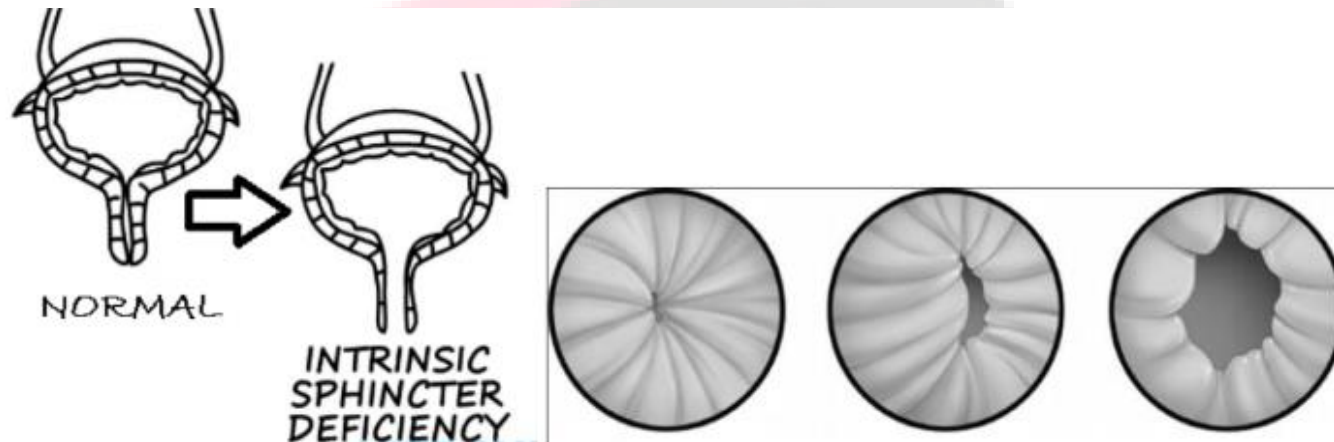
# Etiology in females

- **[1] Urethral Hypermobility (75-80%)**
- **In normal conditions :** The normal bladder holds urine because the intra-urethral pressure exceeds the intra-vesical pressure (urine stays in the lower pressure area). Under conditions of stress & abrupt increases in intra-abdominal pressure , this pressure gradient will be maintained by the two *Pubourethral ligaments* which surround the urethra like a sling creating a sphincter that provides a strong suspensory mechanism for the urethra and serves to hold it & transmit the pressure equally by pushing the urethra against the intact fascia and thus closing it and maintaining continence . In addition, a reflex contraction of the Levator Ani compresses the mid-urethra, decreasing the likelihood of urine loss.
- **In cases of urethral hyper-mobility :** When there is vaginal wall relaxation , downward displacement of the bladder neck and proximal urethra occur, so there will be no longer equal transmission of pressure & the defective fascia allows for posterior rotation of the vesico-urethral junction. As a result , the normal urethral resistance is overcome by this increased bladder pressure, and urethra opens allowing for urine leakage.





- **[2] Intrinsic Sphincter Deficiency**
- Normally, the intra urethral resting pressure is  $>60$  cmH<sub>2</sub>O which is higher than intra-vesical pressure → so no leak of urine occurs. **In cases of ISD "the leaky valve"**: The patient usually has a history of a pelvic surgery (estrogen deficiency also mentioned in the book) ,It may lead to unopposed urethral walls, which will cause the Intra-urethral resting pressure to fall below 20 cmH<sub>2</sub>O ,so the urethra fails to close in response to increases in intra-abdominal pressure which facilitates urine loss.



# ETIOLOGY IN MALES

- SUI in males is commonly due to **poor urethral sphincter function**.
- It is usually secondary to:
  - 1. Prostatic surgery ( mcc: TURP and radical prostatectomy)
  - 2. History of pelvic trauma
  - 3. Neurologic disorder (eg, traumatic spinal cord injury, spina bifida).





# Urge incontinence

- **Is** the involuntary leakage of urine accompanied by urgency. Urgency is the complaint of a sudden and compelling desire to pass urine that is difficult to defer.
- Commonly-reported precipitants include running water, hand washing, and going out in the cold.



# Some terms

- The corresponding urodynamic term = *detrusor overactivity*,
- Detrusor Overactivity= the observation of **involuntary detrusor contractions** during filling cystometry.
- Urge incontinence may be a result of detrusor myopathy, neuropathy, or a combination of both.
  - When the identifiable cause is unknown, it is termed **idiopathic urge incontinence**.
  - When a definable causative neuropathic disorder exists, it is termed **neurogenic detrusor overactivity**.
- The term “Overactive bladder” describes a syndrome of urinary urgency, usually accompanied by frequency and nocturia, with or without urge urinary incontinence, in the absence of urinary tract infection or other obvious pathology.



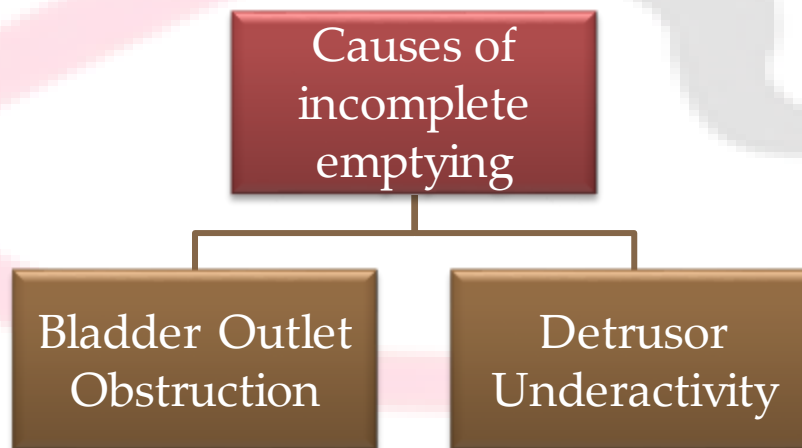
# MIXED INCONTINENCE

- Mixed incontinence is urinary incontinence resulting from a combination of stress and urge incontinence.
- Approximately 40-60% of females with incontinence have this combination.
- In mixed incontinence, the bladder outlet is weak and the detrusor is overactive.
- Mixed incontinence is a common finding in **older patients** with urinary incontinence disorders. Often, stress incontinence symptoms precede urge incontinence symptoms in these individuals.



# Overflow incontinence

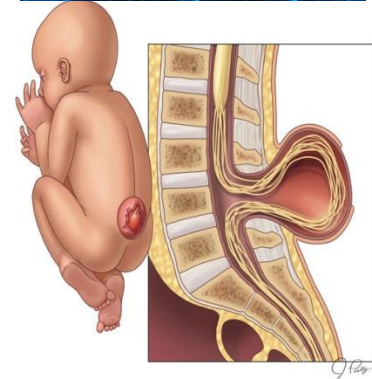
- Overflow incontinence typically presents with continuous urinary leakage or dribbling in the setting of incomplete bladder emptying.
- Associated symptoms can include weak or intermittent urinary stream, hesitancy, frequency, and nocturia.



# [1] Detrusor Underactivity

*Detrusor underactivity may be caused by impaired contractility of the detrusor muscle, or impaired sensory function.*

- Causes include
  1. **Diabetes Mellitus**
  2. **Lumbosacral Nerve Disease From Tumors**
  3. **Myelomeningocele**
  4. **MS**
  5. **Prolapsed Intervertebral Disks**
  6. **High Spinal Cord Injuries**
- In most cases, both sensory and motor neuropathies are present. The maximal storage capacity of the bladder is reached, oftentimes without the individual realizing that this has occurred. Incontinence occurs off the top of a chronically over-filled bladder. Effective emptying is not possible because of an acontractile detrusor muscle.

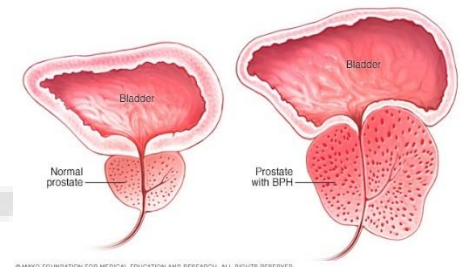
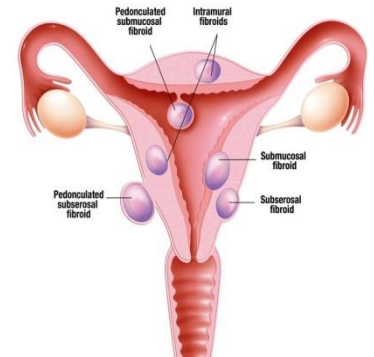


# [2] Bladder outlet obstruction

- Females:
- Urethral compression by
  1. fibroids
  2. advanced pelvic organ prolapse (ie, beyond the hymen),or overcorrection of the urethra from prior pelvic floor surgery.

Males due to:

1. BPH
2. Vesical neck contracture
3. Urethral stricture.



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Normal Vaginal Opening



Pelvic Organ Prolapse



# FUNCTIONAL INCONTINENCE

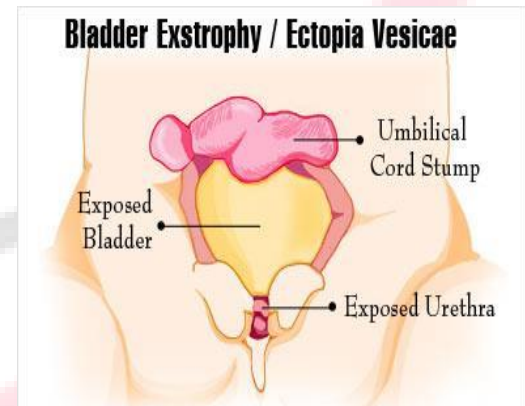
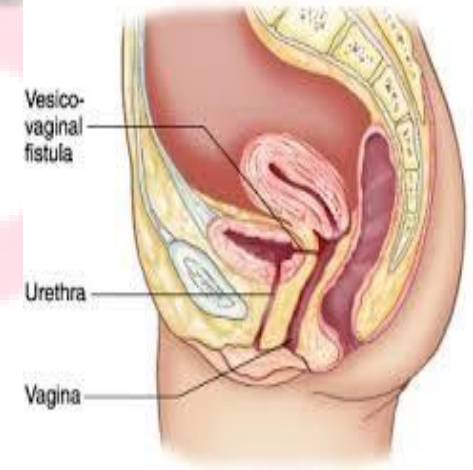
- Functional incontinence is seen in patients with normal voiding systems but who have difficulty reaching the toilet because of physical or psychological impairments.
- D - Delirium
- I - Infection [urinary]
- A - Atrophic urethritis or vaginitis
- P - Pharmacologic agents
- P - Psychiatric illness
- E - Endocrine disorders
- R - Reduced mobility
- S - Stool impaction





# Continuous INCONTINENCE

- This severe type of incontinence is characterized by constant or near constant leakage with no symptoms other than wetness.
- Causes:
  - 1- Scarring and fibrosis of urethra from previous surgeries
  - 2- Urogenital fistula
  - 3- Pelvic irradiation
  - 4- Congenital malformation of genitourinary tract (bladder extrophy ,epispadias, and ectopic ureters)



# Evaluation- History

The key components of the history include:

- ● Onset and temporal course of incontinence
- ● Severity
- ● Associated symptoms
- ● Precipitants
- ● Bowel function
- ● Sexual function
- ● History of prostate disease
- ● Comorbidities
- ● History of pelvic surgery
- ● Obstetric history.



# Evaluation-History



Relevant urinary symptoms include frequency, volume, severity, hesitancy, precipitating triggers, nocturia, intermittent or slow stream, incomplete emptying, continuous urine leakage, and straining to void

- **Stress urinary incontinence** is associated with urine loss with increases in intra-abdominal pressure, such as occurs with laughing, coughing, or sneezing. Urine volume lost may be small or large. There is no urge to urinate prior to the leakage.
- **Urgency incontinence/overactive bladder** is associated with frequent, small volume voids that may keep the patient up at night or worsen after taking a diuretic. The patient has a strong urge to void with an inability to make it to the bathroom in time.
- **Overflow incontinence** due to detrusor muscle underactivity is characterized by the painless loss of urine with no warning or triggers. The volume leaked may be small or large. Urine loss often occurs with changes in position. This may be associated with urinary hesitancy, slow flow, urinary frequency and nocturia and a sensation of incomplete emptying. Women with obstruction often need to strain to pass their urine.

# Evaluation-History

- **Systemic symptoms** – We evaluate patients with incontinence for urinary tract infection (UTI), asking about symptoms such as fever, dysuria, pelvic pain, and hematuria
- We also ask about changes in bowel function (eg, constipation). In older adults, we typically ask about and assess functional status, mobility, and cognitive status.
- **Medications** – Some medications can contribute to urinary incontinence. **Alcohol** and **caffeine** intake should be specifically elicited.
- **Impact on quality of life.**



# EVALUATION- Physical examination (females)

- Examine the abdomen for a palpable bladder
- Pelvic examination with a speculum .
- Cough Stress Test
- Urethral hypermobility is assessed with the Q-tip test.
- Neurologic examination : not necessary in the initial evaluation of all women with incontinence unless patients present with sudden onset of incontinence (especially urgency symptoms) or new onset of neurologic symptoms.



# EVALUATION- Physical examination (males)

- 1. Uncircumcised men should be checked for **phimosis and balanitis**
- 2. The position of the urethral meatus should be noted, as a very proximal position (**hypospadias**) may cause post-void dribbling and other bothersome symptom.
- 3. The **scrotal skin** should be examined for infections or sebaceous cysts.
- 4. The **scrotal contents** should be gently palpated to evaluate for masses.
- 5. The inguinal region should be assessed for the presence of a **hernia**, since straining in men with partial urinary obstruction can worsen an inguinal hernia.
- 6. Digital rectal examination: **Anal sphincter tone**, and the presence of rectal masses or fecal impaction should be noted.  
• **Prostate size** and consistency should also be assessed. •

# EVALUATION-

## Laboratory tests

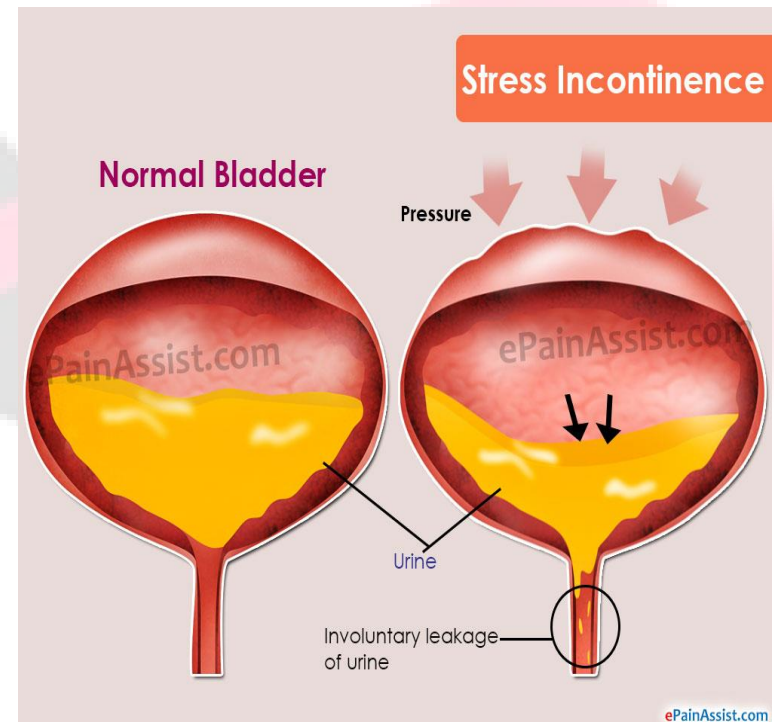
- A **urinalysis** should be performed in all patients, and urine culture performed if a urinary tract infection (UTI) is suggested on screening
- We do not routinely check **renal function** unless there is concern for severe urinary retention resulting in hydronephrosis.
- Other laboratory testing is determined by signs or symptoms elicited on history and physical exam, such as **PSA**



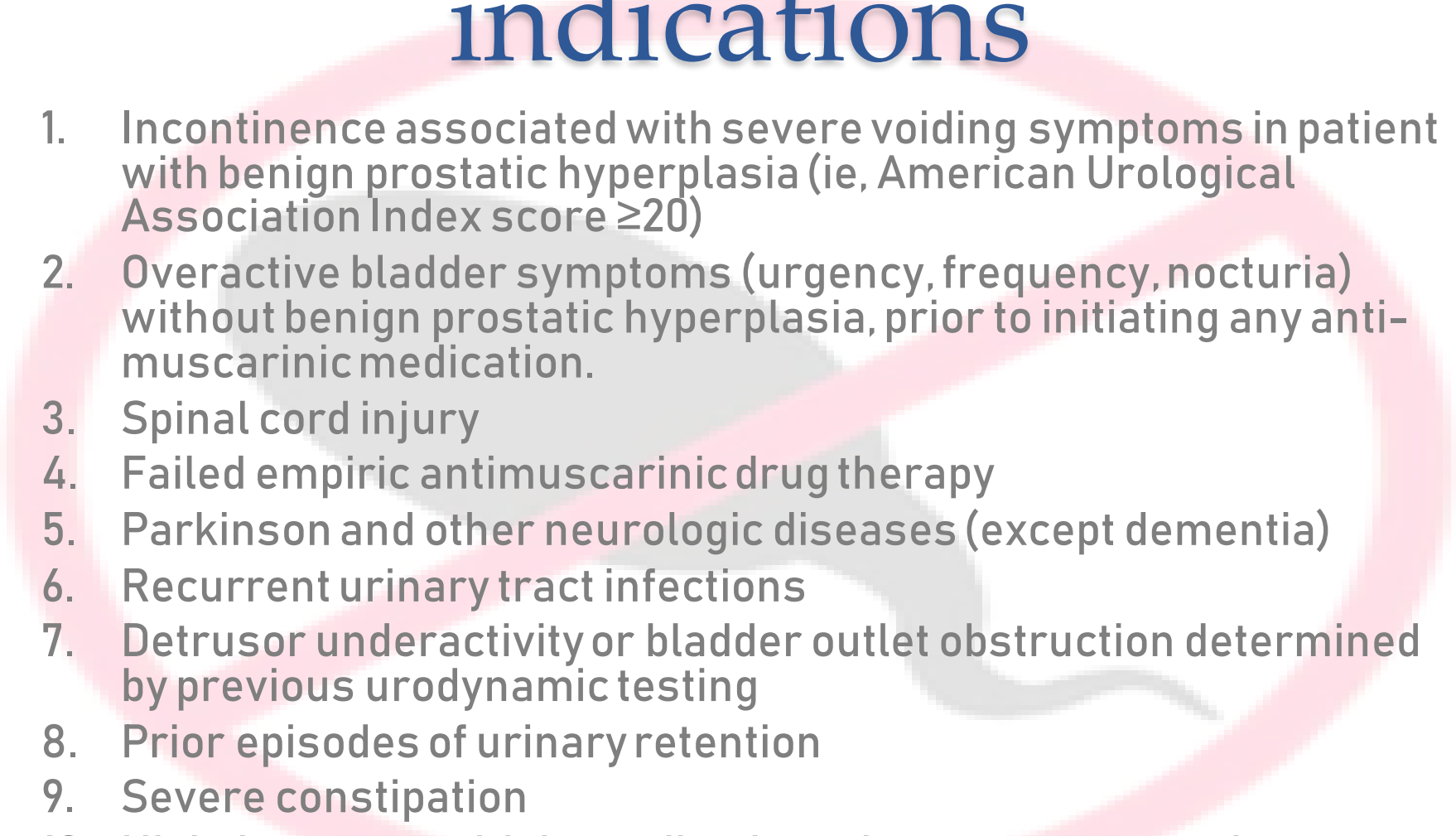


# Clinical tests

- **Bladder stress test**
- In patients with suspected stress incontinence, we perform the bladder stress test to confirm the diagnosis.
- This test is performed with the patient in the standing position with a comfortably **full** bladder.
- While the examiner visualizes the urethra by separating the labia, the patient is asked to **Valsalva** and/or cough vigorously. The clinician observes directly whether or not there is leakage from the urethra



# Post void residual indications

1. Incontinence associated with severe voiding symptoms in patient with benign prostatic hyperplasia (ie, American Urological Association Index score  $\geq 20$ )
  2. Overactive bladder symptoms (urgency, frequency, nocturia) without benign prostatic hyperplasia, prior to initiating any anti-muscarinic medication.
  3. Spinal cord injury
  4. Failed empiric antimuscarinic drug therapy
  5. Parkinson and other neurologic diseases (except dementia)
  6. Recurrent urinary tract infections
  7. Detrusor underactivity or bladder outlet obstruction determined by previous urodynamic testing
  8. Prior episodes of urinary retention
  9. Severe constipation
  10. High doses or multiple medications that can suppress detrusor contractility and/or increase urethral sphincter tone
  11. Diabetes mellitus with peripheral neuropathy
- 

# PVR

- A PVR of  $<50$  mL = adequate emptying
- A PVR  $>200$  mL = inadequate and suggestive of either detrusor weakness or obstruction.
- However, a PVR greater than 200 to 300 mL **DOES NOT** in itself require treatment in the absence of symptoms or recurrent infection





# Clinical tests

- **Cotton swab test** —The cotton swab test is used to assess urethral mobility in women.
  1. To perform the test, place the patient in a dorsal lithotomy position.
  2. Make sure the examining table is parallel to the floor.
  3. Insert a lubricated sterile cotton swab through the urethra until the cotton portion is completely in the bladder.
  4. Then, gently pull back on the cotton swab until the cotton is against the bladder neck.
  5. The swab is pulled back until increased resistance is met, indicating that the cotton tip is entering the urethra.
  6. The patient then is instructed to perform a Valsalva maneuver or to contract the abdominal muscles. Having the patient put forth a maximal effort is important.
  7. The change in angle when the swab is deflected upward with maximal strain,. A change of greater than  $30^{\circ}$  indicates urethral hypermobility

## Q-tip (cotton swab) Test

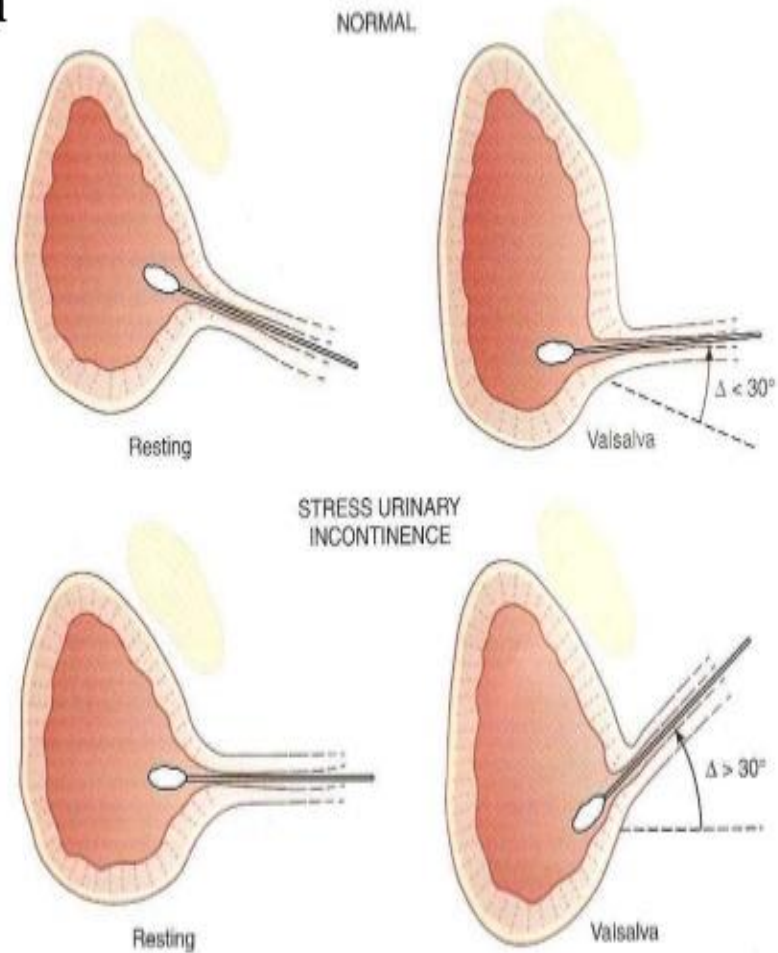


FIGURE 23-5 Diagrammatic representation of the Q-tip (cotton swab) test, showing mobility of the urethrovesical junction in a continent patient and a patient with stress urinary incontinence.



# Management

- Firstly: lifestyle modifications:
  1. Weight loss
  - 2. Dietary changes – Some beverages may exacerbate symptoms of urinary incontinence. We ask patients to reduce consumption of alcoholic, caffeinated, and carbonated. Decrease the amount of liquid consumed before bedtime.
  - 3. Constipation – Constipation can exacerbate urinary incontinence and increase the risks of urinary retention . Constipation should be managed and avoided when possible.
  - 4. Smoking cessation
  - 5. Bladder Drill (UUI)
  - 6. Self report voiding diary (UUI)
- Secondly: Pelvic floor muscle exercises (Kegel exercises)



# Management

- Thirdly: Pharmacologic therapy —

- UUI:

1. Anti-cholinergics
2. B3 agonists
3. TCAs
4.  $\alpha$  blockers in men with UI associated with BPH

- SUI:

1. Duloxetine (SSRI)- approved in EU, not in US

**NOTE:**

- Anticholinergics are contraindicated in: Myasthenia graves, Crohns, Urinary retention, closed-angle glaucoma.
- B3 agonists are contraindicated in HTN and heart disease





# Management

- **Overflow Incontinence:** Intermittent self catheterization or continuous suprapubic drain
- **Functional Incontinence:** Treat the underlying cause if possible.



# Surgery

## **Urge incontinence :**

In the minority of patients in whom medical therapy is ineffective for urgency incontinence, treatment options include

- Electrical stimulation
- Injection of botulinum toxin via cystoscopy
- Augmentation cystoplasty.

## **Stress incontinence:**

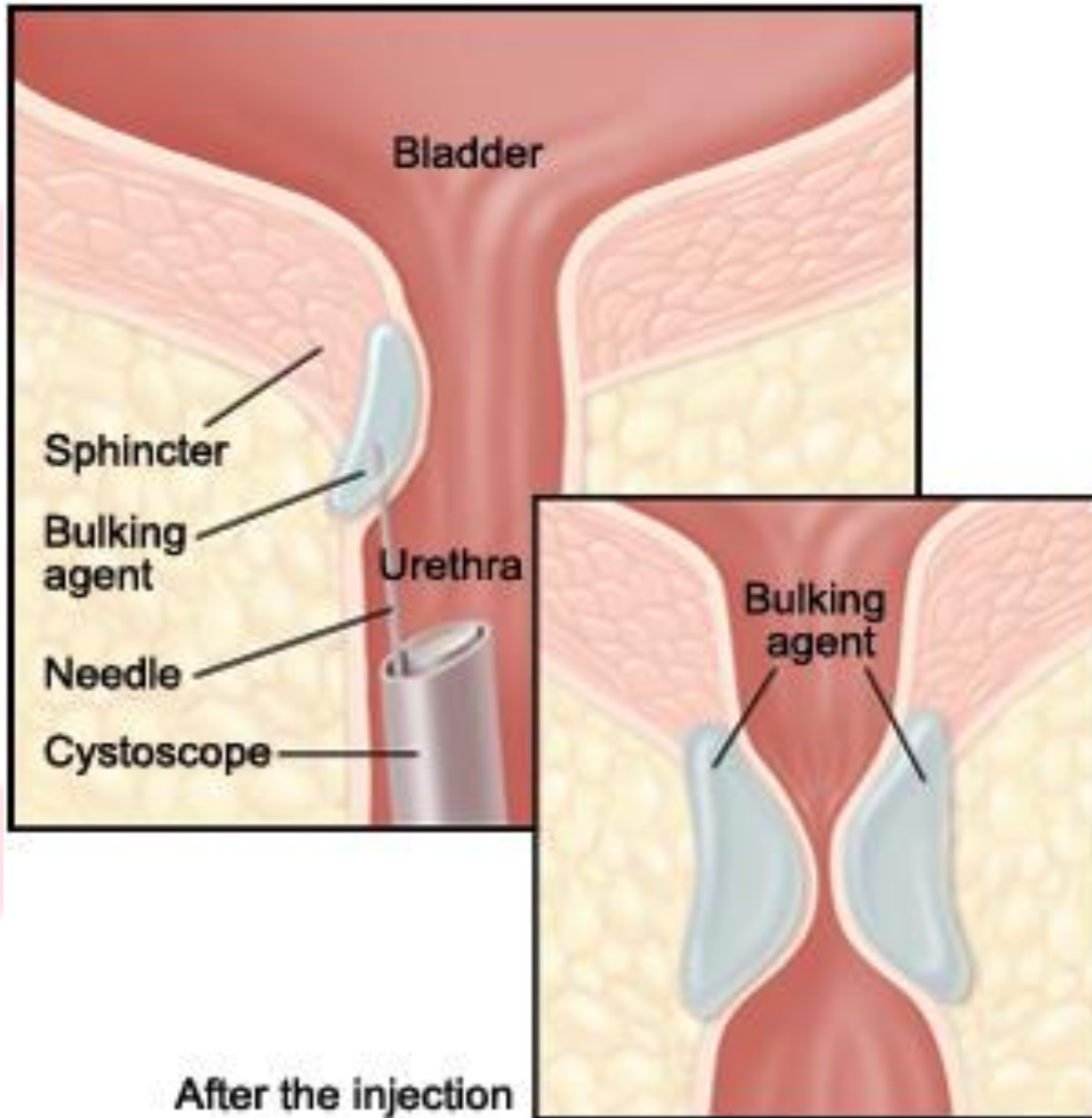
The most commonly utilized interventions for male stress incontinence are

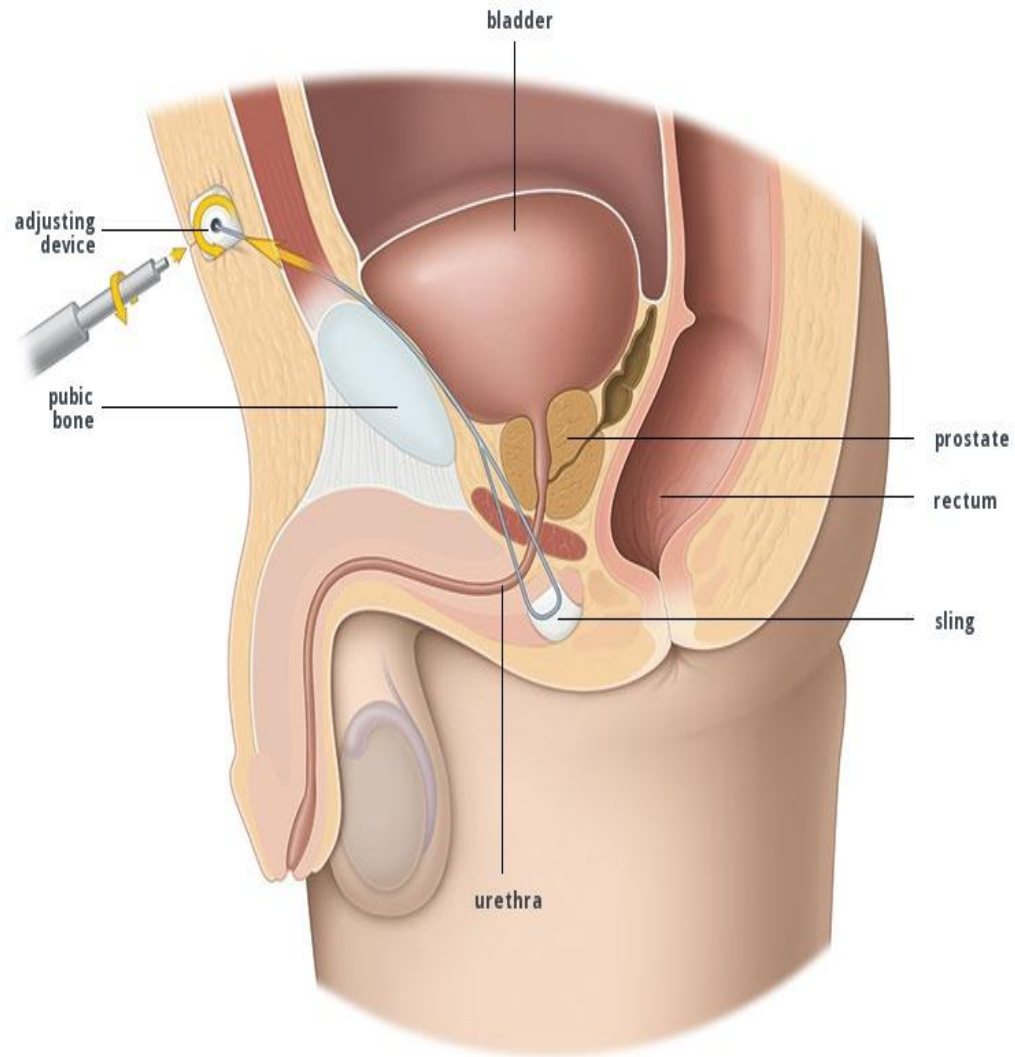
- Transurethral bulking agents
- Perineal slings
- Artificial urinary sphincter.

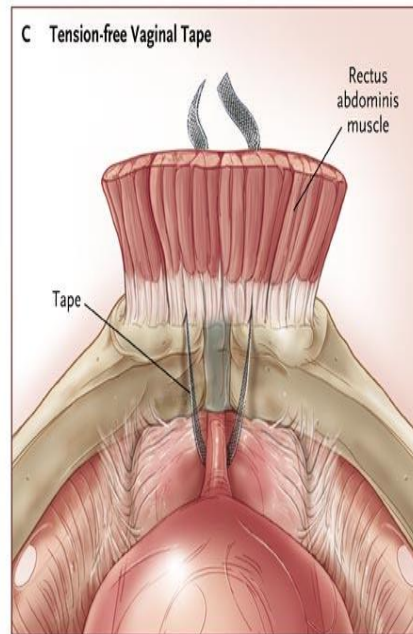
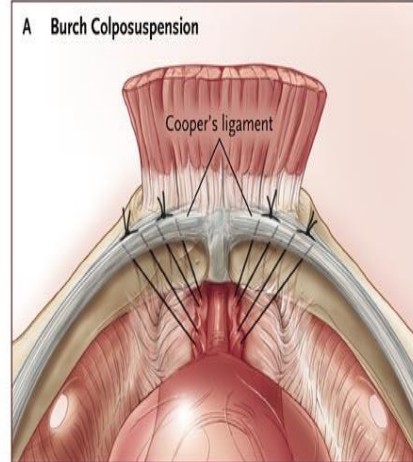
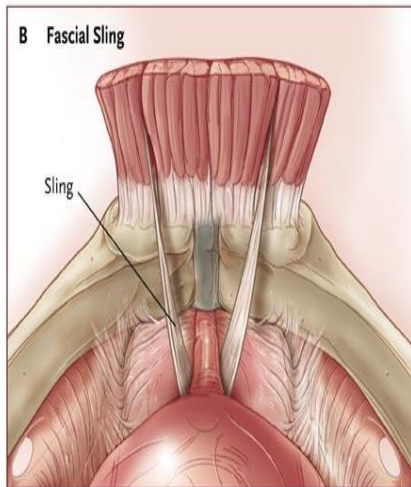
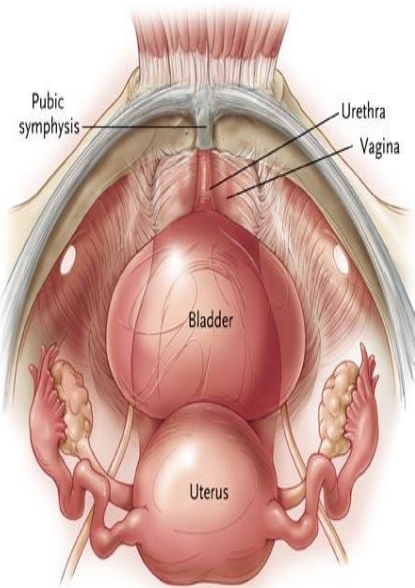
In females:

- TVT: Suburethral Sling Procedure





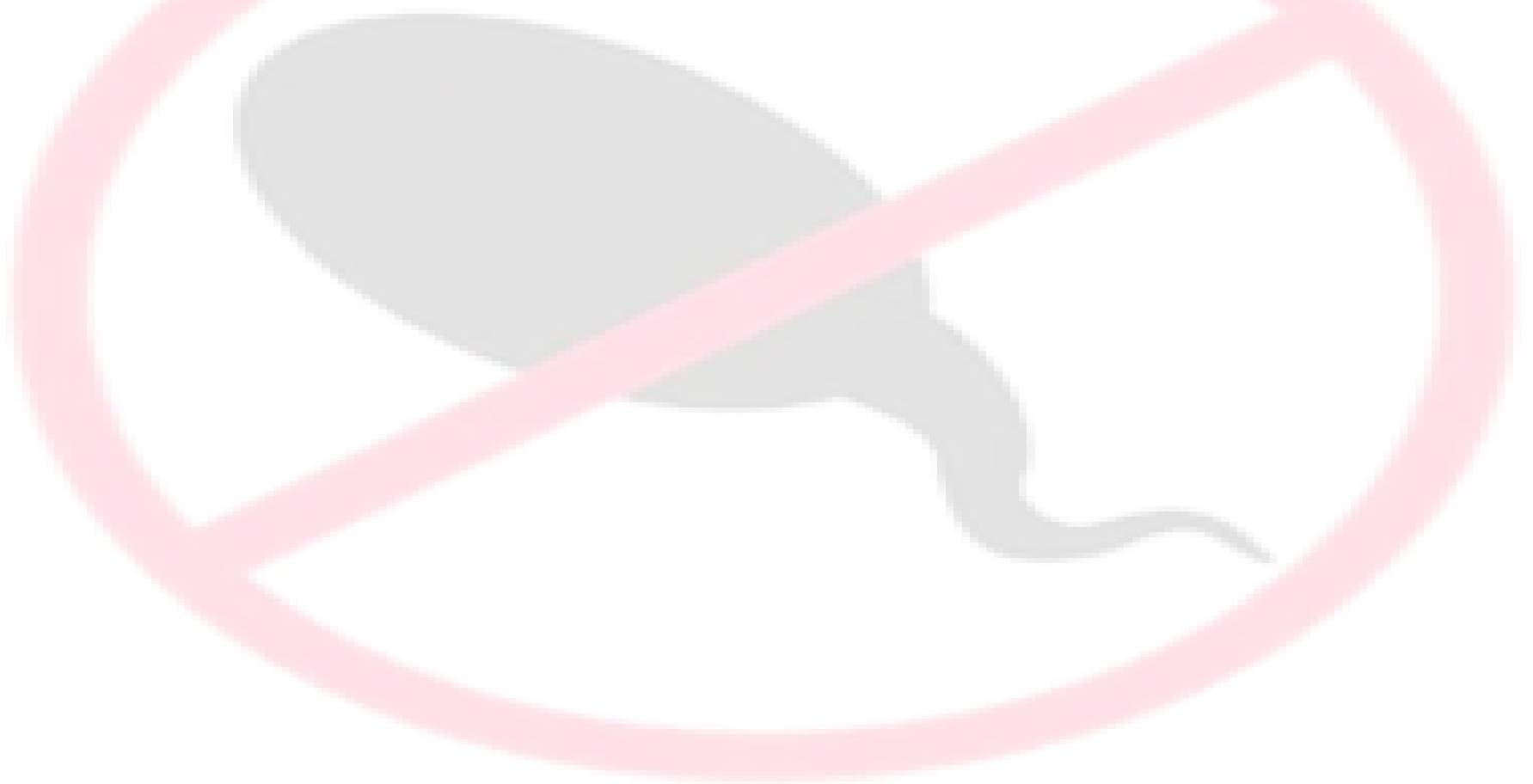




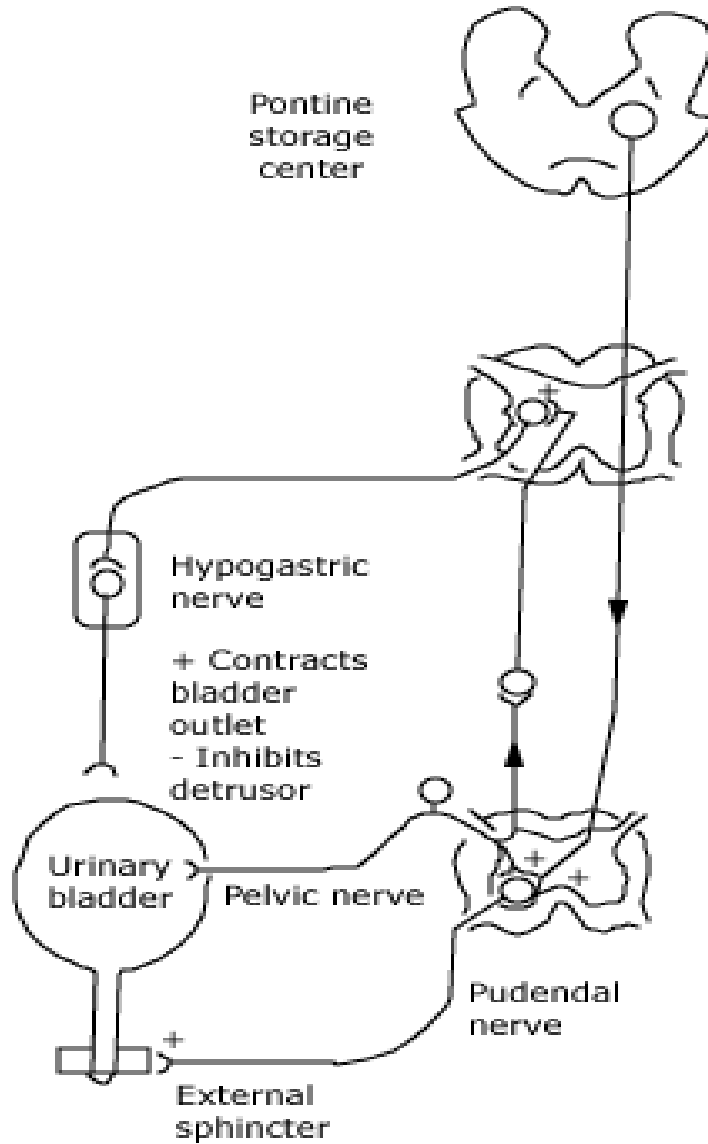
- The gold-standard procedures include the Burch colposuspension (Panel A) and the fascial sling (Panel B); a newer, minimally invasive sling procedure is the use of tension-free vaginal tape (Panel C)



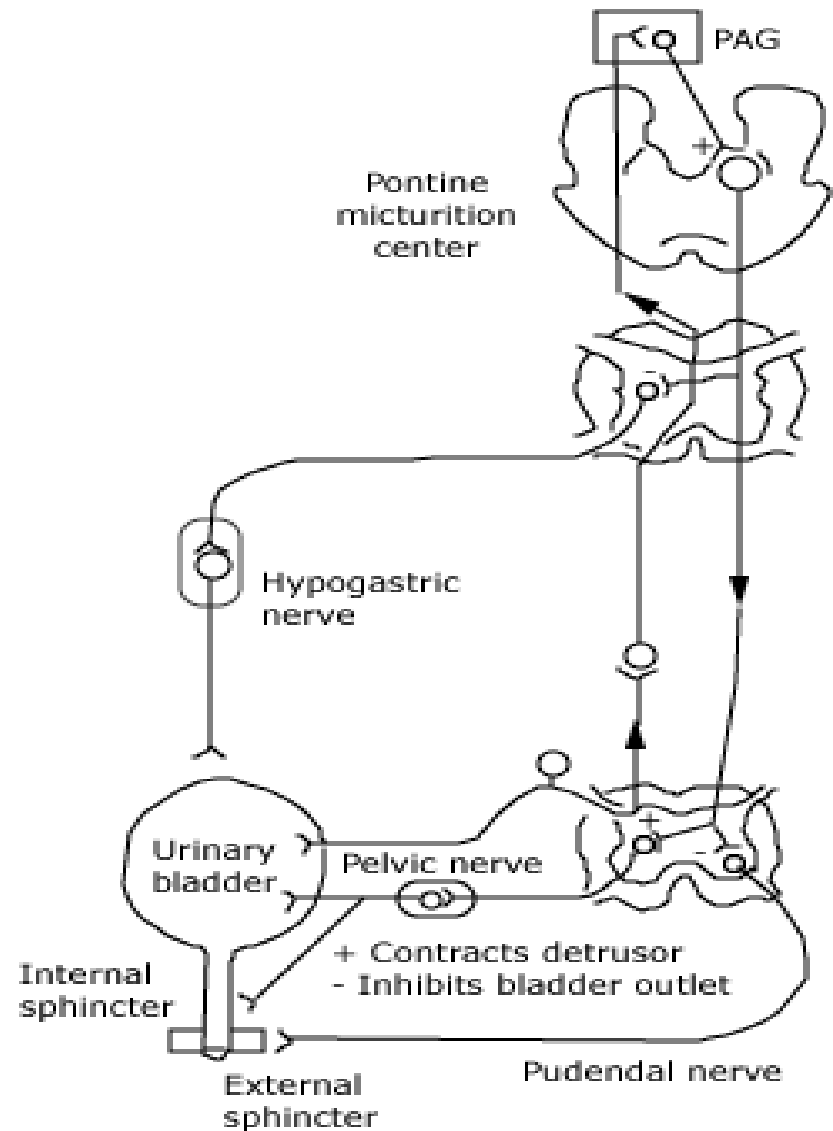
# Neurogenic Bladder



### A: Storage reflexes



### B: Voiding reflexes

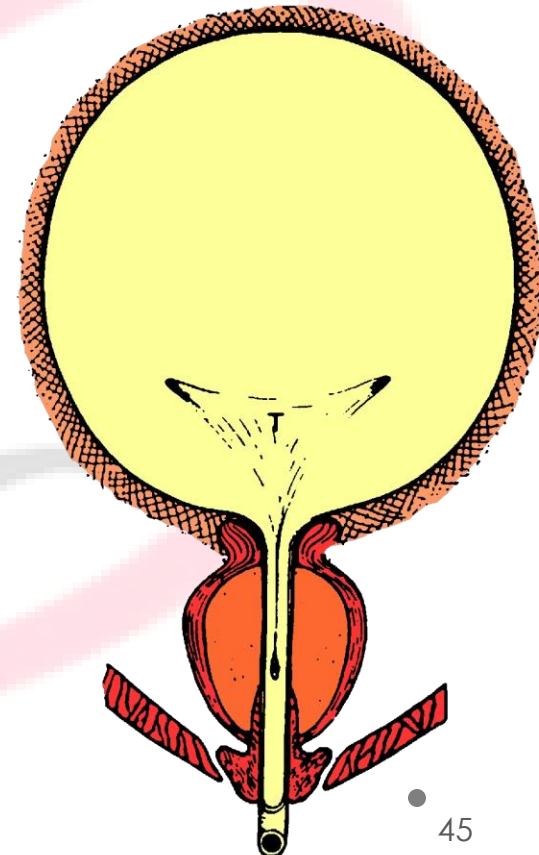




- (A) Urine storage reflexes. During the storage of urine, distention of the bladder produces low level vesical afferent firing, which in turn stimulates (1) the sympathetic outflow to the bladder outlet (base and urethra) and (2) pudendal outflow to the external urethral sphincter. These responses occur by spinal reflex pathways and represent "guarding reflexes," which promote continence. Sympathetic firing also inhibits detrusor muscle and modulates transmission in bladder ganglia. A region in the rostral pons (the pontine storage center, or "L" region) increases external urethral sphincter activity. (B) Voiding reflexes. During elimination of urine, intense bladder afferent firing activates spinobulbospinal reflex pathways passing through the pontine micturition center, which stimulate the parasympathetic outflow to the bladder and internal sphincter smooth muscle and inhibit the sympathetic and pudendal outflow to the urethral outlet. Ascending afferent input from the spinal cord may pass through relay neurons in the periaqueductal gray (PAG) before reaching the pontine micturition center.

# LUTS

- Lower urinary tract symptoms (LUTS) are the subjective indicator of a disease or change in condition
- Defined from the individual's perspective
- Either be volunteered or described during clinical visit
- Usually qualitative
- Not necessarily due to LUT dysfunction: LUTS may indicate other pathologies e.g. urinary infection



# Classification

## Storage symptoms

- Altered bladder sensation •
- Increased daytime frequency •
- Nocturia •
- Urgency •
- Urinary incontinence •

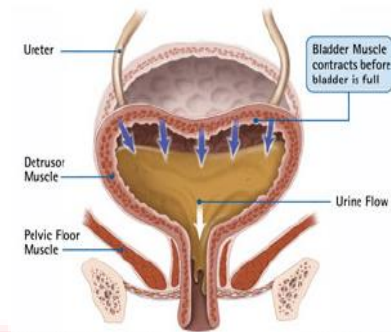
## Voiding symptoms

- Hesitancy •
- Intermittency •
- Slow stream •
- Splitting/spraying •
- Straining •
- Terminal dribble •

## Post micturition symptoms

- Feeling of incomplete bladder emptying •
- Post micturition dribble •

# Conditions associated with LUTS



- **Overactive bladder (OAB)**: storage syndrome defined as urgency with or without urge incontinence, usually with frequency and nocturia  $\neq$

**Detrusor overactivity (DO)**: urodynamic observation characterised by involuntary detrusor contractions (spontaneous/provoked) during the filling phase

- Male OAB symptoms are often caused by bladder dysfunctions such as detrusor overactivity (DO) and impaired detrusor contractility, bladder outlet obstruction (BOO), or a combination of bladder dysfunction and BOO since they often occur together. BOO may cause DO (via cholinergic denervation of the detrusor and consequent supersensitivity of muscarinic receptors to acetylcholine) but their co-occurrence is not always due to a cause-and-effect relationship.

# Conditions associated with LUTS (2)

## *Overactive Bladder (OAB)*

- Storage syndrome defined as urgency with or without urge incontinence, usually with frequency and nocturia

## Urge incontinence

- *Involuntary void of urine accompanied or immediately preceded by urgency.*

## Frequency

- More than 8 time a day

## Nocturia

- Individual has to wake at night  $\geq 1$  time to void, with each void preceded **and** followed by sleep

# Over active bladder

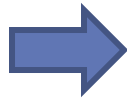
- Overactive bladder (OAB) is a syndrome characterised by urinary urgency, with or without urge urinary incontinence, usually with frequency and nocturia. OAB symptoms form a subset of storage LUTS (excluding types of incontinence other than urge urinary incontinence).
- Male OAB symptoms are often caused by bladder dysfunctions such as detrusor overactivity (DO) and impaired detrusor contractility, bladder outlet obstruction (BOO), or a combination of bladder dysfunction and BOO since they often occur together. BOO may cause DO (via cholinergic denervation of the detrusor and consequent supersensitivity of muscarinic receptors to acetylcholine) but their co-occurrence is not always due to a cause-and-effect relationship.
- DO is a frequent cause of OAB symptoms and is urodynamically characterised by involuntary detrusor contractions during the bladder filling phase.

# Urgency

Urgency

*A sudden desire to pass urine  
The key defining feature in  
OAB syndrome is urgency*

Nocturia and Frequency  
without Urgency



OAB

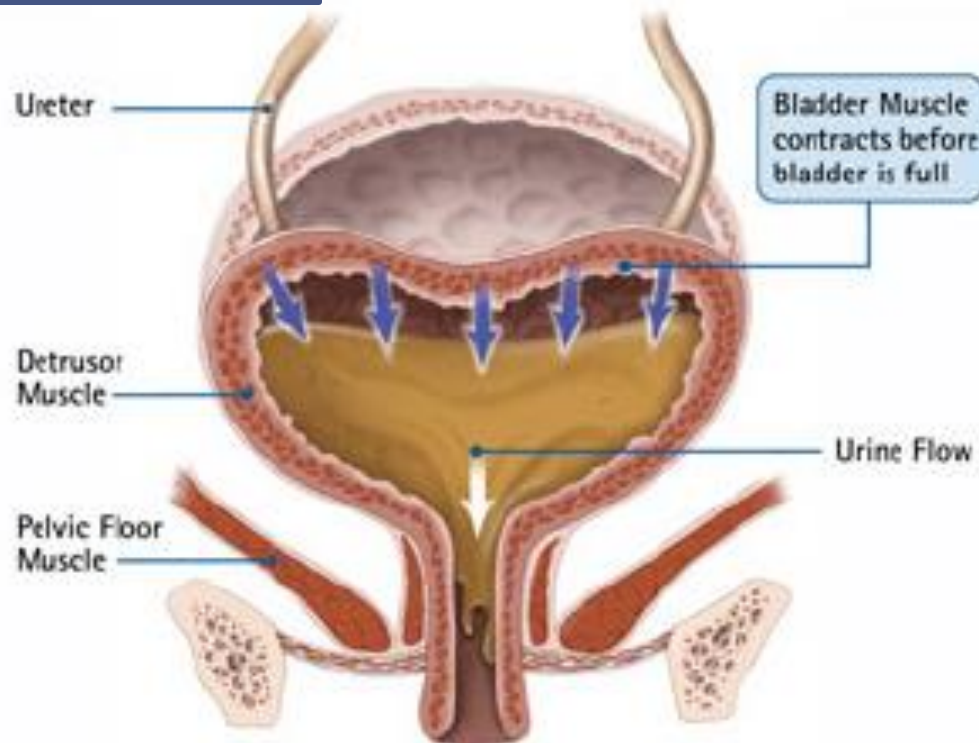




# Detrusor Overactivity

**Detrusor overactivity  
(DO)**

***Urodynamic observation  
Characterised by involuntary detrusor  
contractions (spontaneous/provoked)  
during the **filling phase*****



# Causes of LUTS?

Obstruction

Ageing

Pathological changes in the bladder

Voiding symptoms

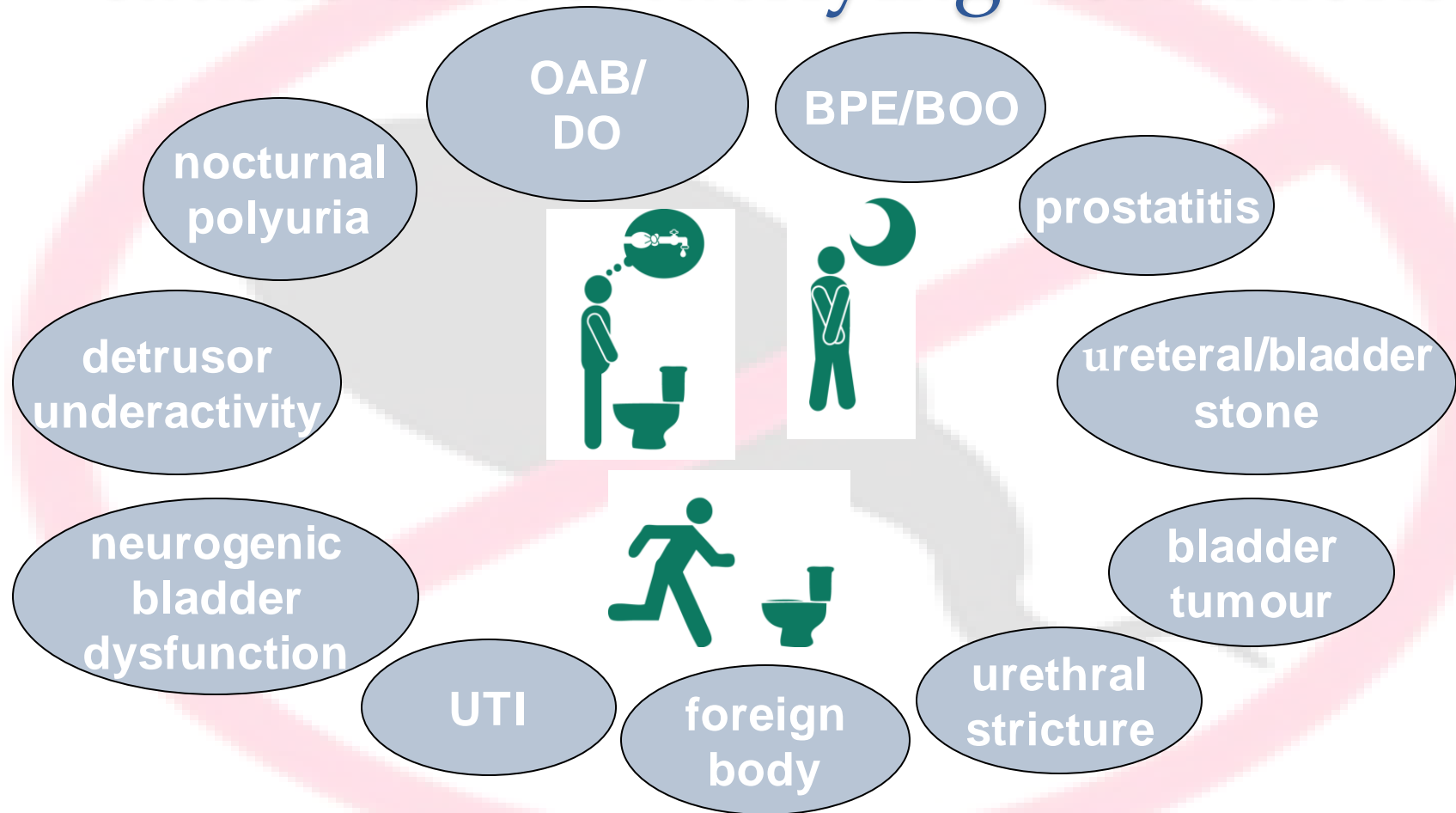
- slow stream •
- hesitancy •
- intermittency •
- ...

**Male  
LUTS**

Storage symptoms

- nocturia •
- urgency •
- frequency •
- ...

# LUTS are associated with diverse causes and underlying conditions

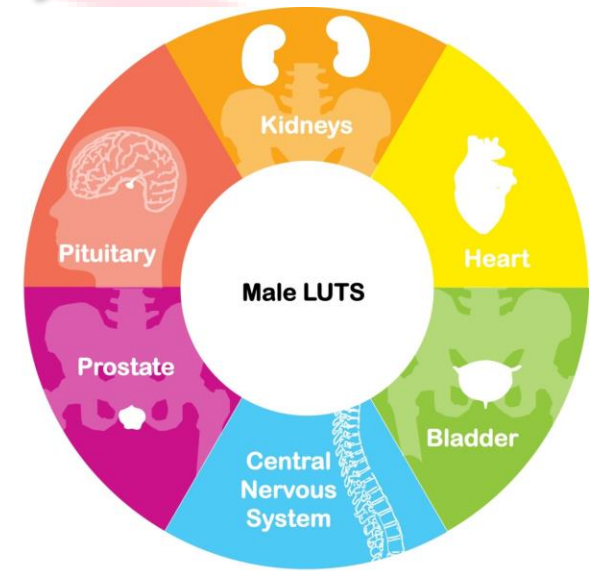


Adapted from Thorner DA and Weiss  
JP. Urol Clin North Am 2009;36:417-

● 29;  
Speakman MJ. Eur Urol Suppl

# LUTS can be associated with body systems outside the lower urinary tract

Male LUTS is believed to have a multifactorial aetiology. Male LUTS can even be due to extra-prostatic and extra-bladder conditions or diseases: other organs, such as the kidneys, heart, pituitary etc may be involved in disease pathogenesis



No LUTS in men are disease-specific; in fact, LUTS can be associated with various causes and underlying conditions. Some of these, such as OAB/DO, BPE/BOO, detrusor underactivity, nocturnal polyuria, neurogenic bladder dysfunction are commonly known, while others such as urinary stones or strictures, tumours or foreign bodies are less frequently recognised contributors or causes.



Diagnosis

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# No universal treatment BUT tailored to symptoms and causes

- Accurate diagnosis is prerequisite to optimal treatment
- Diagnostic assessments should be:
  - quick
  - easy
  - cheap
  - specific
  - not too bothersome for the pt
  - non- or minimally-invasive



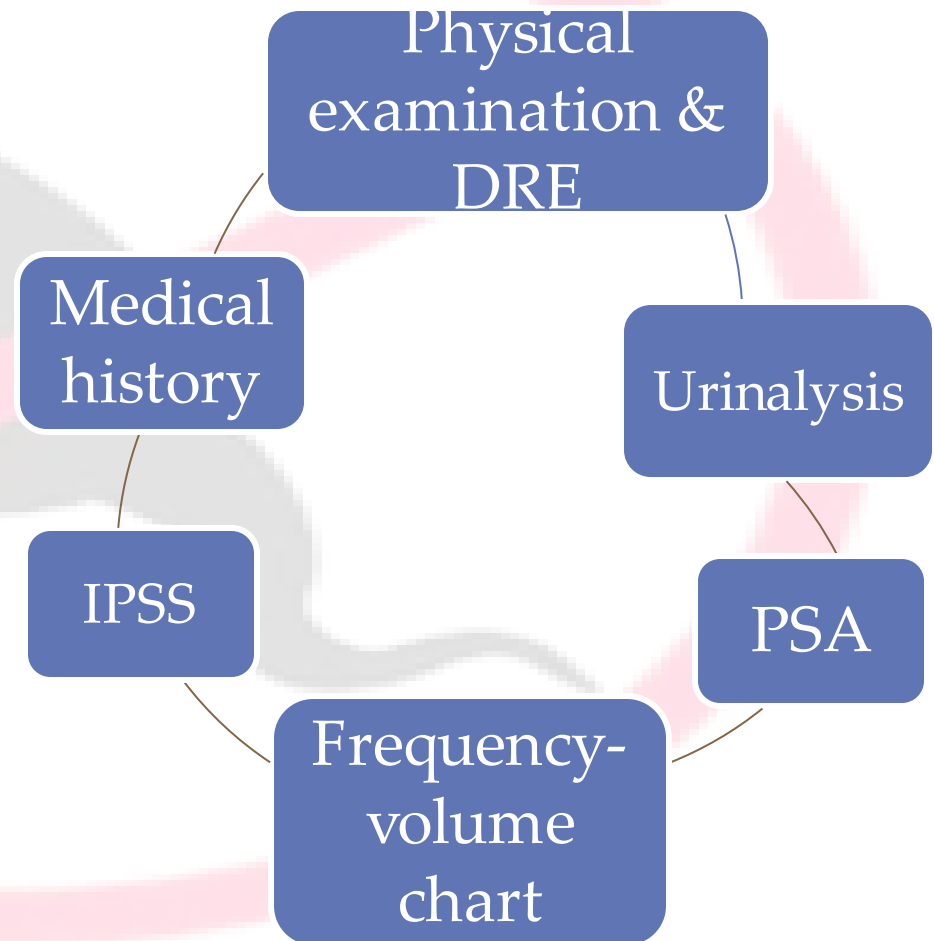
Identify (or at least give clues to) causes

Differentiate patients based on symptoms

# Recommended in initial evaluation of all patients

Recently published recommendations on the evaluation of male LUTS (by Chris Chapple on behalf of the International Scientific Committee and members of the committees, 6th International Consultation on New Developments in Prostate Cancer and Prostate Diseases, and an update by the AUA) recognise the diagnostic assessments listed in the diagram as recommended tests that need to be performed for all patients with LUTS during their initial visit.

DRE: digital rectal examination;  
IPSS: International Prostate Symptom Score;  
PSA: prostate-specific antigen





# IPSS: index of symptom severity BUT weighted towards voiding

	Not at all	Less than 1 time in 5	Less than half the time	About half the time	More than half the time	Almost always	Your score
<b>Incomplete emptying</b> Over the past month, how often have you had a sensation of not emptying your bladder completely after you finish urinating?	0	1	2	3	4	5	
<b>Frequency</b> Over the past month, how often have you had to urinate again less than two hours after you finished urinating?	0	1	2	3	4	5	
<b>Intermittency</b> Over the past month, how often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
<b>Urgency</b> Over the last month, how difficult have you found it to postpone urination?	0	1	2	3	4	5	
<b>Weak stream</b> Over the past month, how often have you had a weak urinary stream?	0	1	2	3	4	5	
<b>Straining</b> Over the past month, how often have you had to push or strain to begin urination?	0	1	2	3	4	5	

	None	1 time	2 times	3 times	4 times	5 times or more	Your score
<b>Nocturia</b> Over the past month, many times did you most typically get up to urinate from the time you went to bed until the time you got up in the morning?	0	1	2	3	4	5	

<b>Total IPSS score</b>	
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The IPSS questionnaire, originally the Americal Urological Association (AUA) symptom index, is used to score the severity of male LUTS by calculating the scores related to the frequency of 3 storage symptoms (frequency, nocturia, urgency – in red colour) and 4 voiding symptoms (feeling of incomplete emptying, intermittency, straining, weak stream – in green colour), and therefore, it is said to be more weighted towards voiding LUTS.

The IPSS is a good way of qualifying and quantifying LUTS. It gives you an idea of baseline level of symptoms and if repeated, will give you an idea of symptom improvement/progression

# IPSS: index of symptom severity BUT weighted towards voiding

	Not at all	Less than 1 time in 5	Less than half the time	About half the time	More than half the time	Almost always	Your score
<b>Incomplete emptying</b> Over the past month, how often have you had a sensation of not emptying your bladder completely after you finish urinating?	0	1	2	3	4	5	
<b>Frequency</b> Over the past month, how often have you had to urinate more than two hours after you finished urinating?					4	5	
<b>Intermittency</b> Over the past month, how often have you started again several times when you were urinating?					4	5	
<b>Urgency</b> Over the last month, how difficult have you had to urinate?					4	5	
<b>Weak stream</b> Over the past month, how often have you had a weak or interrupted stream?					4	5	
<b>Straining</b> Over the past month, how often have you had to strain to begin urination?					4	5	

**Score / Severity**

**Mild**                      0 to 7

**Moderate**                8 to 19

**Severe**                    20 to 35

	None	1 time	2 times	3 times	4 times	5 times or more	Your score
<b>Nocturia</b> Over the past month, many times did you most typically get up to urinate from the time you went to bed until the time you got up in the morning?	0	1	2	3	4	5	

<b>Total IPSS score</b>	
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# IPSS QoL: the most important question

If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that?

The IPSS questionnaire also contains 1 question assessing the patients' quality of life on a scale from 0-6. A higher score points to increased bother and reduced quality of life due to LUTS. It gives you an idea of baseline level of bother and if repeated, will give you an idea of disease improvement/progression

<b>Delighted</b>	<b>Pleased</b>	<b>Mostly satisfied</b>	<b>Mixed – about equally satisfied and dissatisfied</b>	<b>Mostly dissatisfied</b>	<b>Unhappy</b>	<b>Terrible</b>
<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>

# Frequency-volume chart is valuable

- Frequency volume charts (voiding diary or time and amount voiding charts) usually record time and voided volume for each micturition during several 24-hour periods (usually 3). Also the time and volumes for each drink, as well as the frequency of urge/incontinence episodes and pad usage, can be assessed
- Over 48-72h: voiding time, voided volume, urge episodes, pad usage and fluid intake
- Non-invasive, inexpensive and highly informative
- Very useful if nocturia is the predominant symptom
- Helps to identify patients with nocturnal polyuria or excessive fluid intake which are common in the aging male.

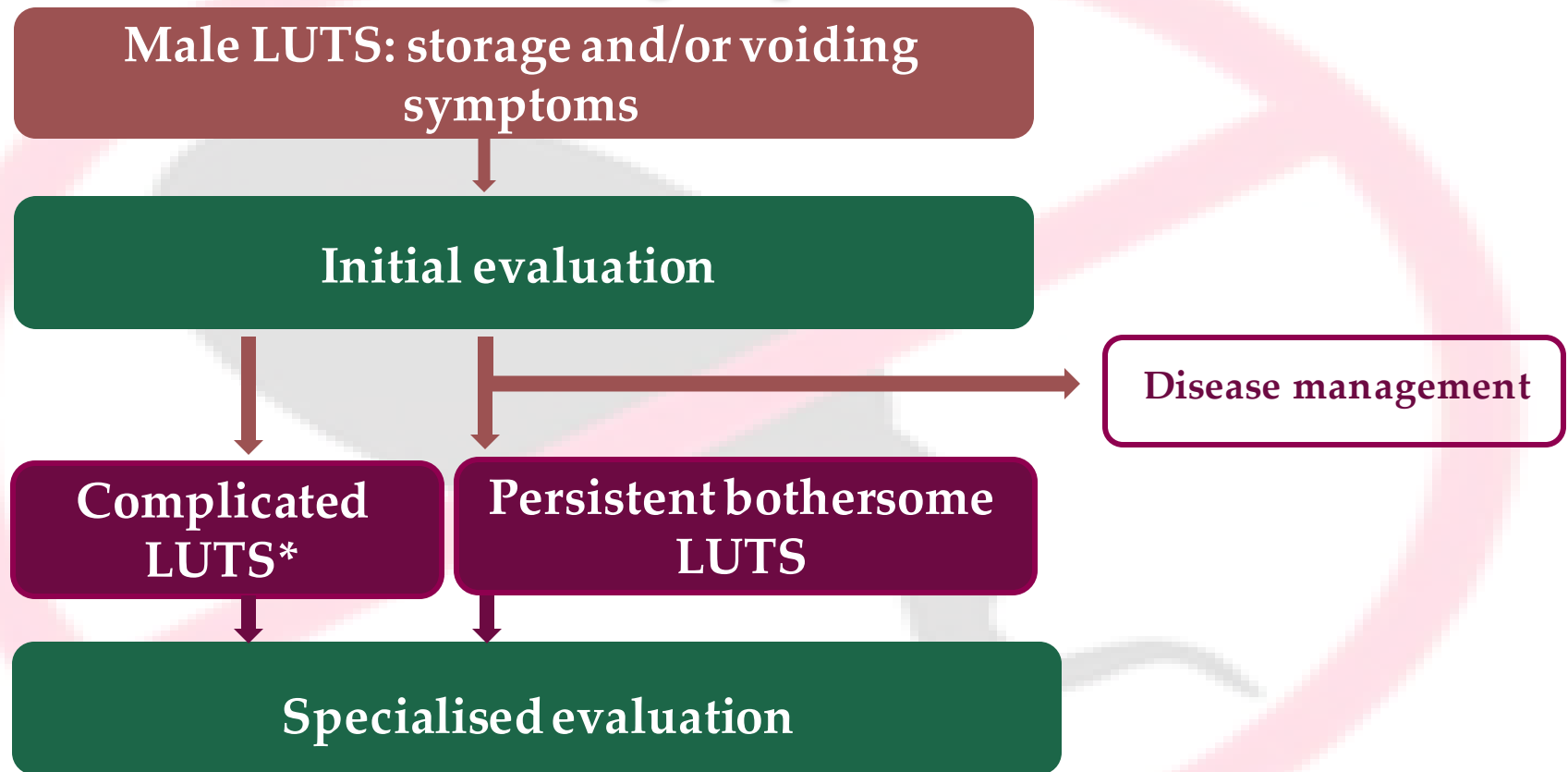
DAY	1			2			3		
	Volume IN mls/what	Volume OUT mls	U/L?	Volume IN mls/what	Volume OUT mls	U/L?	Volume IN mls/what	Volume OUT mls	U/L?
6am									
7am									
8am									
9am									
10am									
11am									
12am									
1pm									

Abrams P et al. J Urol 2009;181:1779-

U/L: urgency/leakage

- 87; Thorner DA and Weiss JP. Urol Clin North Am 2009;36:417-29

# Men with complicated or persistent bothersome LUTS should undergo specialised evaluation



\*Suspicious DRE, haematuria, abnormal PSA, pain, infection, palpable bladder, neurological disease

Abrams P et al. J Urol 2009;181:1779-

- 87; Chapple C. Eur Urol Suppl 2010;9:482-5

# Recommended in specialised evaluation of selected patients

Other validated  
questionnaires for  
symptoms & bother

Urodynamics

Uroflowmetry:  
 $Q_{\max}$

Ultrasound bladder:  
PVR

Ultrasound prostate/  
upper urinary tract

Endoscopy  
lower urinary tract

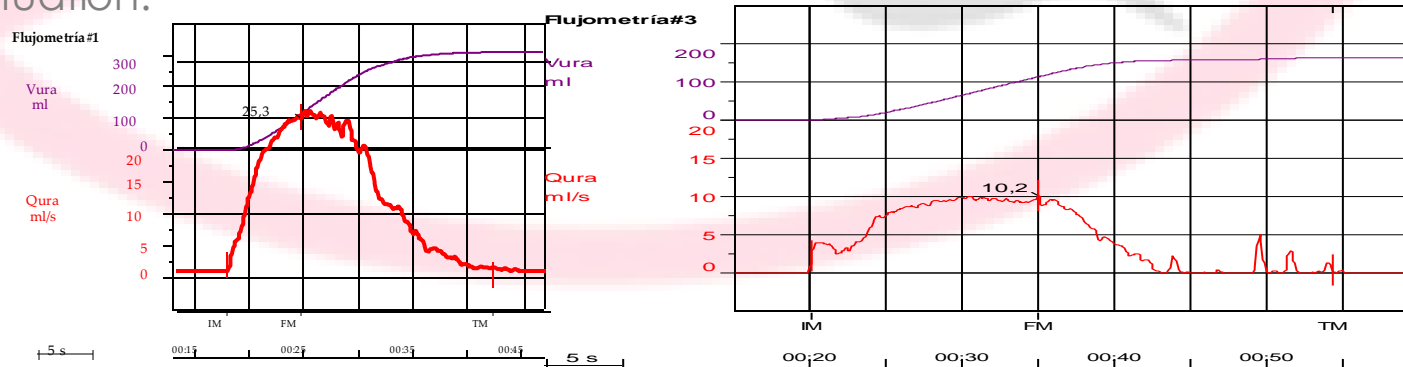
Abrams P et al. J Urol 2009;181:1779-

● 87; McVary KT et al. J Urol  
2011;185:1794-804



# Uroflowmetry: objective information about voiding function and efficacy

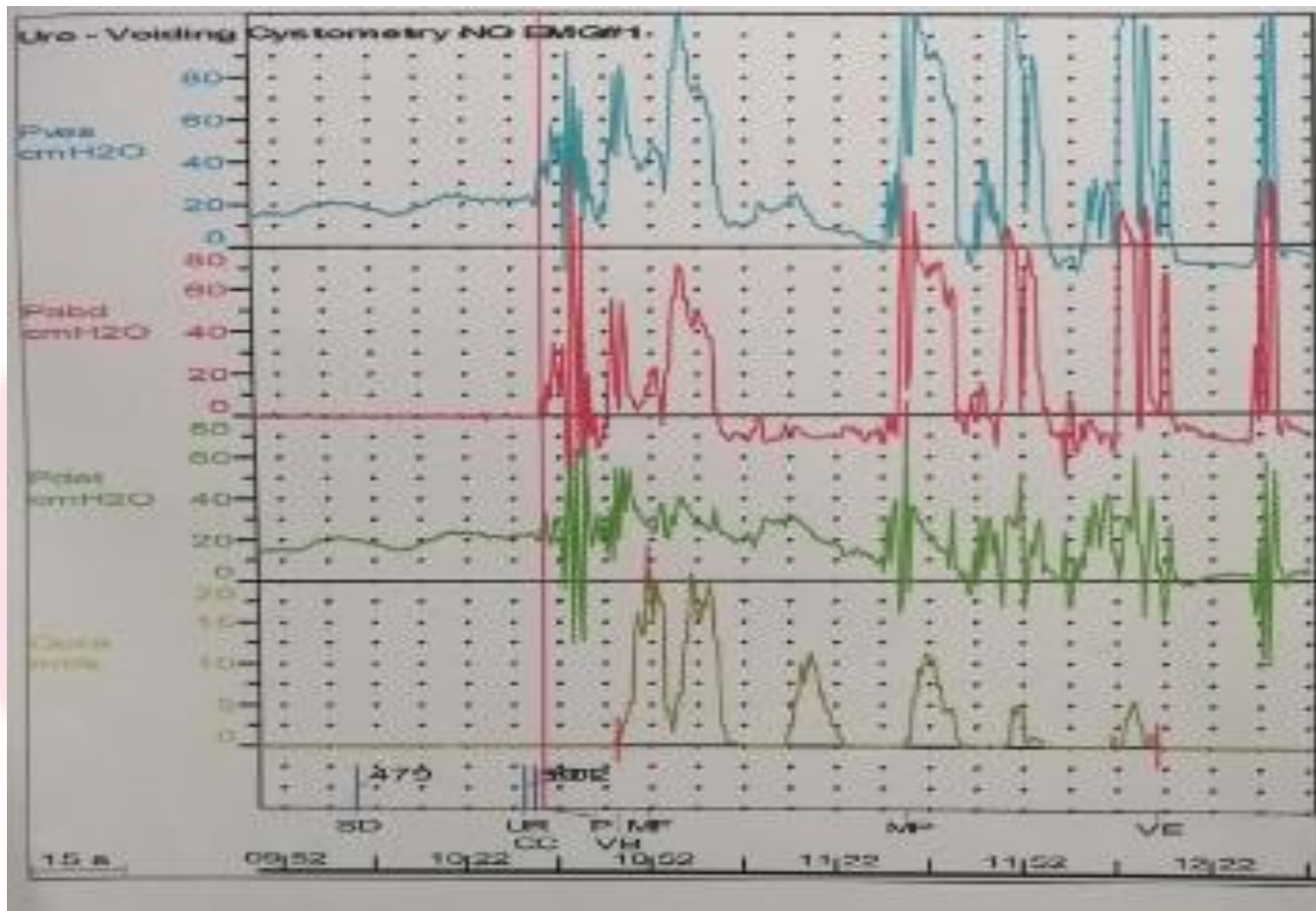
- Parameters:  $Q_{max}$ , voided volume, voiding time, flow curve
- Non-invasive and valuable to indicate:
  - Normal or dysfunctional voiding
  - bladder stones and the existence of BOO or detrusor underactivity. However, a low  $Q_{max}$  and high post void residual (PVR) does not distinguish between obstruction and decreased detrusor contractility: pressure-flow studies are the only valid method to make this distinction
  - Because of the non-invasive nature of the test and its clinical value, uroflowmetry might even be performed for all patients at the initial evaluation.



# UDS

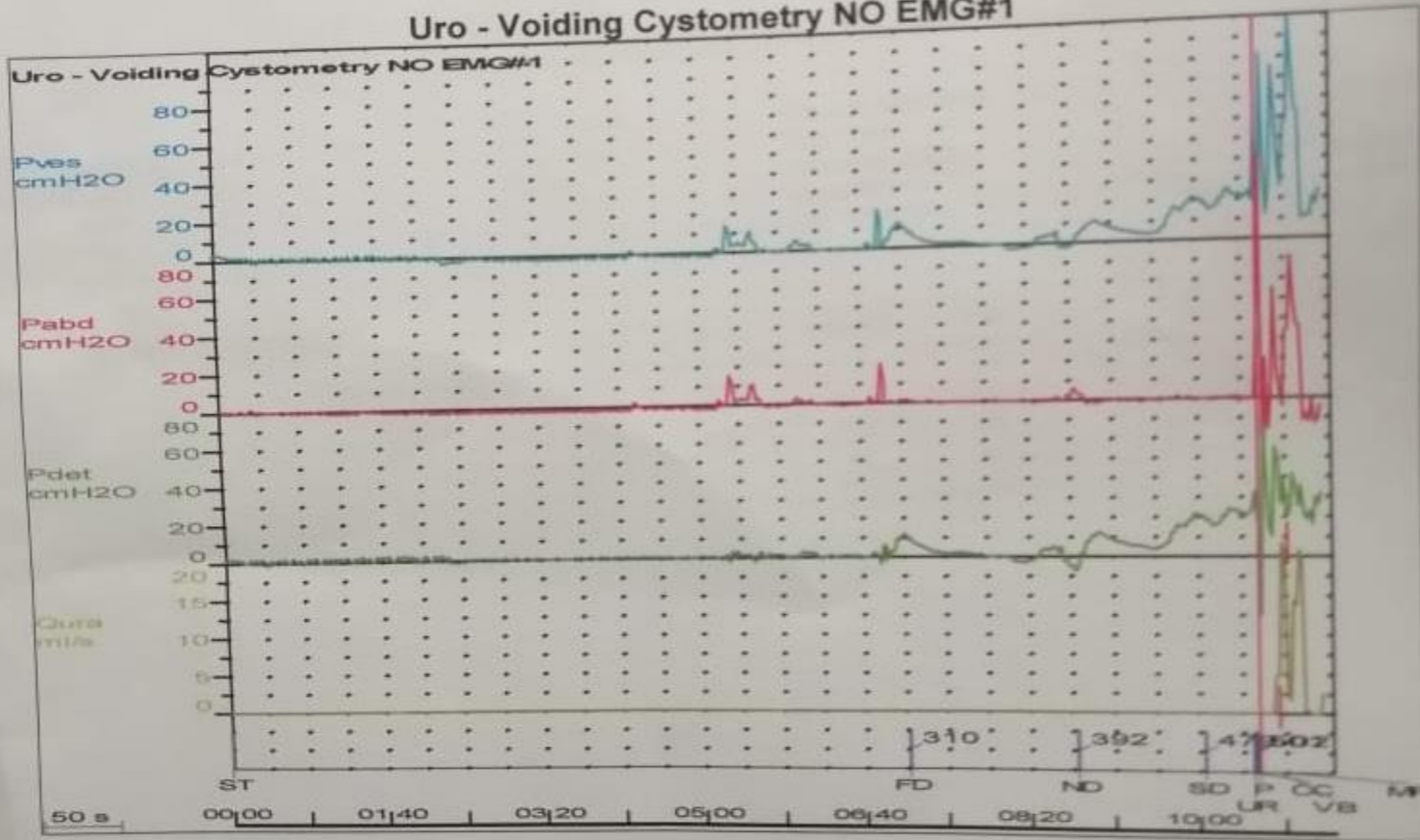
- IT IS THE DYNAMIC STUDY OF THE TRANSPORT ,STORAGE AND EVACUATION OF URINE (AUA)
- IT IS ONLY ONE PART OF COMPREHENSIVE EVALUATION OF LUTS.
- UDS SHOULD INCLUDE THE FOLLOWING:
  - PVR
  - UROFLOWMETRY (PRE-TEST)
  - VEDIODYNAMICS
- IN CERTAIN CONDITIONS:EMG, URETHRAL FUNCTION TEST ABDOMENAL PRESSURE LEAK POINT, URETHRAL PRESSURE PROFILE, MAX URETHRAL CLOSURE PRESSURE...



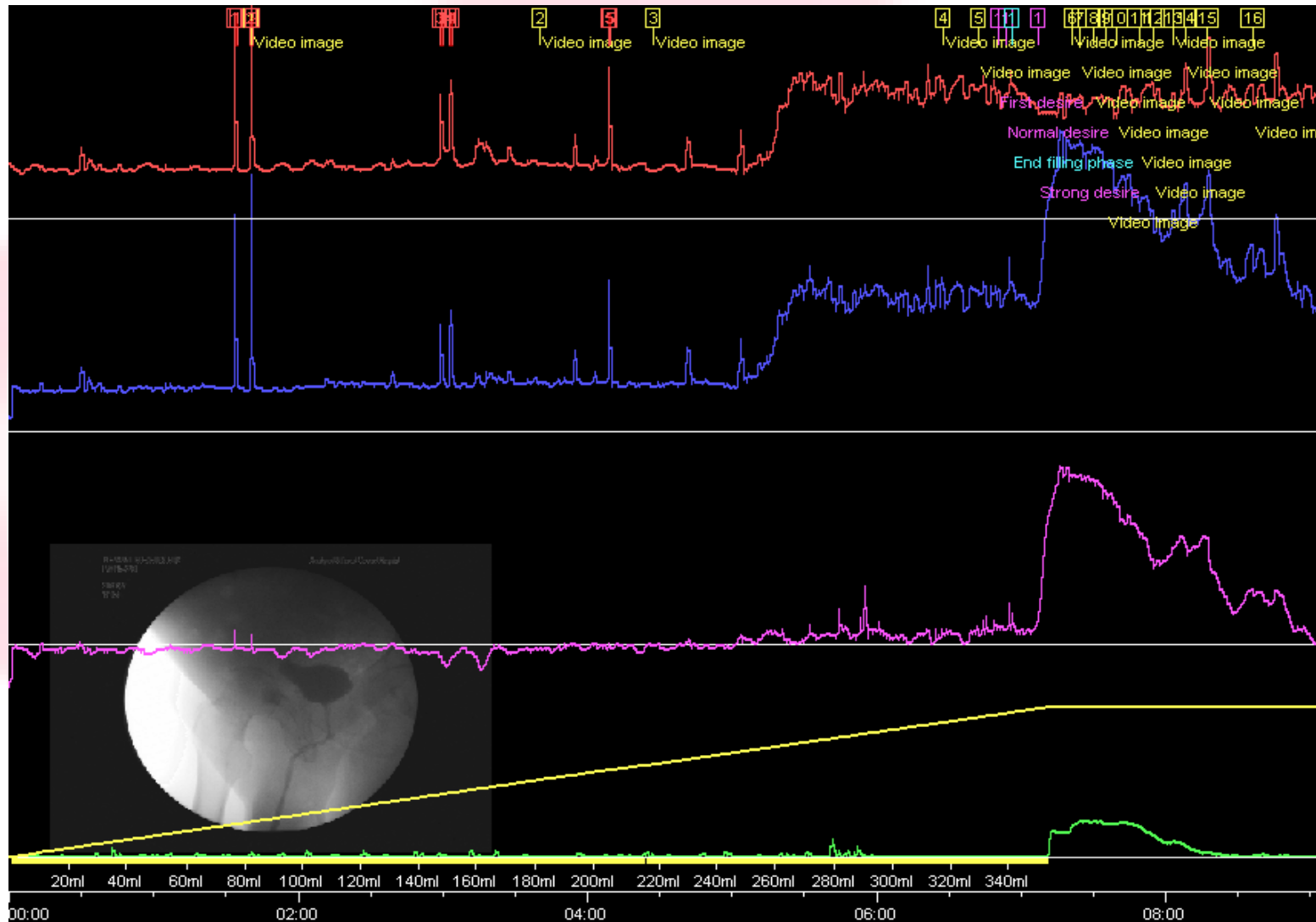


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## Uro - Voiding Cystometry NO EMG#1

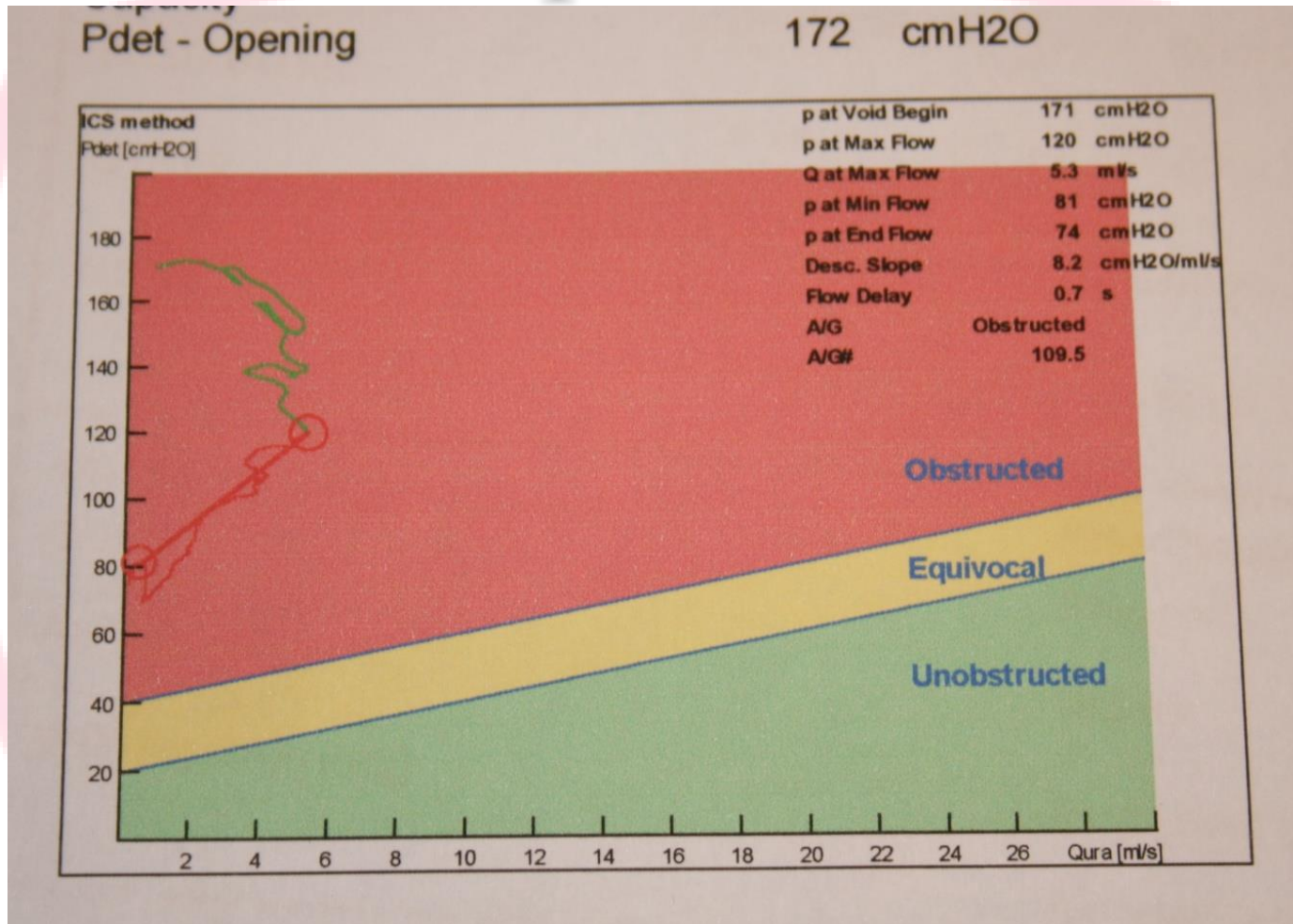


# Video urodynamics for BOO



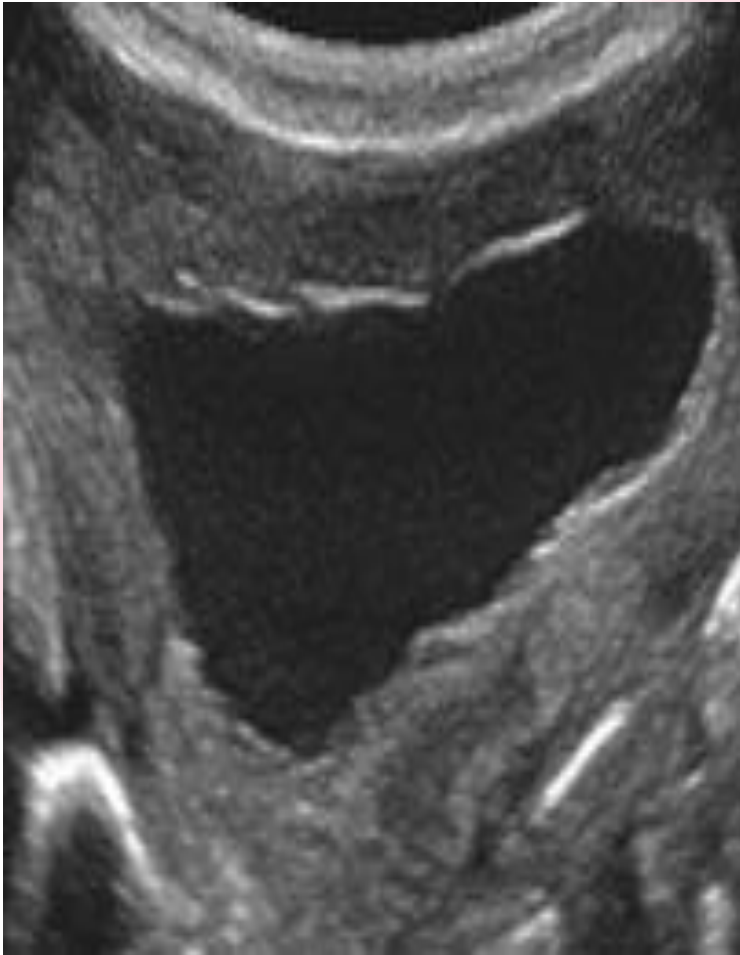


# Example pressure-flow plot

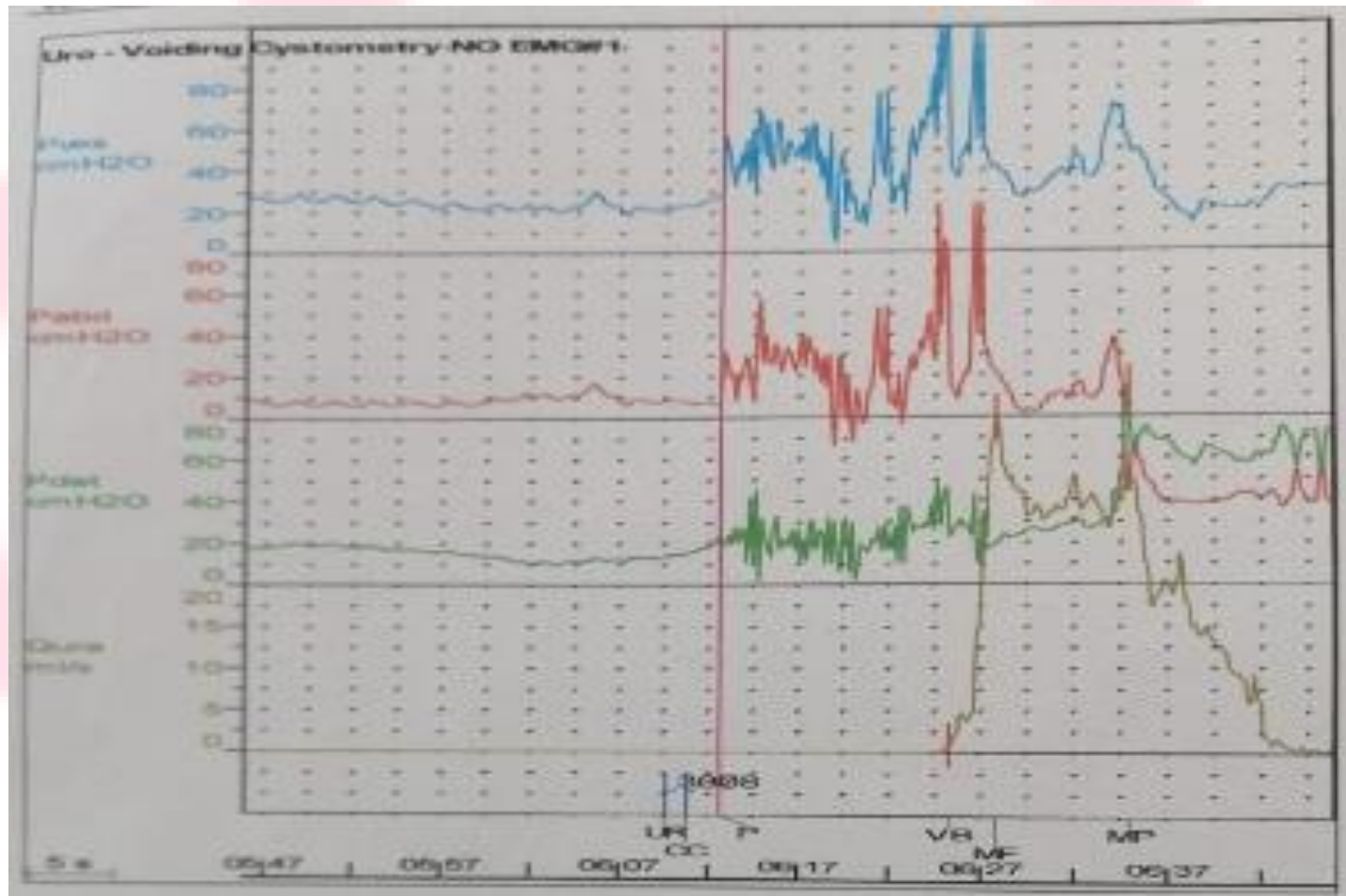


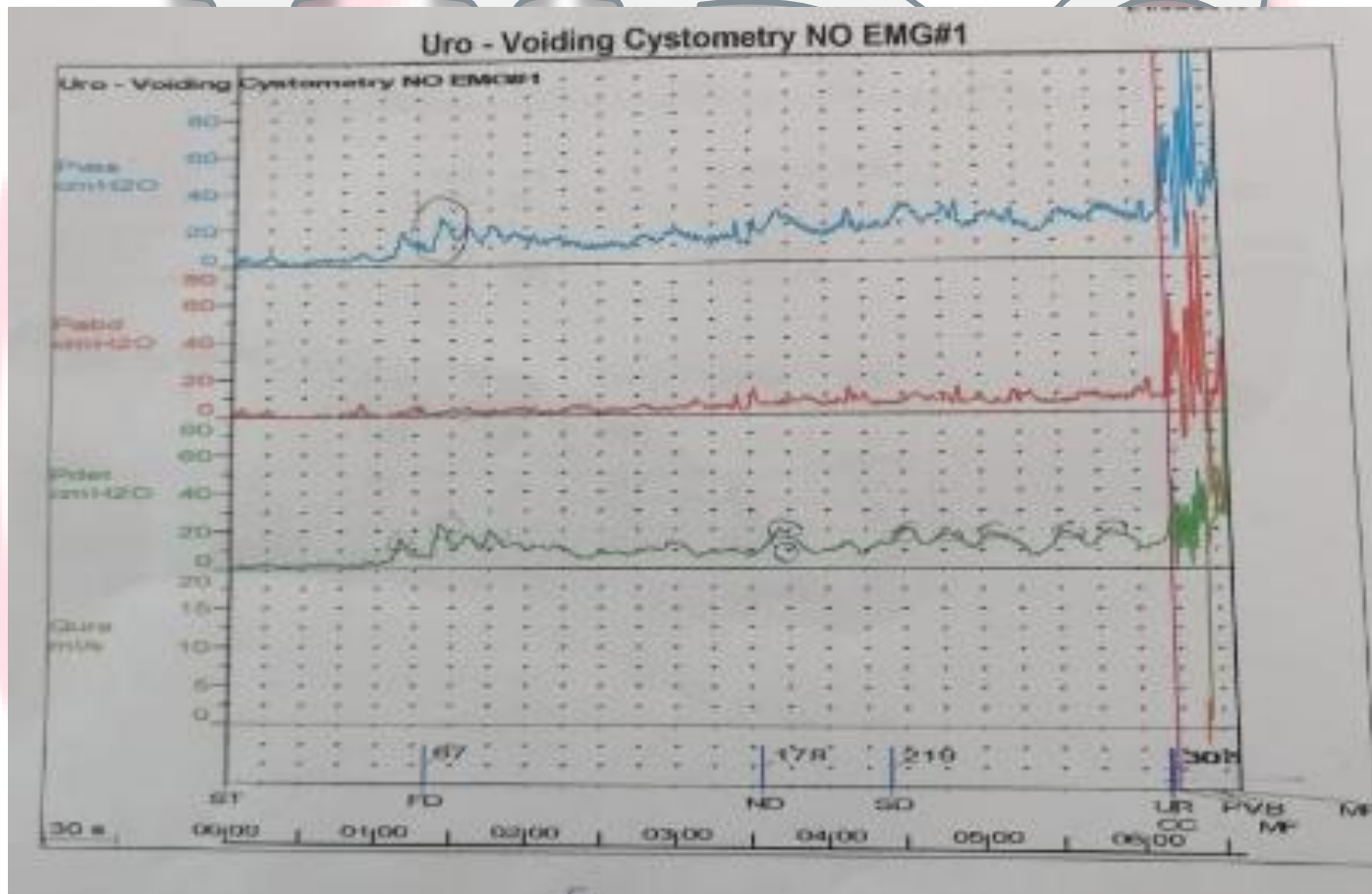
# Promising less invasive alternatives to detect or exclude BOO

- Ultrasound-derived measurements
  - Bladder/detrusor wall thickness & estimated bladder weight
    - Detect bladder wall hypertrophy, as marker of BOO or DO
    - No consensus for reference ranges or standardised methodology to date
  - Intravesical prostatic protrusion
    - Prostate median lobe can increase bladder outlet resistance by causing BOO
- Isovolumetric bladder pressure
  - Condom catheter method & penile cuff test
  - Similarities to urodynamics: dissociation BOO from detrusor underactivity
- BUT urodynamics still required to obtain detailed info about bladder function/dysfunction during filling and voiding

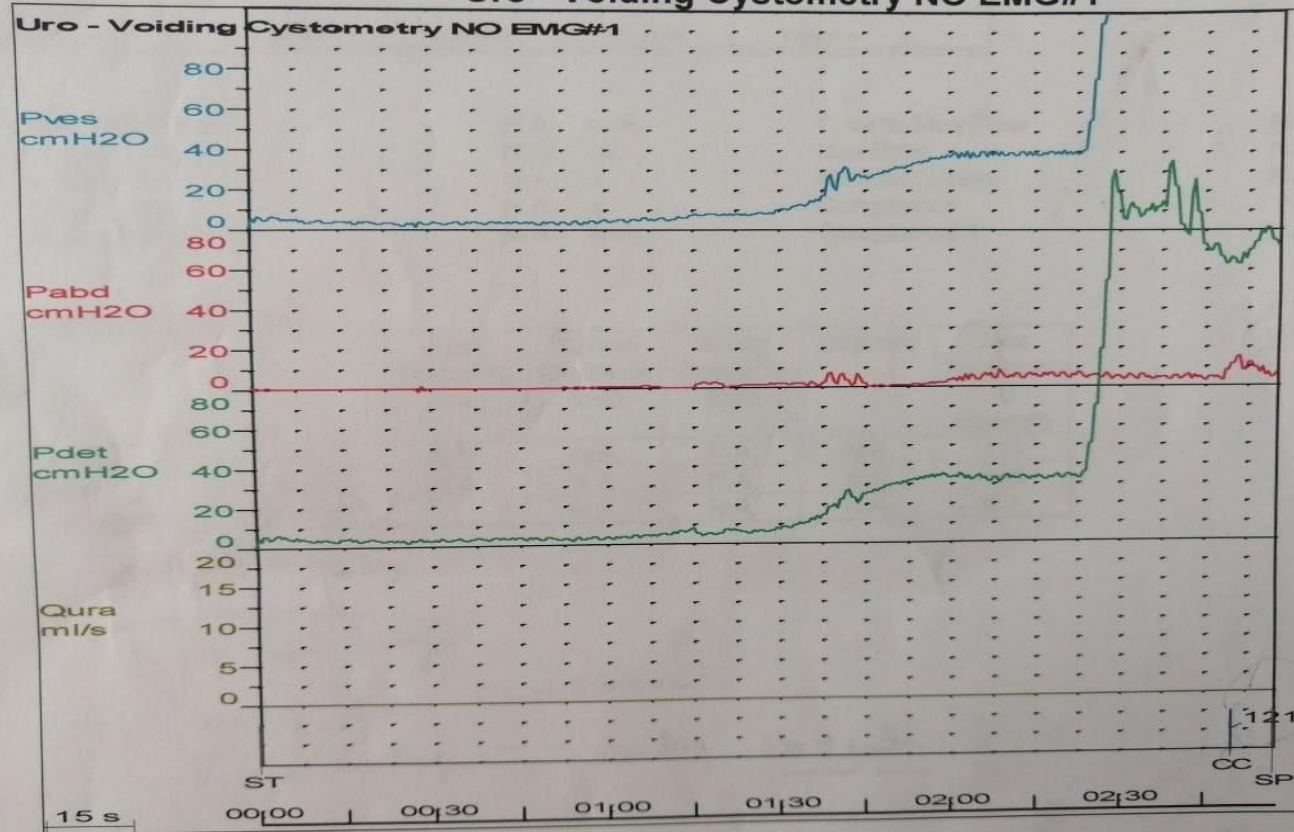




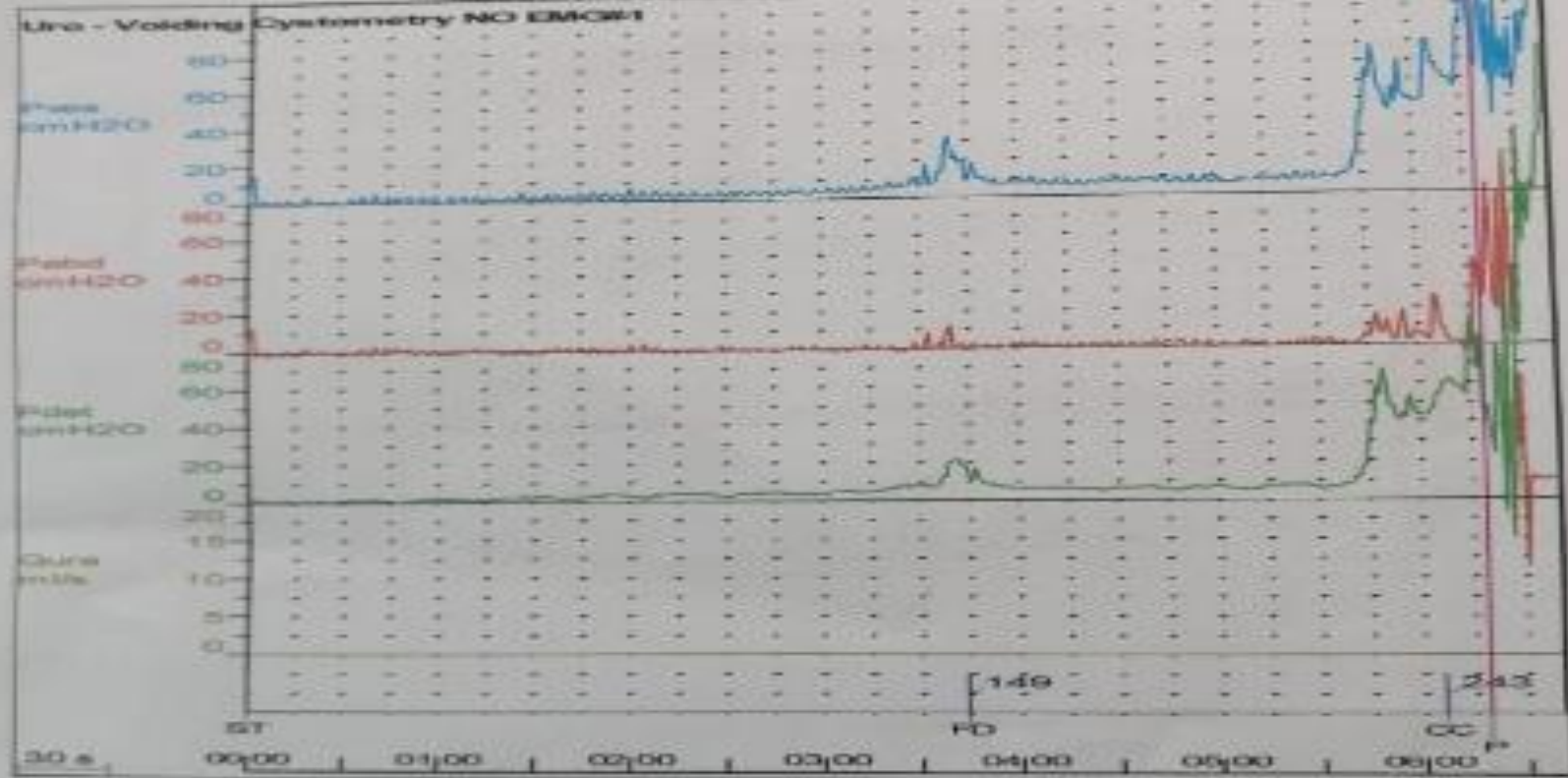




# Uro - Voiding Cystometry NO EMG#1



# Uro - Voiding Cystometry NO EMG#1



# Conclusions diagnosis

- Differentiate patients based on symptoms
- Initial evaluation to start treatment:
  - Physical exam, DRE, medical history, urinalysis, IPSS, frequency-volume chart
  - If accessible during consultation:
    - Ultrasound: PVR
    - Uroflowmetry:  $Q_{\max}$
- Specialised evaluation when symptoms persist or in case of complicated LUTS
  - Other validated questionnaires for storage/voiding
  - Ultrasound prostate/upper urinary tract
  - Endoscopy of LUT
  - Urodynamics?




Treatment

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# Watchful waiting / behavioural treatment is a viable option for many men with LUTS

- **IF** mild-to-moderate, uncomplicated LUTS (causing no serious health threat)  
**AND** not too bothered by symptoms
  - Components of watchful waiting:
    - Educate the pt , reassurance
    - periodic monitoring
    - **lifestyle advice** e.g. reduction of fluid intake at specific times, avoidance of caffeine or alcohol, reviewing medication,...
- 
- Minor changes in lifestyle and behaviour can have a beneficial effect on symptoms and may prevent deterioration requiring medical or surgical treatment

# Pharmacological treatment options

- $\alpha_1$ -AR antagonists
- 5-ARIs
- Muscarinic receptor antagonists
- Phytotherapy (no recommendations)
- Vasopressin analogues (licensed only for nocturia)
- Combination drug treatment
- New drugs e.g. PDE-5 inhibitors (experimental: licensed only for erectile dysfunction and pulmonary artery hypertension)



# Question

- With which statement do you agree the most?
  1. “Because many men with LUTS are sufficiently helped with an  $\alpha_1$ -AR antagonist, it is most efficient to start with this type of pharmacological treatment (regardless of symptoms' category)”
  2. “Differentiating treatment based on patients' symptom profile is the best management strategy because a substantial number of men with mixed or predominant storage symptoms are not responding to  $\alpha_1$ -AR antagonist treatment”

# Pharmacological management of male

## LUTS

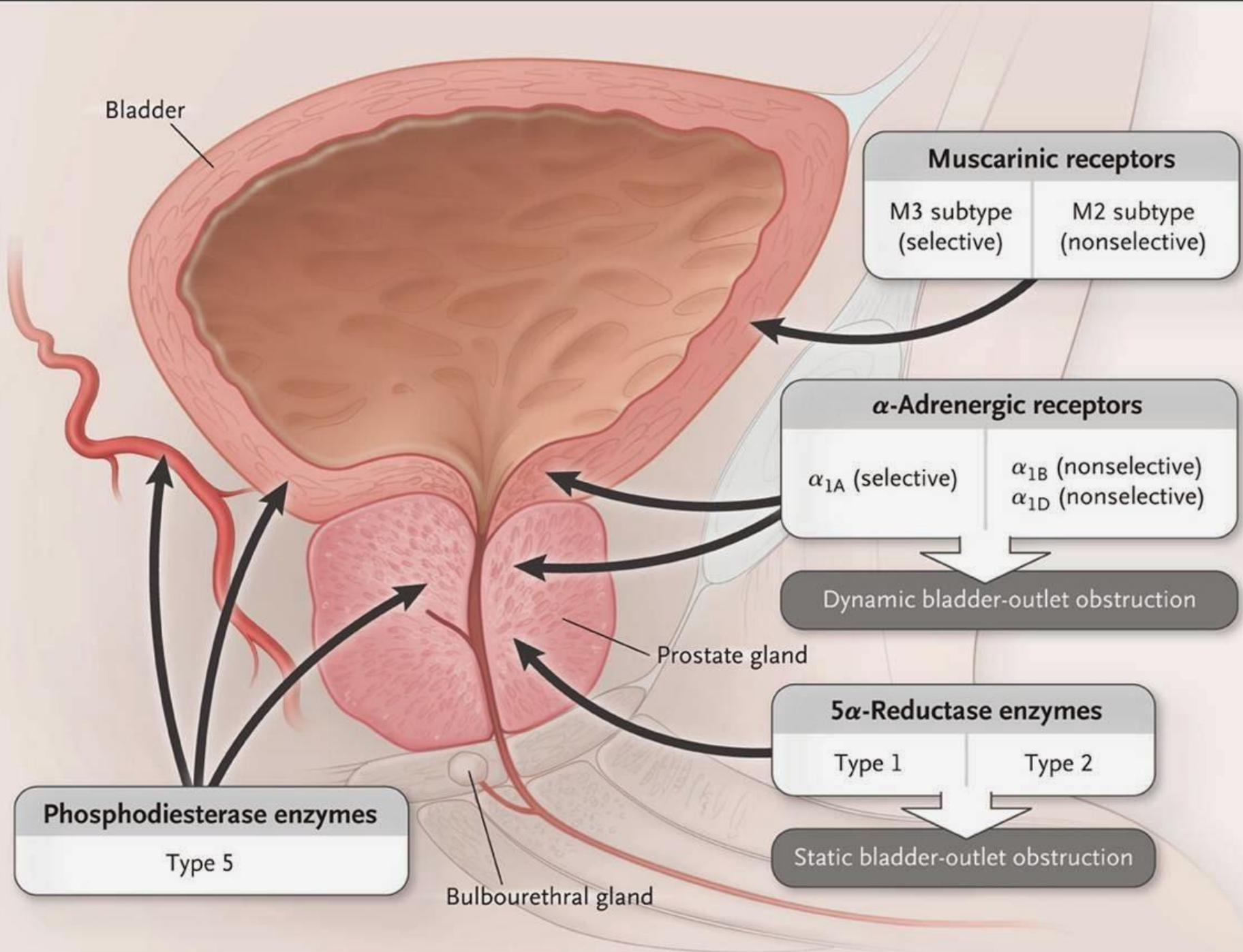
Male LUTS

Predominant  
voiding LUTS

Voiding + storage  
LUTS

Predominant  
storage LUTS

Which treatment is recommended?



# Indications for surgical treatment

- Bothersome LUTS due to BPO, refractory to medical therapy
- Complications of BPH that are considered strong indications for surgery
  - Refractory urinary retention
  - Recurrent urinary infection
  - Renal insufficiency
  - Recurrent haematuria refractory to treatment with 5-ARI
  - Bladder stones
  - Increased PVR (limit requiring surgery not clearly defined)

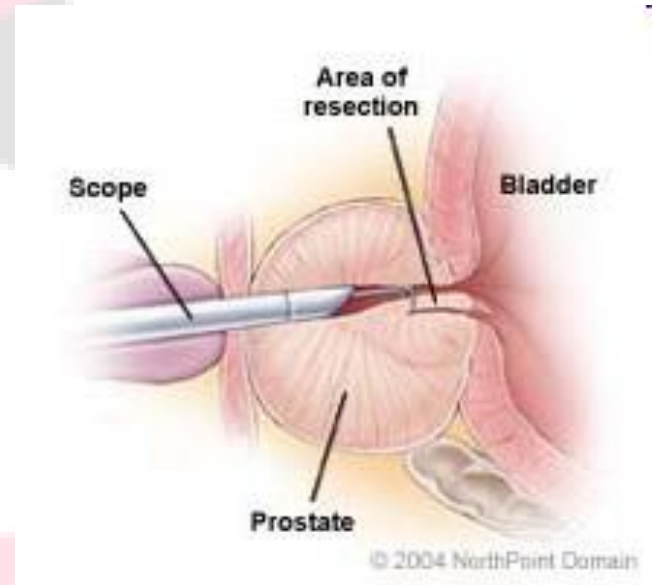
# Minimally invasive/surgical treatment options

- Surgery:
  - Open prostatectomy
  - Transurethral resection of prostate (TURP)
  - Transurethral incision of the prostate (TUIP)
- Minimally Invasive Surgical Treatment (MIST):
  - Transurethral needle ablation (TUNA)
  - Transurethral microwave thermotherapy (TUMT)
  - Lasers: holmium laser enucleation of the prostate (HoLEP) and 532 nm Greenlight laser vaporisation of the prostate (LVP)
  - (Intraprostatic ethanol injections)\*
  - (Intraprostatic botulinum toxin injections)\*

\* experimental

# TURP is still “gold standard”

- For men with prostate volumes of 30-80 mL
  - improvement rates >> medical therapy or MIST
  - morbidity >> TUIP, medical therapy or MIST



# Alternatives to TURP

TURP is still “gold standard”



## Requirements of alternatives

- Comparable efficacy and durability to TURP
- Reduced length of hospital stay
- Fewer complications
- Less costly

# HoLEP compared to TURP

+

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- Shorter catheterisation time and hospital stay
- Similar long-term complication rate
- Similar efficacy
- Prostate size-independent
- Significant learning curve
- High costs of HoLEP instruments
- Longer operating time



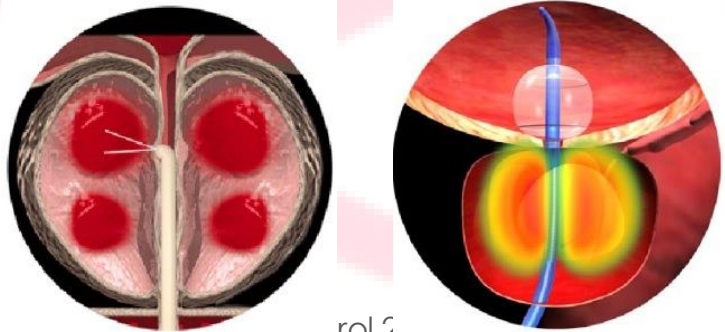
# MIST: TUNA, TUMT compared to TURP

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- Can be performed as outpatient procedure
- Less anaesthetic requirements
- Less associated morbidity

-

- TUMT: lower flow improvement
- TUNA: less symptom/QoL improvement
- Higher re-operation rate



# Botulinum toxin A injections

- Still experimental: various BTX-A products/doses/dilutions, intra-prostatic injection techniques, anaesthetic methods, study designs, duration (12-120 weeks)
- Refractory patients with BPH or patients acute or chronic urinary retention

	All studies (N=11; 324 patients)	2 randomised trials of 52 weeks (N=60)
IPSS	↓ 39-79%	↓ 51 and 62%
Q <sub>max</sub>	↑ 24-122%	↑ 24 and 85%
Prostate volume	↓ 11-61%	↓ 14 and 61%
PVR	+23% to -88%*	+23% and -88%

\*reduction in all but 1 study (only significant in half of the studies)

BUT what about long-term effects and durability?

# Conclusions surgery for BPO

- First-line treatment:
  - Gold standard: monopolar TURP if prostate volume PV 30-80 mL
  - TUIP if PV < 30 mL and without middle lobe
  - Open prostatectomy if PV > 80-100 mL and in absence of Holmium lasers
  - HoLEP as alternative to TURP and open prostatectomy
  - Resum :transurethral water vapour therapy.
- TUNA or TUMT as more tolerable but less effective/durable alternatives to TURP
- LVP as alternative to TURP with superior intra-operative safety; considerable in anti-coagulated or high cardiovascular-risk patients

# Treatment of OAB – Behavioral interventions

## Pelvic floor muscle exercises:

- Kegel exercises strengthen the pelvic floor muscle and urinary sphincter and this can help the bladder involuntary contractions.(6-8 weeks to notice the results)

## Healthy weight:

- losing weight can help to decrease stress urinary incontinence.

## Fluid consumption

- By timing of fluid consumption.

## Double voiding

## Scheduled toilet trips

- Not to wait until urge.

## Bladder training

- By start with small delays (30 min) from the start of urge.

# Treatment of OAB - Medications

Tolterodine

Oxybutanin

Oxybutanin skin  
patch

Oxybutanin gel

Trospium

Solfenacin

Mirebegron

- They can be effective in relieving the symptoms of over active bladder and reducing the episodes of urge incontenece, but Most of these drugs can have significant side effects.

# Treatment of OAB

Bladder injections.

- Botulinum toxin A: paralyzes the DM lasts for 6-9 months

Sacral and tibial nerve stimulation.

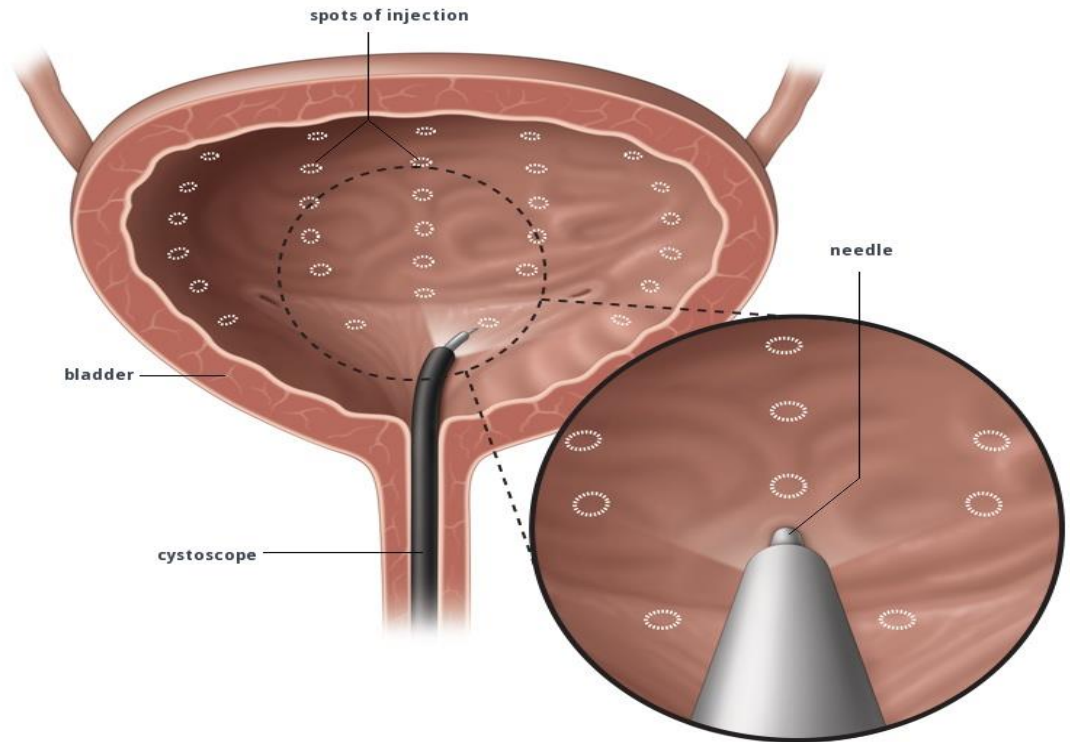
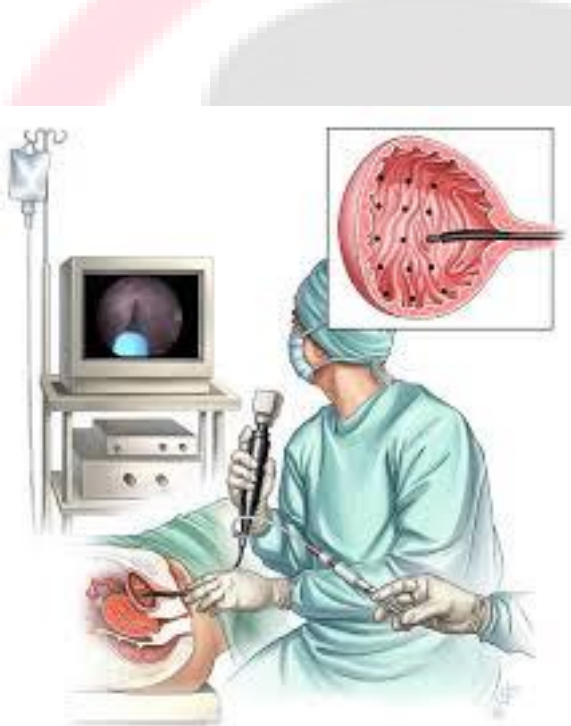
Surgery :

- Bladder augmentation
- cystectomy

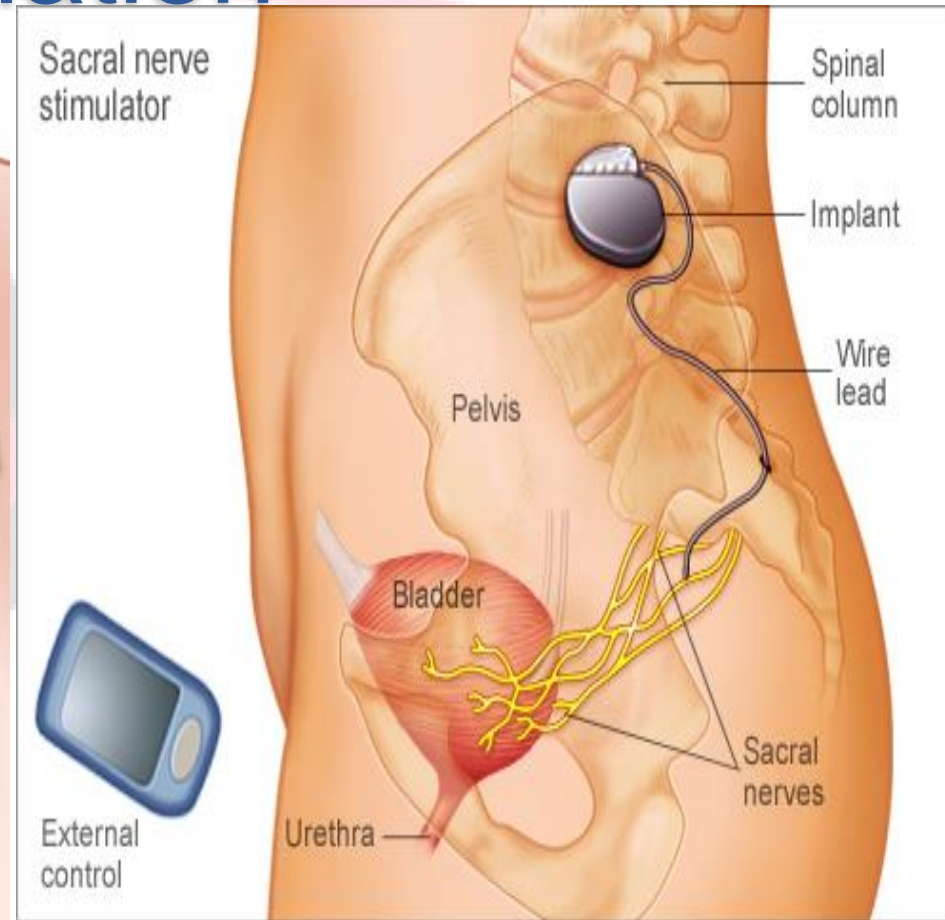
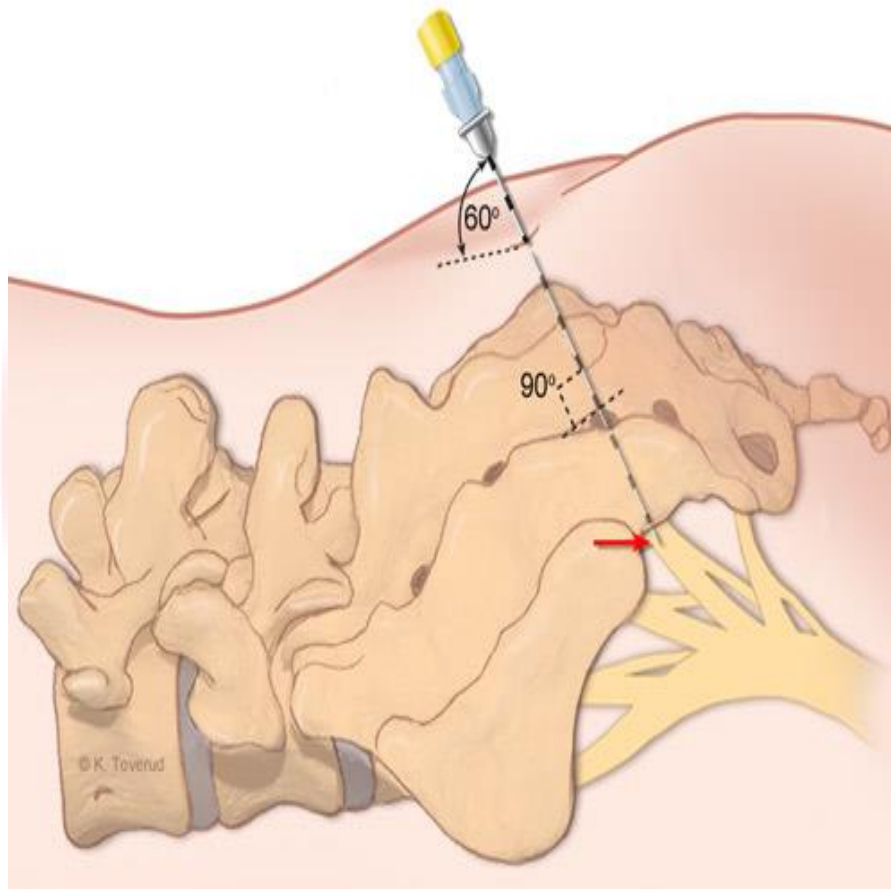
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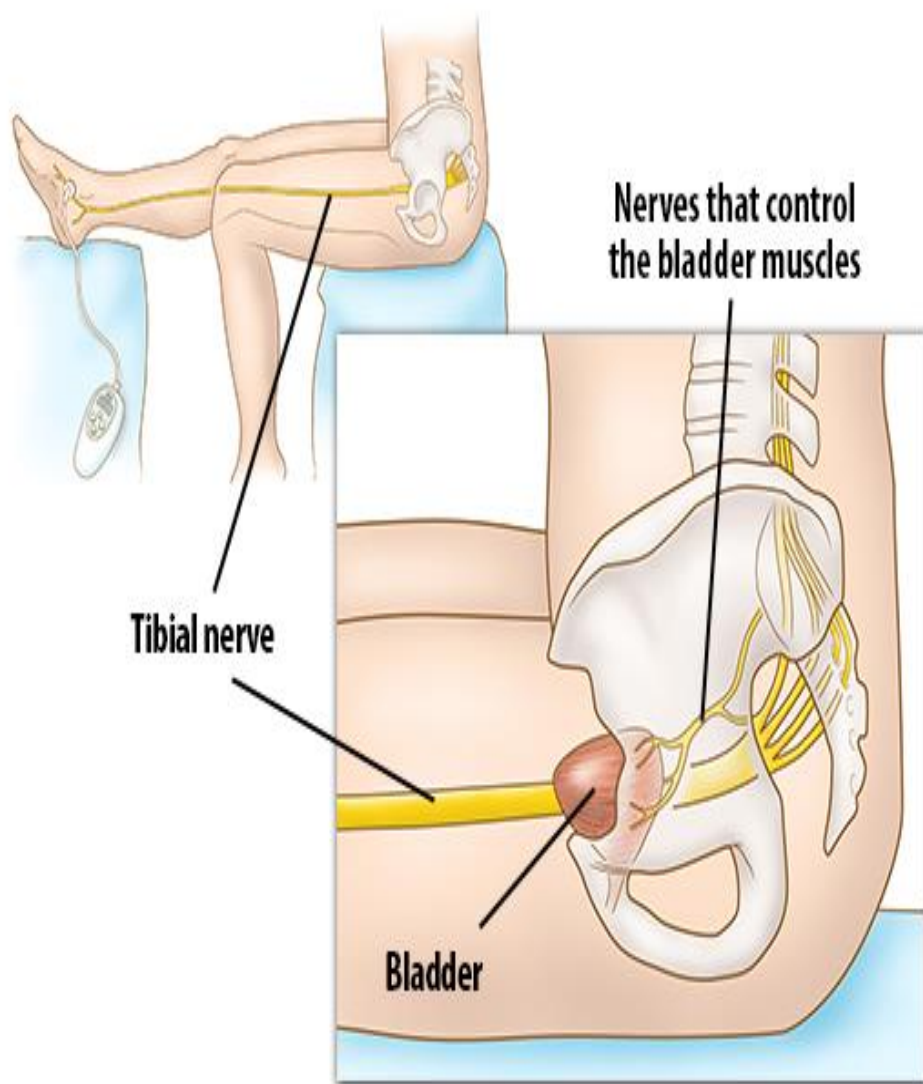
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# Sacral and tibial nerve stimulation

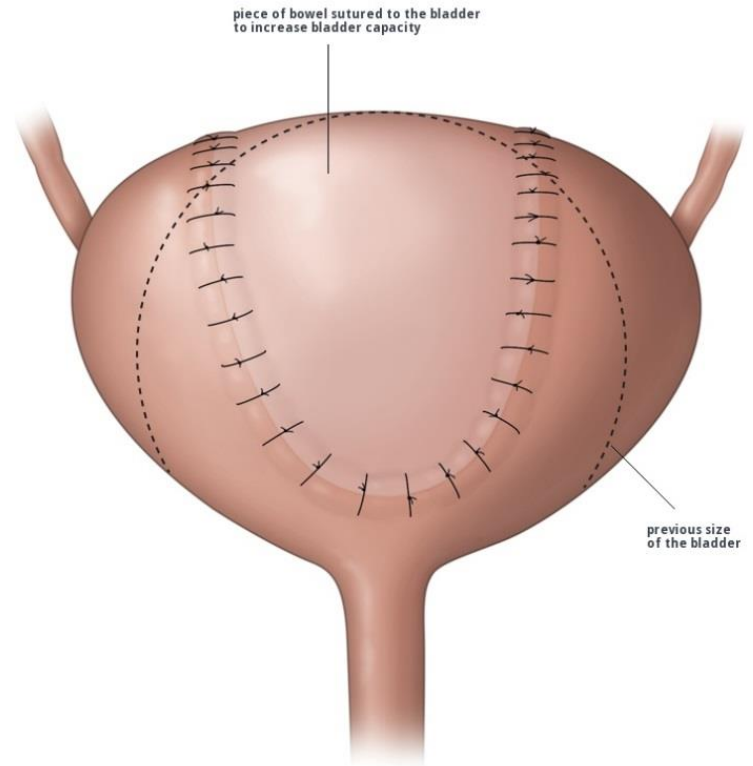
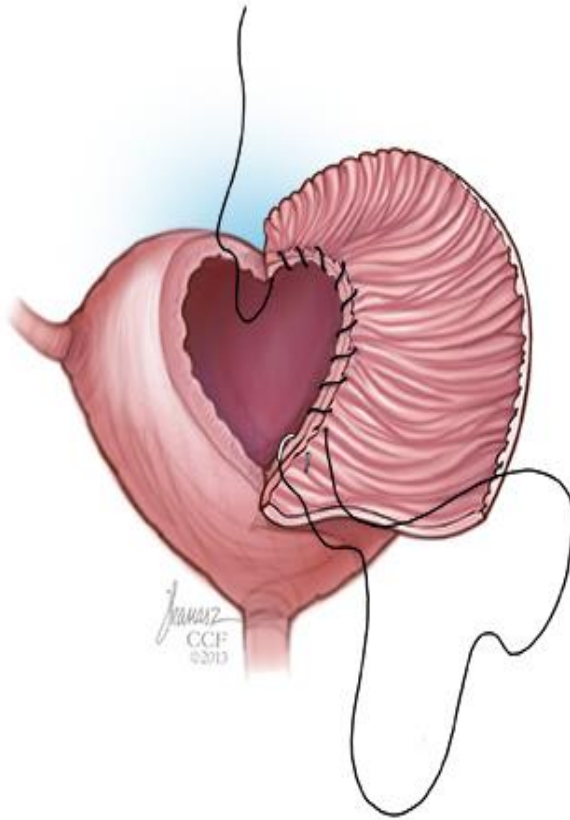






# Surgery

- **Bladder augmentation**



- **cystectomy**

