Urinary incontinence

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Objectives: by the end of this lecture, the 5th year student should be able to:

1. Define urinary incontinence
2. Summarize the types of urinary incontinence
3. Differentiate between its types by history taking
4. Demonstrate on menniquene the examination of a case with urinary incontinence
5. Predict the management option for different case presentations

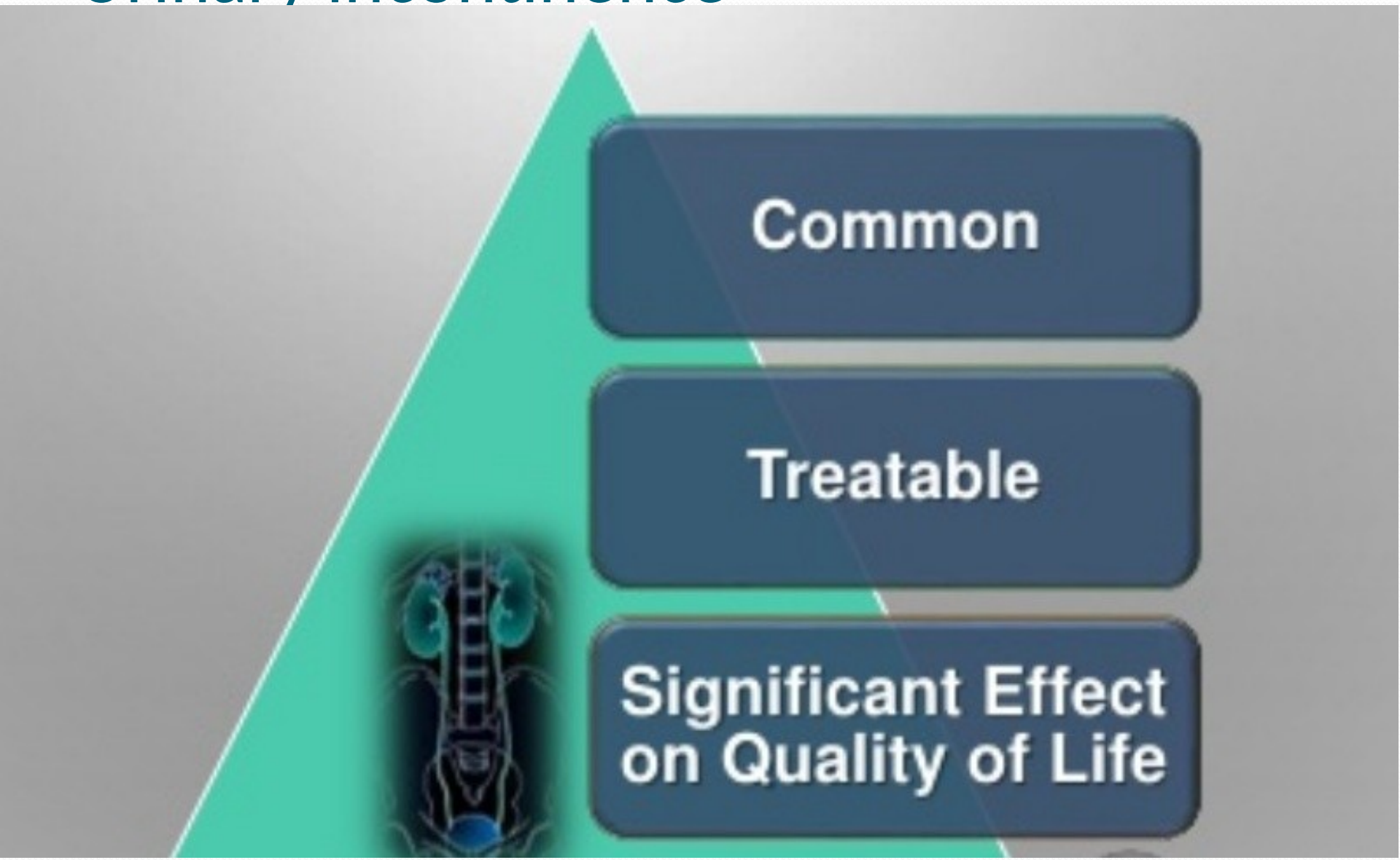
Text books Gynecology by ten teachers 20th ed. And dewhurts

?What is incontinence

Urinary incontinence is defined as the involuntary loss of urine that is objectively demonstrable and is a social or hygienic problem

The prevalence increases with age, with approximately 5 % of women below 44 years of age being affected, rising to 20 % of those older than 65 years

Urinary incontinence



Common symptoms associated with incontinence

- Stress incontinence is a symptom and a sign and means loss of urine on physical effort. It is not a diagnosis
- Urgency means a sudden desire to void.
- Urge incontinence is an involuntary loss of urine associated with a strong desire to void.

- Overflow incontinence occurs without any detrusor activity when the bladder is over-distended.
- Frequency is defined as the passing of urine seven or more times a day, or being awoken from sleep more than once a night to void

Classification of incontinence

Urethral causes

Urethral sphincter incompetence (urodynamic stress • incontinence)

Detrusor over-activity or the unstable bladder - this • is either neuropathic or non-neuropathy

Retention with overflow •

Congenital causes: Epispadias •

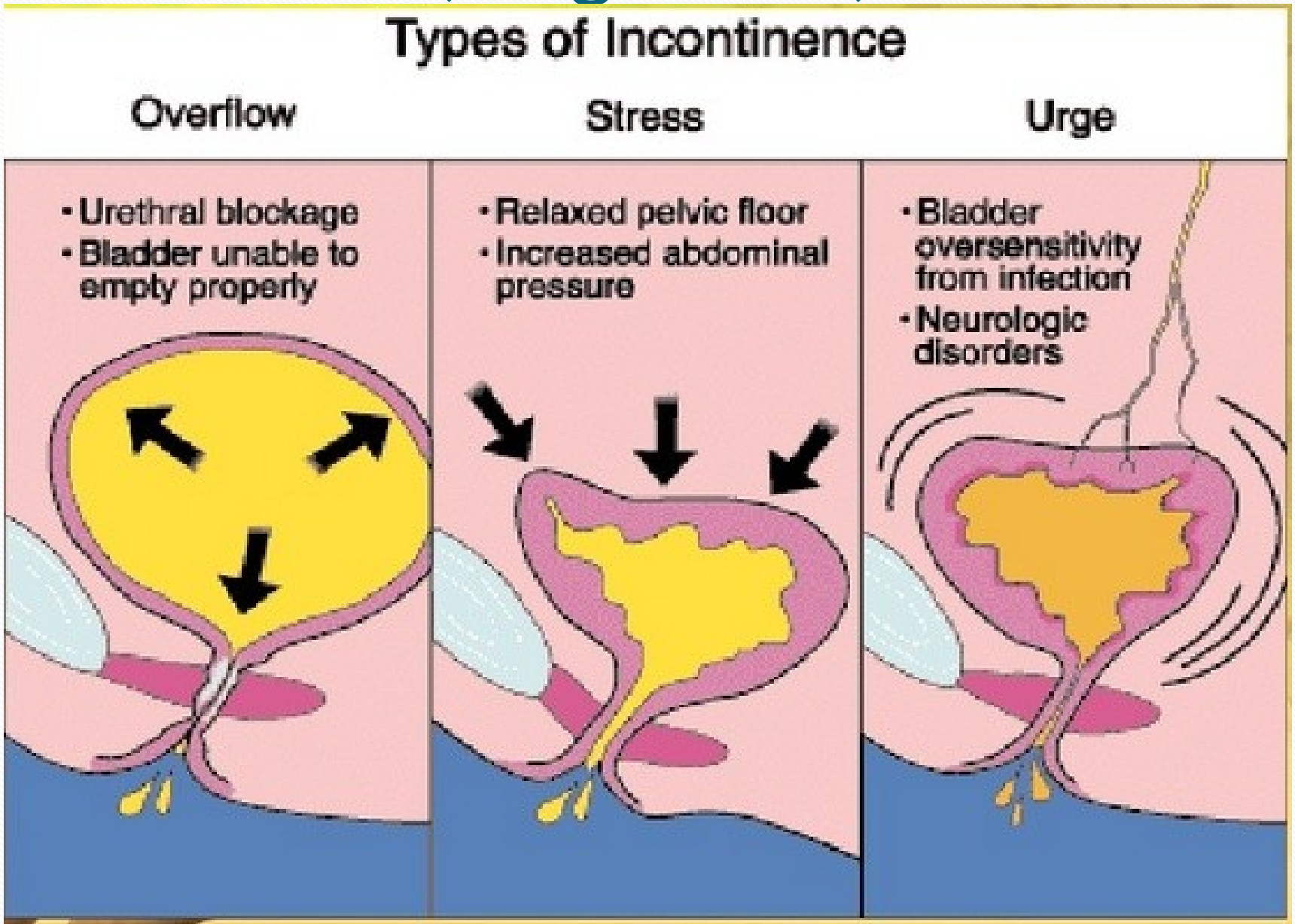
Miscellaneous •

Extra-urethral causes

Congenital causes •

Fistula •

Stress 50%, urge 20%,mixed 30%

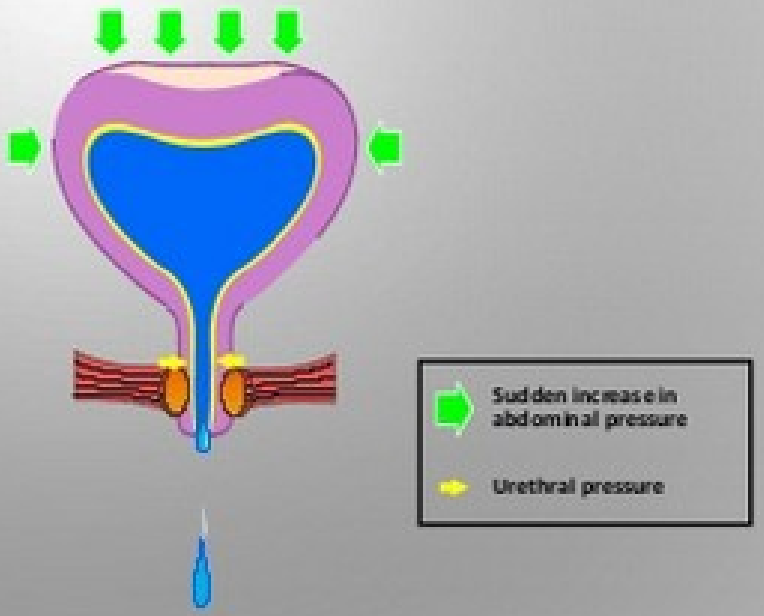


STRESS UI

-The complaint of involuntary leakage with effort or exertion or on sneezing or coughing.

-Due to either:
1-poor pelvic floor.
2-weak urethral sphincter.

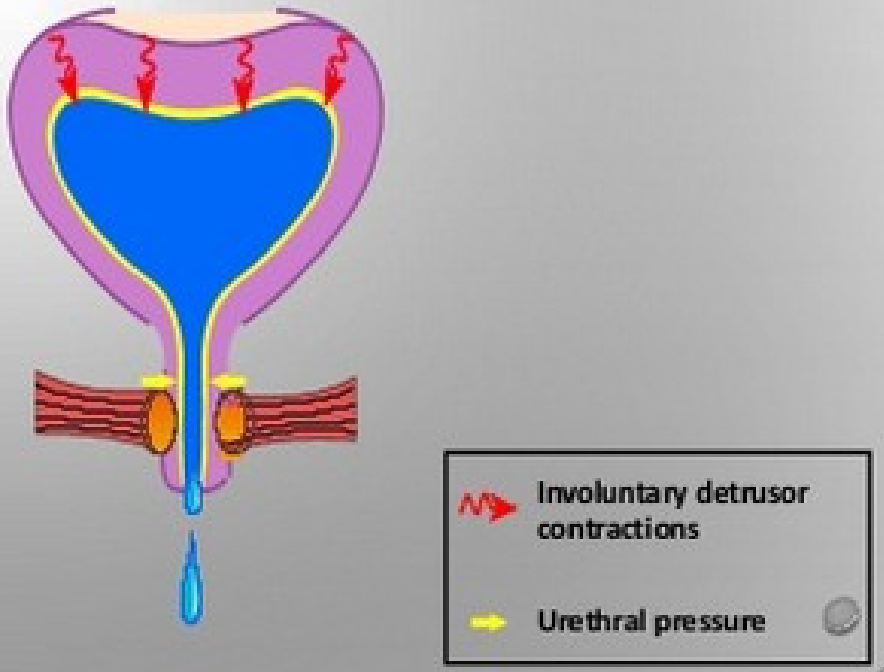
-Very common in **women**.



URGE UI

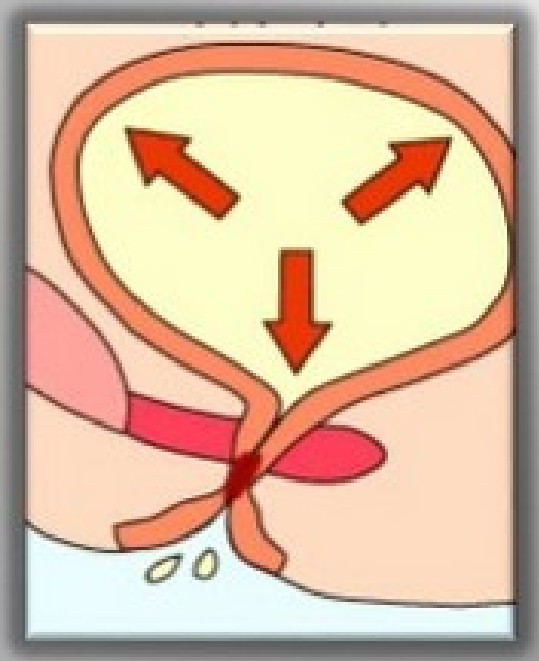
The complaint of involuntary leakage accompanied by or immediately preceded by urgency.

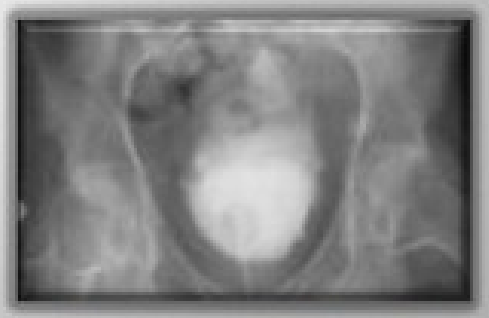
Due to over activity of detrusor muscle.



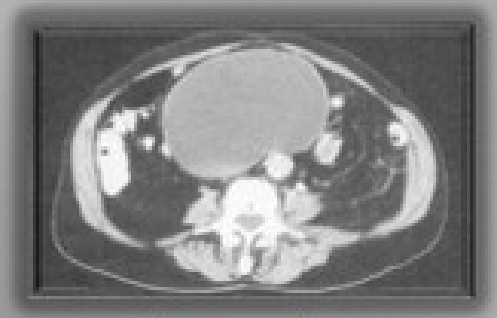
OVERFLOW

- Urethral blockage
- The Bladder is not able to empty properly





Neurogenic/Atonic

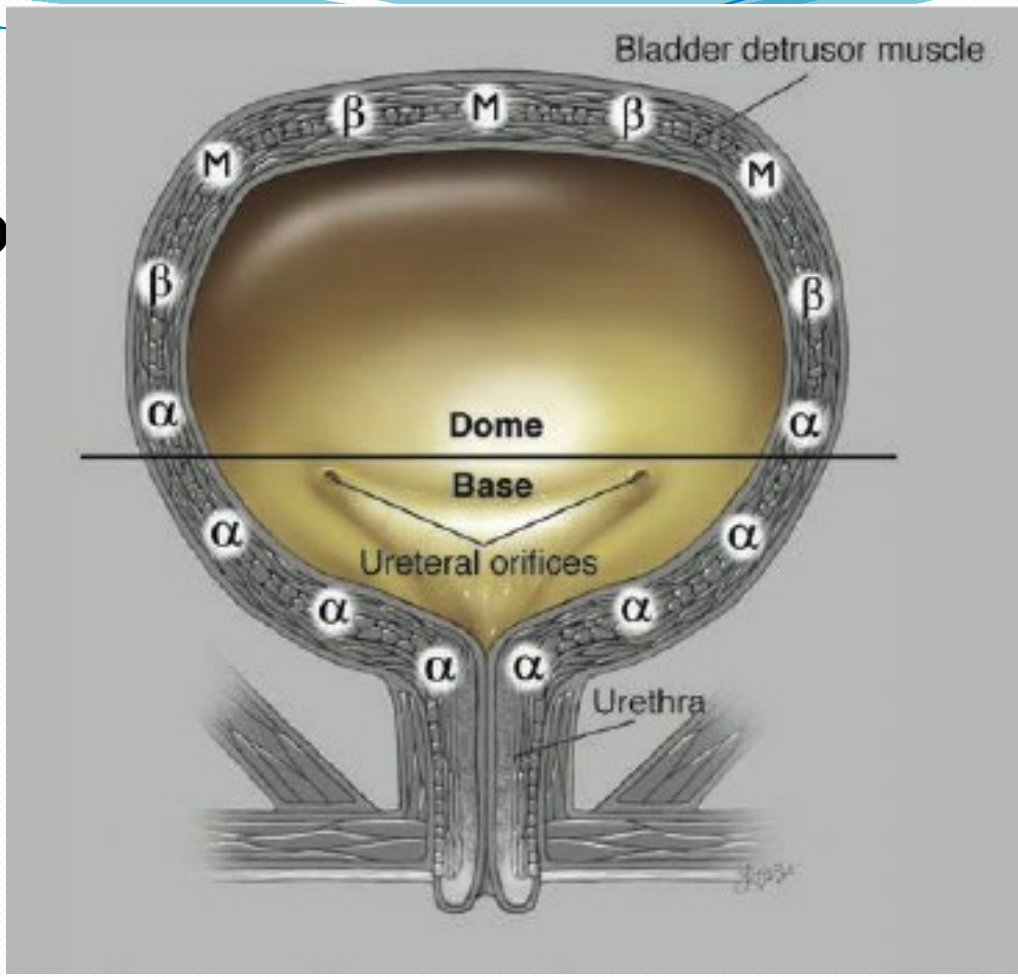


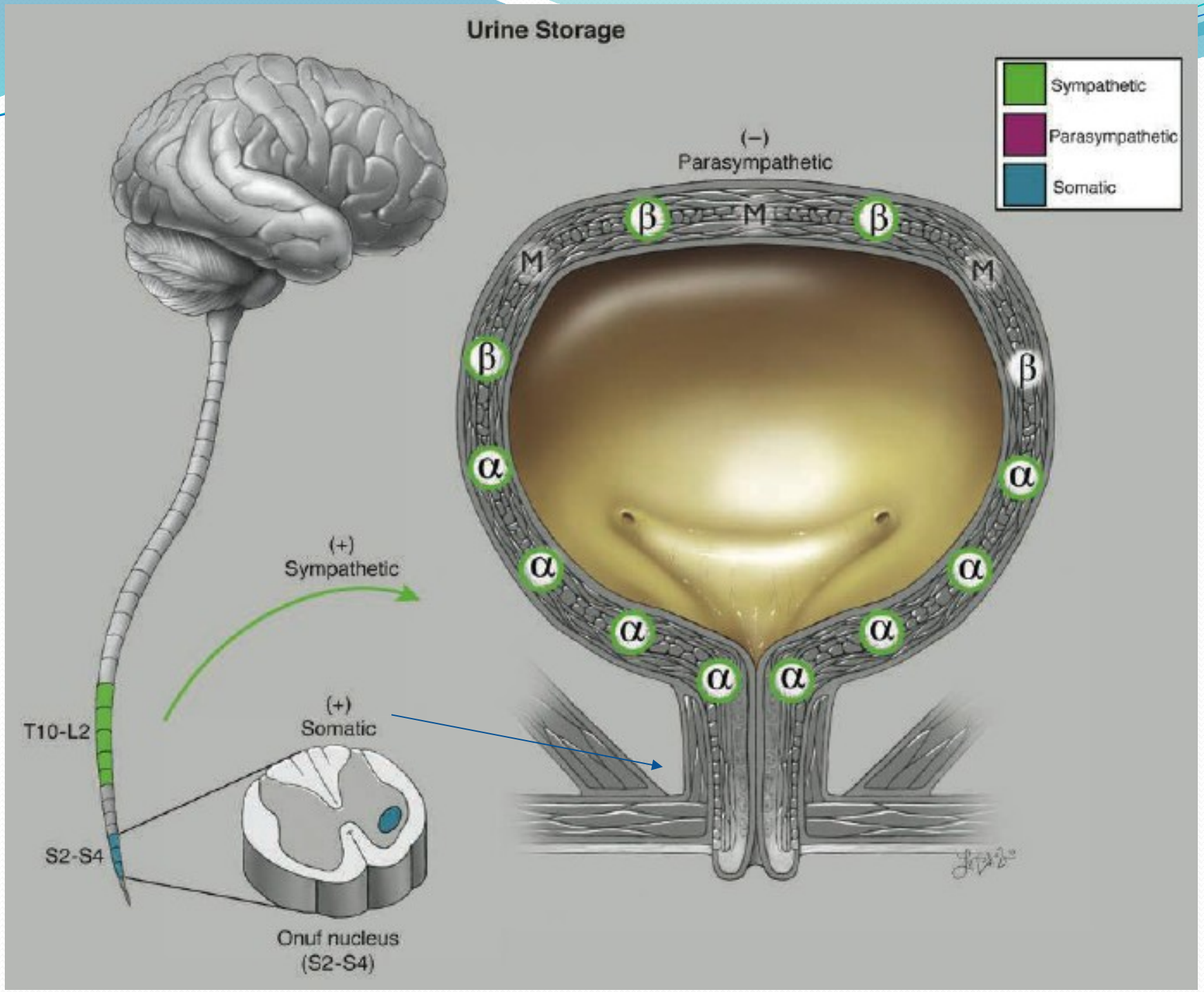
Obstruction

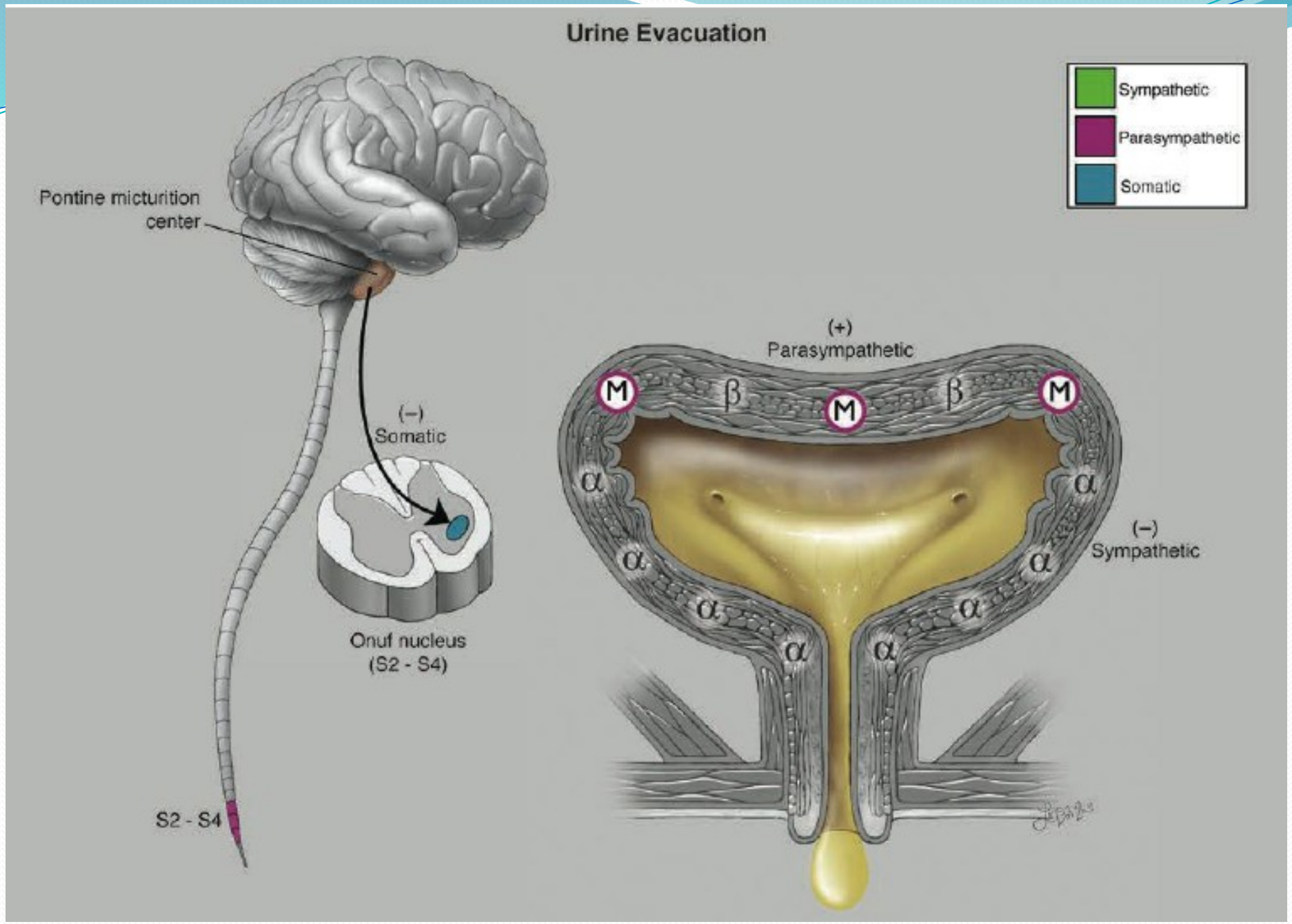
The bladder dome is rich in parasympathetic muscarinic receptors M(detrusor contraction) and sympathetic β-adrenergic .receptors β(detrusor relaxation)

The bladder neck contains a greater density of sympathetic α-adrenergic receptors α(bladder .neck constriction)

S2–S4 somatic innervation via pudendal n innervate the striated urogenital sphincter complex




Urine Storage
Sympathetic
Parasympathetic
Somatic
(−)
Parasympathetic
β
M
β
M
M
β
β
α
α
α
α
α
α
α
(+)
Sympathetic
(+)
Somatic
T10-L2
S2-S4
Onuf nucleus
(S2-S4)


Urine Evacuation
Sympathetic
Parasympathetic
Somatic
Pontine micturition center
(–) Somatic
Onuf nucleus (S2 - S4)
S2 - S4
(+) Parasympathetic
M
β
α
(–) Sympathetic

:Urodynamic stress incontinence USI

is noted during filling cystometry, and is defined as the involuntary leakage of urine during increased abdominal pressure in the absence of a detrusor contraction

AETIOLOGY

It is due to either :

- *Weakness of the internal urethral sphincter or*
- *Descent of bladder neck below the level of the pelvic floor.*

Risk Factors for stress Urinary Incontinence

.Multiparity (particularly vaginal births)

- Forceps delivery*.
- Perineal trauma.
- Long labour*.
- Epidural analgesia.
- Birthweight >4 kg.
- Increasing age.
- Postmenopause.
- Obesity studies have shown that significant weight loss among obese women is associated with major improvements in urinary leakage symptoms.
- Connective tissue disease.
- Chronic cough (e.g. bronchiectasis or chronic obstructive pulmonary disease).
- Doxazocin (alpha-adrenergic antagonist) for hypertension causes relaxation of the urethral sphincter*.

:Diagnosis

History: risk factors and symptoms, risk factors as cough, constipation, high parity and difficult deliveries

Stress incontinence is the usual symptom, but urgency,frequency and urge incontinence may be .present

.The patient may present with symptoms of prolapse

The severity of symptoms vary from mild cases where incontinence occurs with heavy exercise such as lifting heavy weight to severe cases where .incontinence develops simply on changing position

Examination

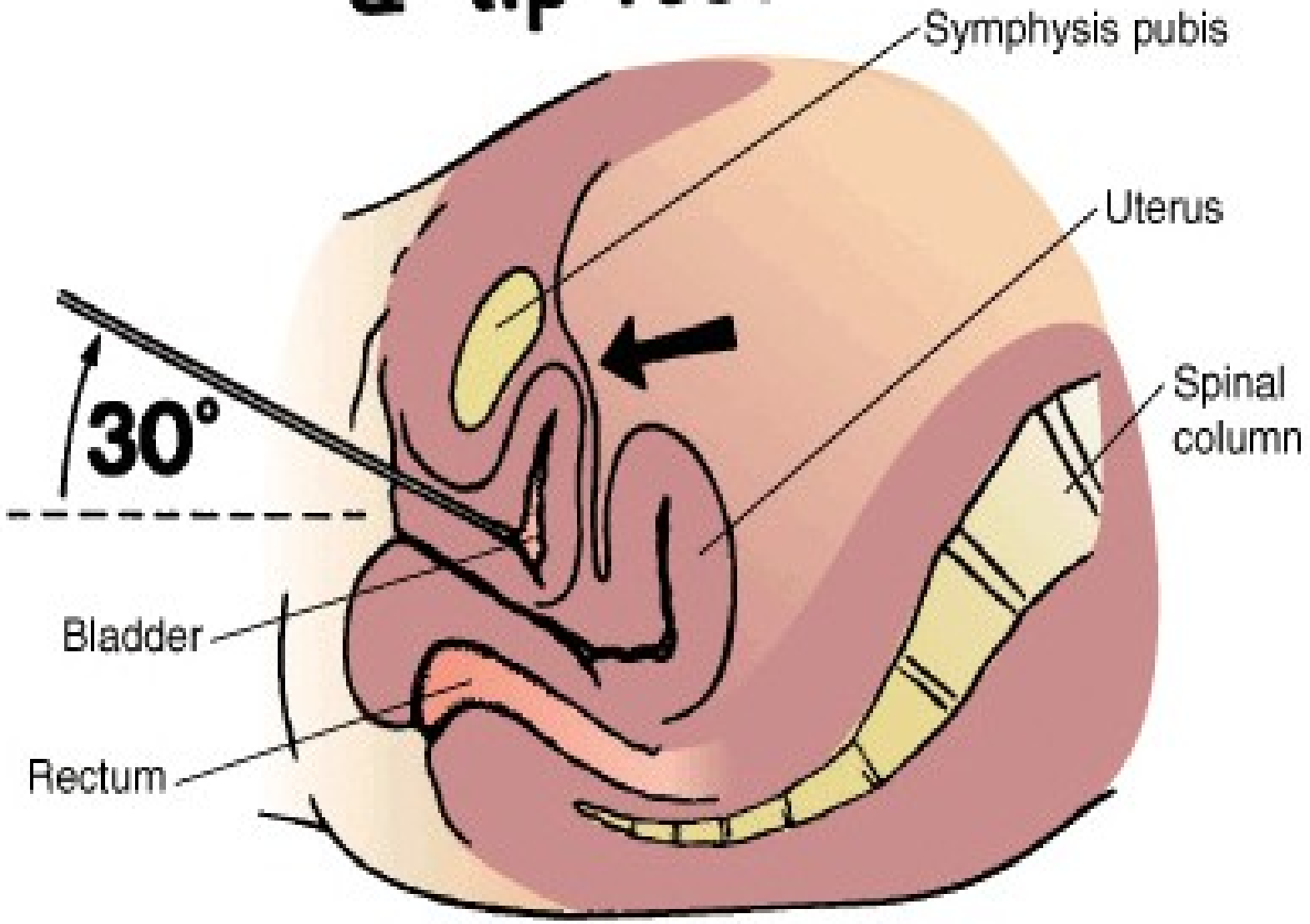
Cough test: stress incontinence may be demonstrated when the patient coughs.

Vaginal examination should assess for prolapse, atrophy, fistula and pelvic masses

:Q Tip test

A sterile swab stick is inserted into the bladder cavity. As the patient strains in continent women the angle between the horizon and the swab should not exceed 30 degree. While women with stress incontinence the angle .may reach up to 60 degree

Q-tip Test



Investigations

Mid-stream specimen of urine: to exclude-1 infection

Frequency/volume chart: (urinary or-2 bladder diary) provides an objective assessment of a patient's fluid input and urine output

Bladder Diary

Please record the time and amount of your oral intake, urine output, urine leakage, and pad changes FOR 3 DAYS

Time	Oral Intake	Voided Urine	Urine Leakage or Pad Change

Source: Schorge JO, Schaffer JI, Halvorson LM, Hoffman BL, Bradshaw KD, Cunningham FG: *Williams Gynecology*: http://www.accessmedicine.com

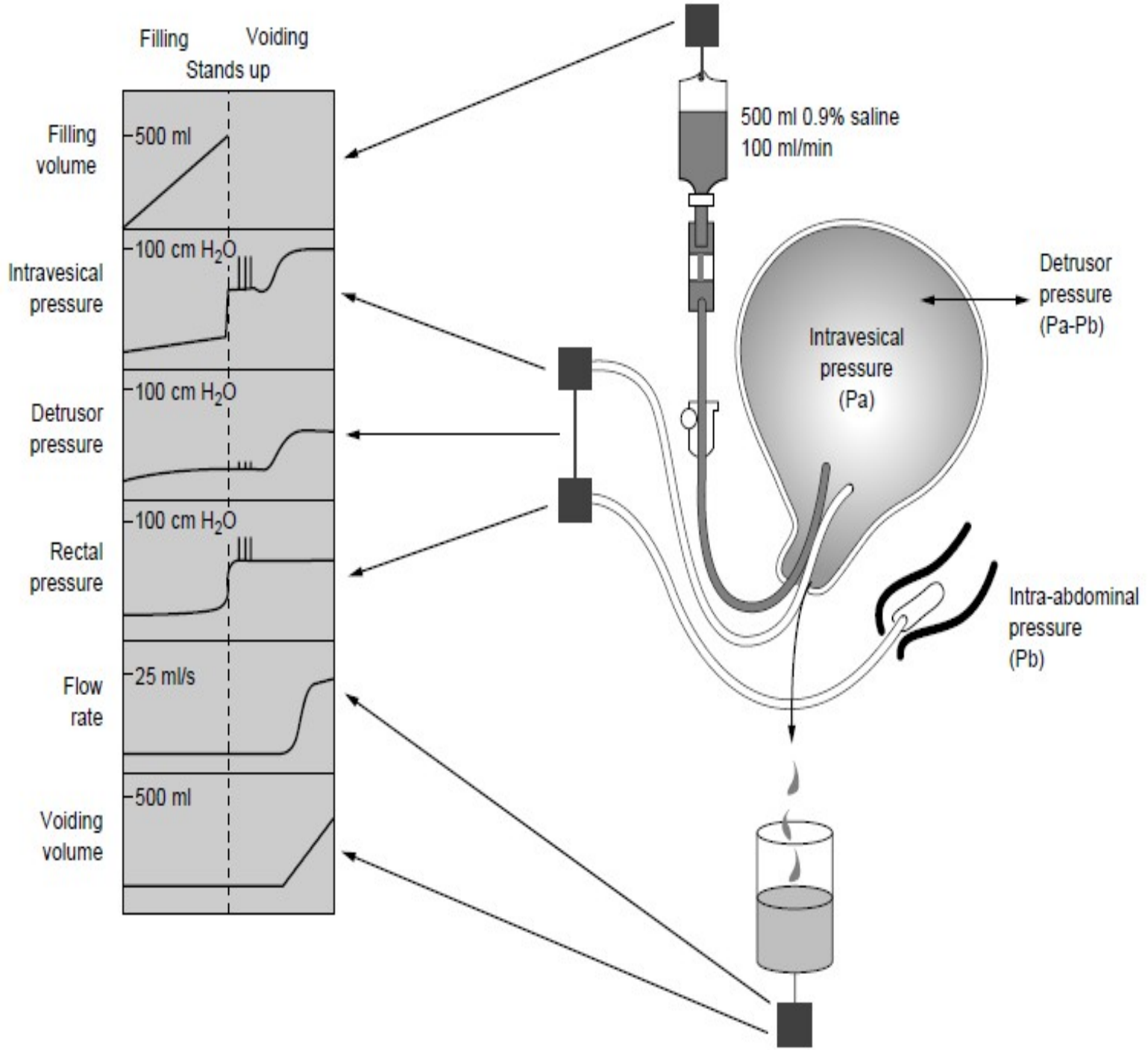
Example of a urinary diary.

Pad test: by measuring the weight gain of a-3 perineal sanitary towel

Uroflowmetry : is the measurement of urine-4 flow rate. A flow rate < 15mL \ s on more than one occasion is considered abnormal in female

Cystometry-5

involves the measurement of the pressure volume relationship of the bladder. It measures the abdominal pressure, intravesical pressure and detrusor pressure


Filling
Voiding
Stands up
Filling volume
500 ml
Intravesical pressure
100 cm H_2O
Detrusor pressure
100 cm H_2O
Rectal pressure
100 cm H_2O
Flow rate
25 ml/s
Voiding volume
500 ml
500 ml 0.9% saline
100 ml/min
Intravesical pressure (Pa)
Detrusor pressure (Pa-Pb)
Intra-abdominal pressure (Pb)

.The following are parameters of normal bladder function

- .Residual urine of < 50 mL
- .First desire to void between 150 and 200 mL
- .Capacity between 400 and 600 mL
- Detrusor pressure rise of < 15 cmH_20 during .filling and standing
- .Absence of systolic detrusor contractions
- .No leakage on coughing
- A voiding detrusor pressure rise of < 70 cmH20 with a peak flow rate of > 15 mLis for a volume > 150 mL

other investigations in selected cases like: -6 Videocystourethrography, Urethral pressure profilometry, Cystourethroscopy, Ultrasound and IVU usually performed when there is hematuria, recurrent UTI, fistula, urgency and dysurea

:Treatment of Urodynamic stress incontinence

:A. Non surgical

Simple measures :

Treatment of urinary tract infection

Restriction of fluid intake

Reduce caffeine intake

Modifying medication(e.g. diuretics)

Treating chronic cough and constipation play an important role in the management of most .types of urinary incontinence

Prevention

Shortening the second stage of delivery and reducing traumatic delivery may result in fewer women developing stress incontinence. The benefits of hormone replacement therapy have not been substantiated. The role of pelvic floor exercises either before or during .pregnancy needs to be evaluated

Conservative treatment is indicated when

,The incontinence is mild -1

The patient is medically unfit for surgery or -2

The patient does not wish to undergo an-3 operation

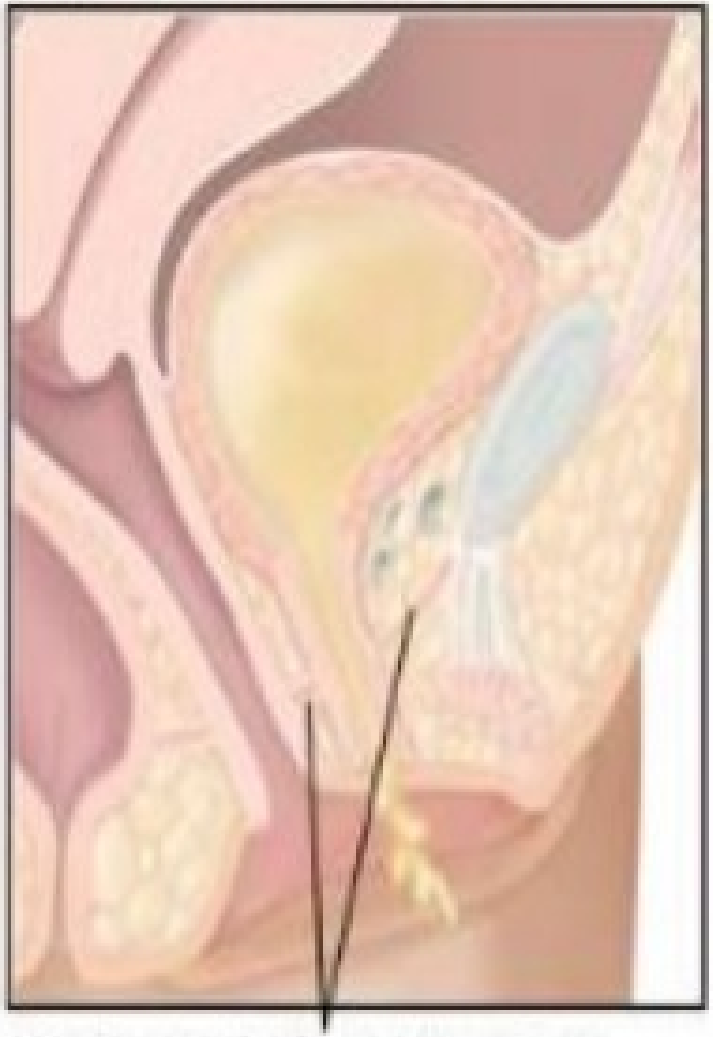
Women who have not yet completed their -4 .families

It may also be useful prior to surgery in case -5 of a long waiting list

Non pharmacological -1

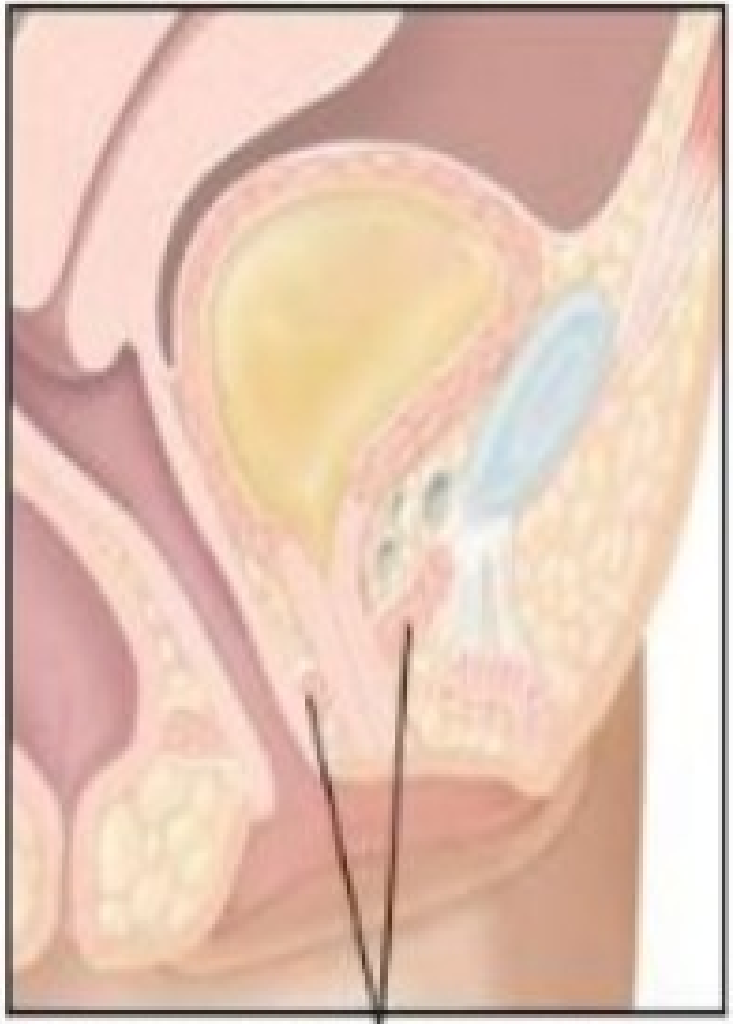
Pelvic floor muscle training : Also known -1 as *Kegel exercises,* PFMT entails voluntary contraction of the levator ani muscles. As with any muscle building, exercise sets should be performed numerous times during the day, with some reporting up to 50 or 60 times each day. The aim is to enhance the tone of levator ani muscle. 40 -60 % of cases improve with this exercise

Before Kegal excercises



Weak pelvic floor muscles

After Kegal exercises



Strong pelvic floor muscles

Perineometry-2

A perineometer is a cylindrical vaginal device which can

be used to assess the strength of pelvic floor contractions

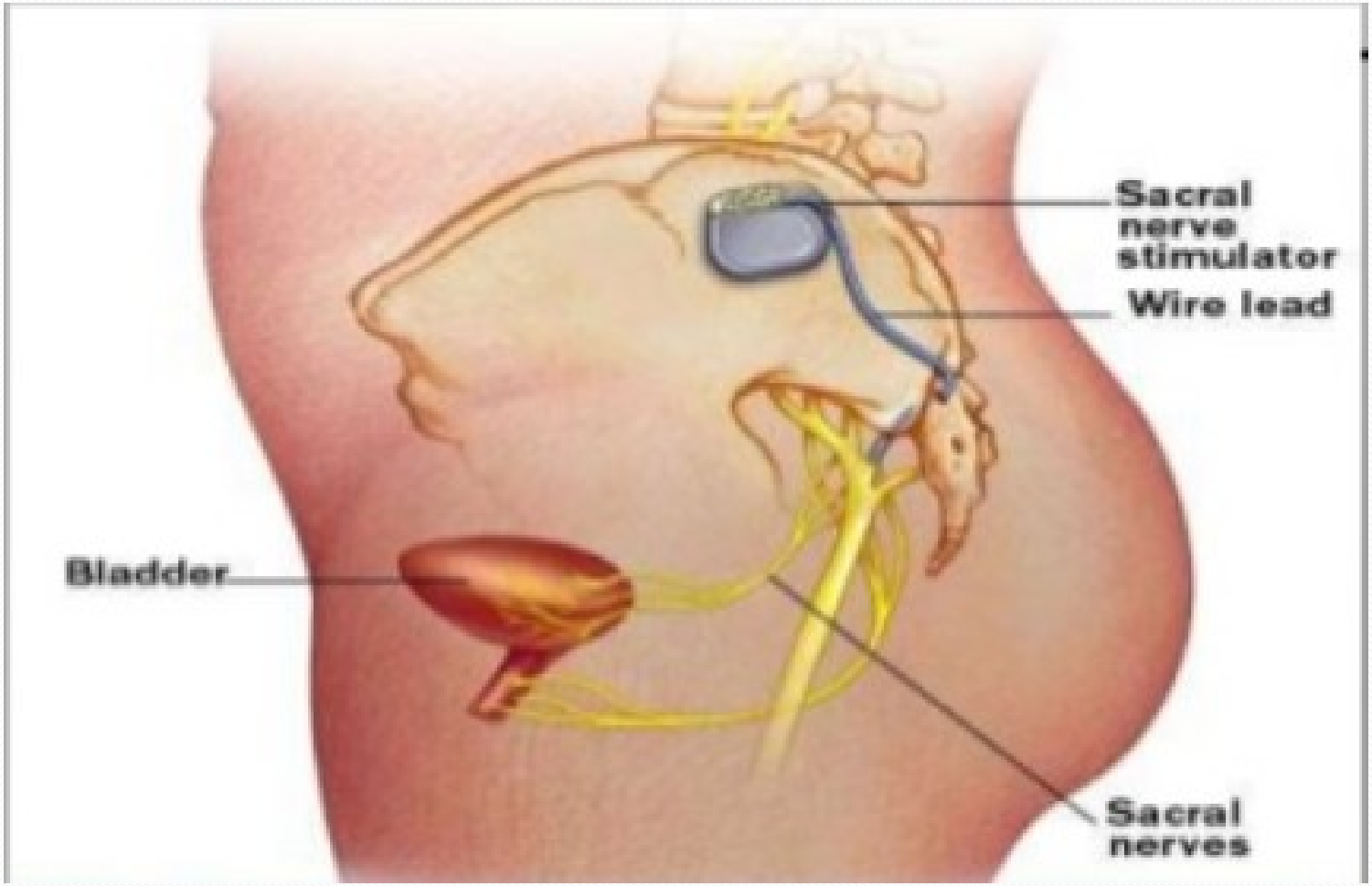
It can be used to help an individual to contract her pelvic floor muscles appropriately and is also useful in detecting improvement .following pelvic floor exercises

Weighted vaginal cones-3

These are currently available as sets of five or three all of the same shape and size but of increasing weight (20–90 g)


20g
34g
50g
68g

Maximal electrical stimulation-4



Vaginal devices may be useful for use during-5 .exercise on a short term basis

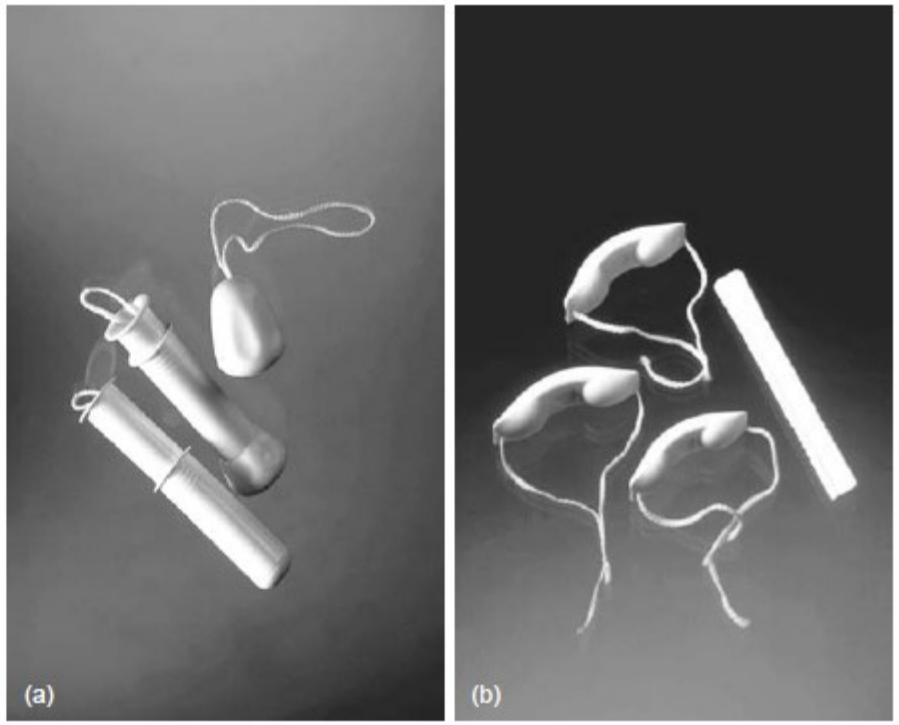


Fig. 49.21 Vaginal continence devices.
(a) Contrelle (CCT) and (b) Conveen (CCG).

Pharmacological – 2

Duloxetine-*1*

α1-adrenoceptor agonists, oestrogens and-2 tricyclic antidepressants have all been used for the treatment of stress incontinence

B. Surgical treatment of Urodynamic stress incontinence

:Aim of surgery

to provide suburethral support; restoration of the proximal urethra and bladder

neck to the zone of intra-abdominal pressure transmission; to increase urethral resistance;

:Vaginal procedures-1

Retropubic tape procedures TVT (tension free vaginal tape) the most popular surgical treatment for stress incontinence. In this operation a synthetic inert tape is inserted through vaginal incision and passed bellow the urethra by trocar and attached to the anterior abdominal wall.

Complications include bladder and urethral injury, stricture and retention of urine

TVT

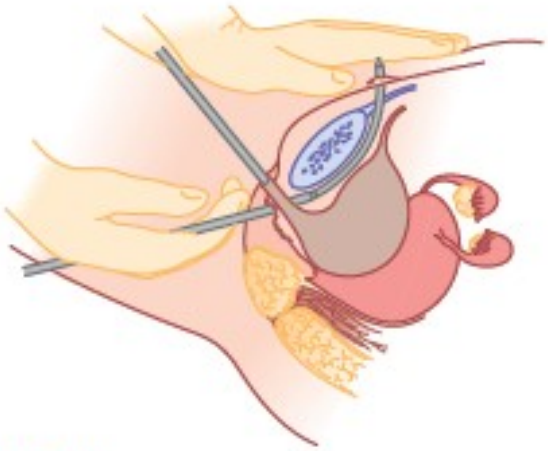
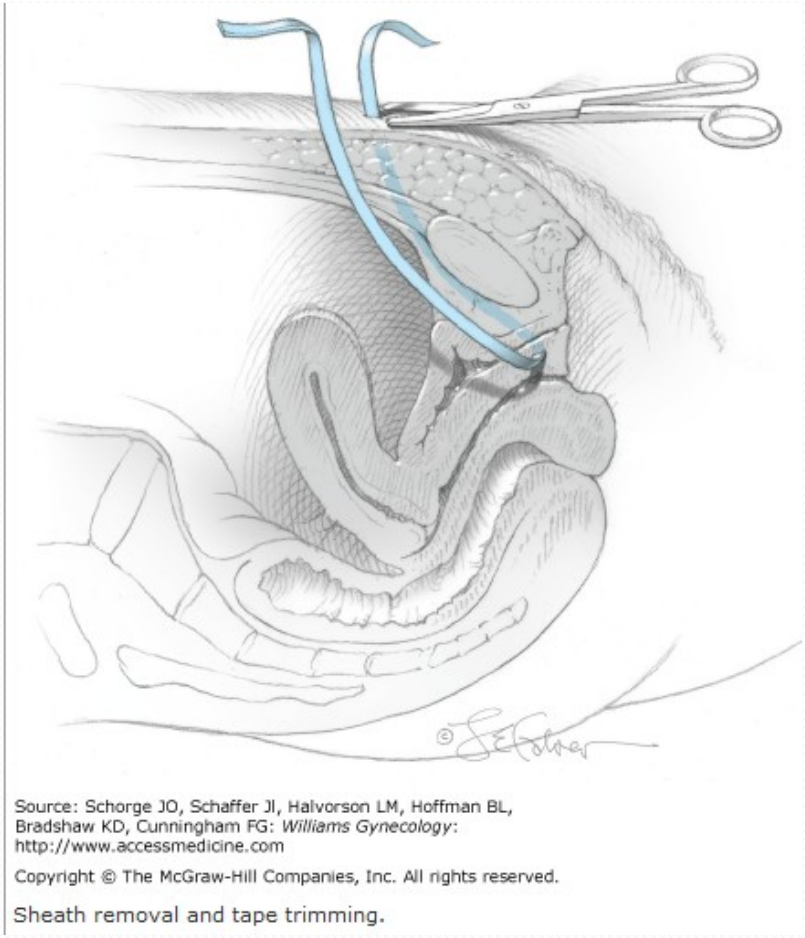
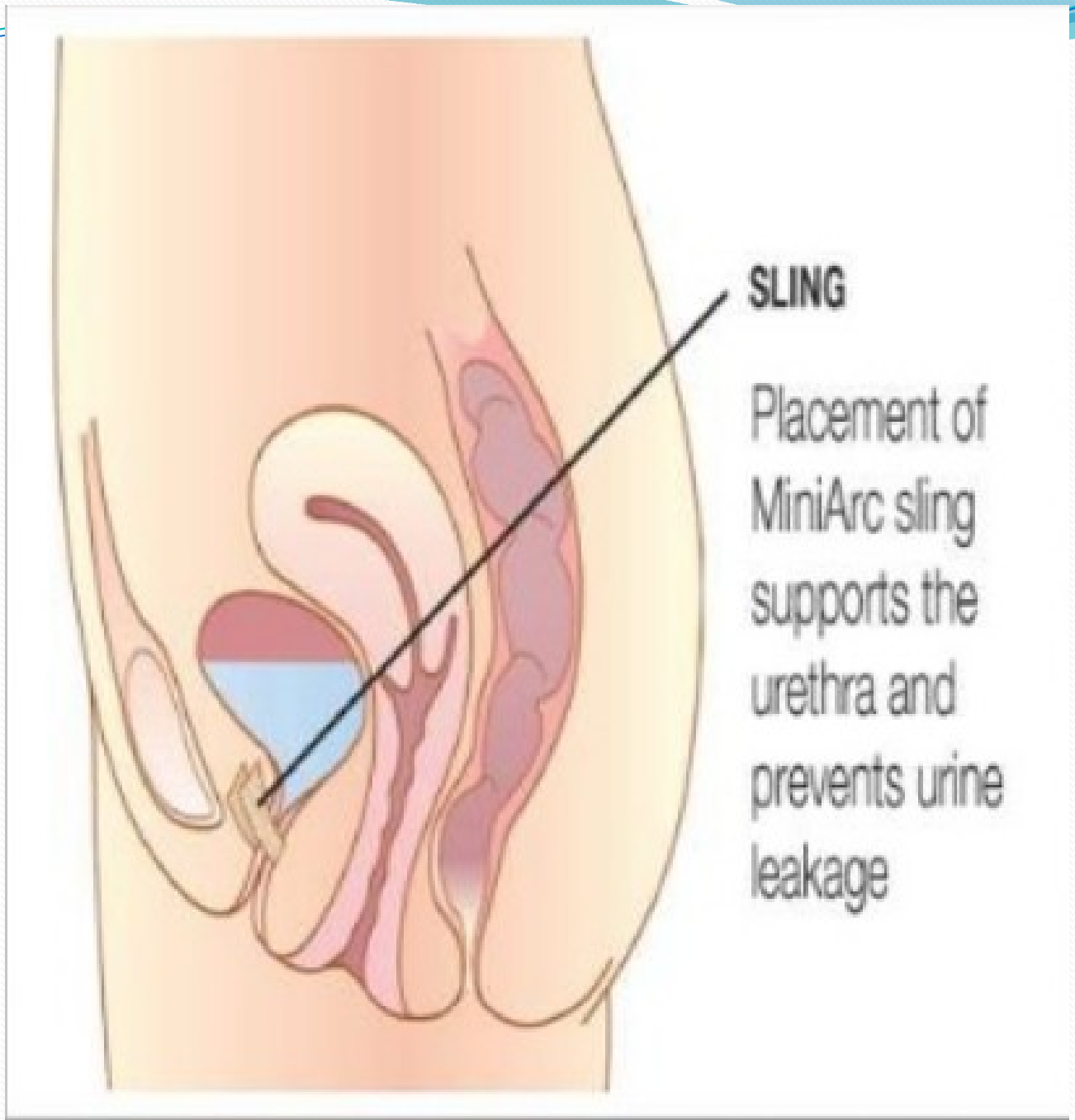


Figure 16.9 Introduction of tension-free vaginal tape trocar.



Source: Schorge JO, Schaffer JI, Halvorson LM, Hoffman BL, Bradshaw KD, Cunningham FG: *Williams Gynecology*: http://www.accessmedicine.com

Sheath removal and tape trimming.

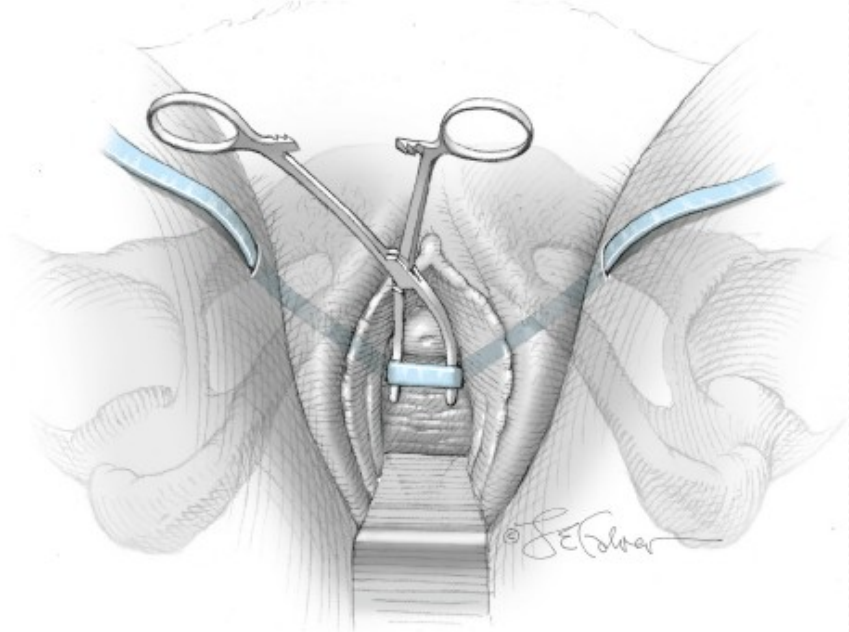

SLING
Placement of MiniArc sling supports the urethra and prevents urine leakage

:Transobturator tape procedures TOT

In this operation a tape is inserted through vaginal incision and passed bellow the urethra through the lower part of obturator membrane into the medial aspect of thigh. It requires special needle. This operation is .widely used now days

Complications: hemorrhage, infection and the patient may have chronic pelvic pain

TOT



Source: Schorge JO, Schaffer JI, Halvorson LM, Hoffman BL, Bradshaw KD, Cunningham FG: *Williams Gynecology*: http://www.accessmedicine.com

Setting mesh tension.

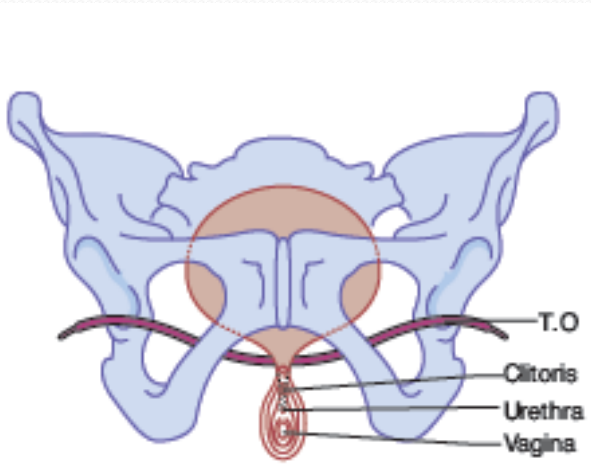


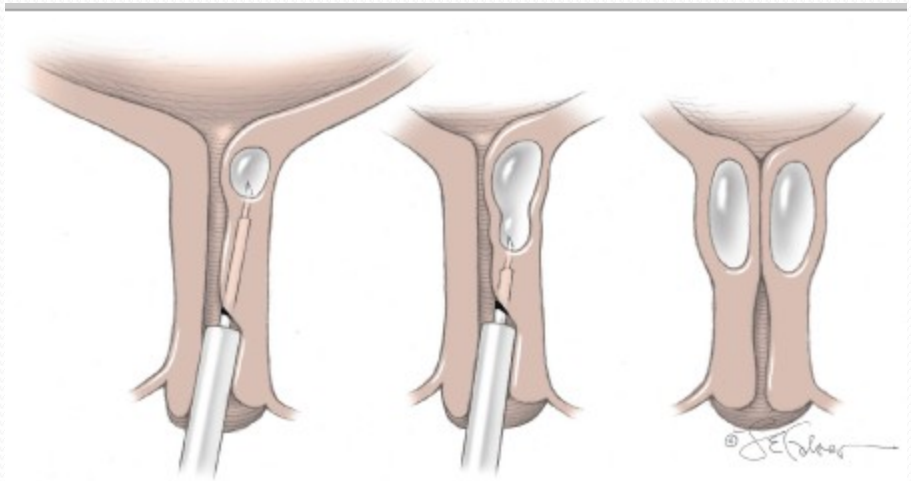
Figure 16.10 Transobturator tape.

:Anterior colporrhaphy

is still performed for stress incontinence. Although it is usually the best operation for a cystourethrocele, the cure rates for urodynamic stress incontinence are poor compared to suprapubic procedures. The success rate is about 60%

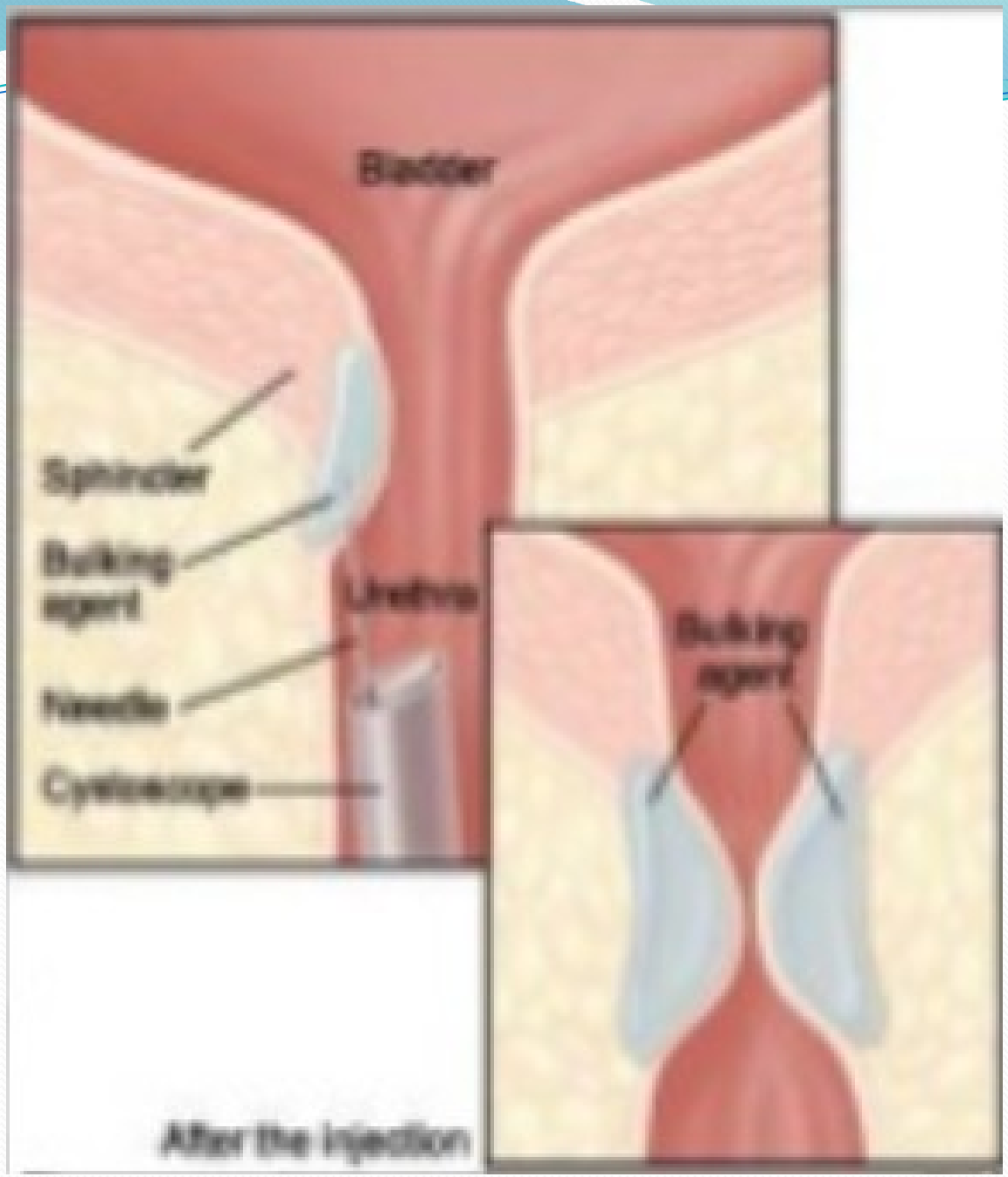
:Urethral bulking agents

are minimally invasive surgical procedures for the treatment of urodynamic stress incontinence and may be useful in the elderly and those women who have undergone previous operations and have a fixed, scarred .fibrosed urethra



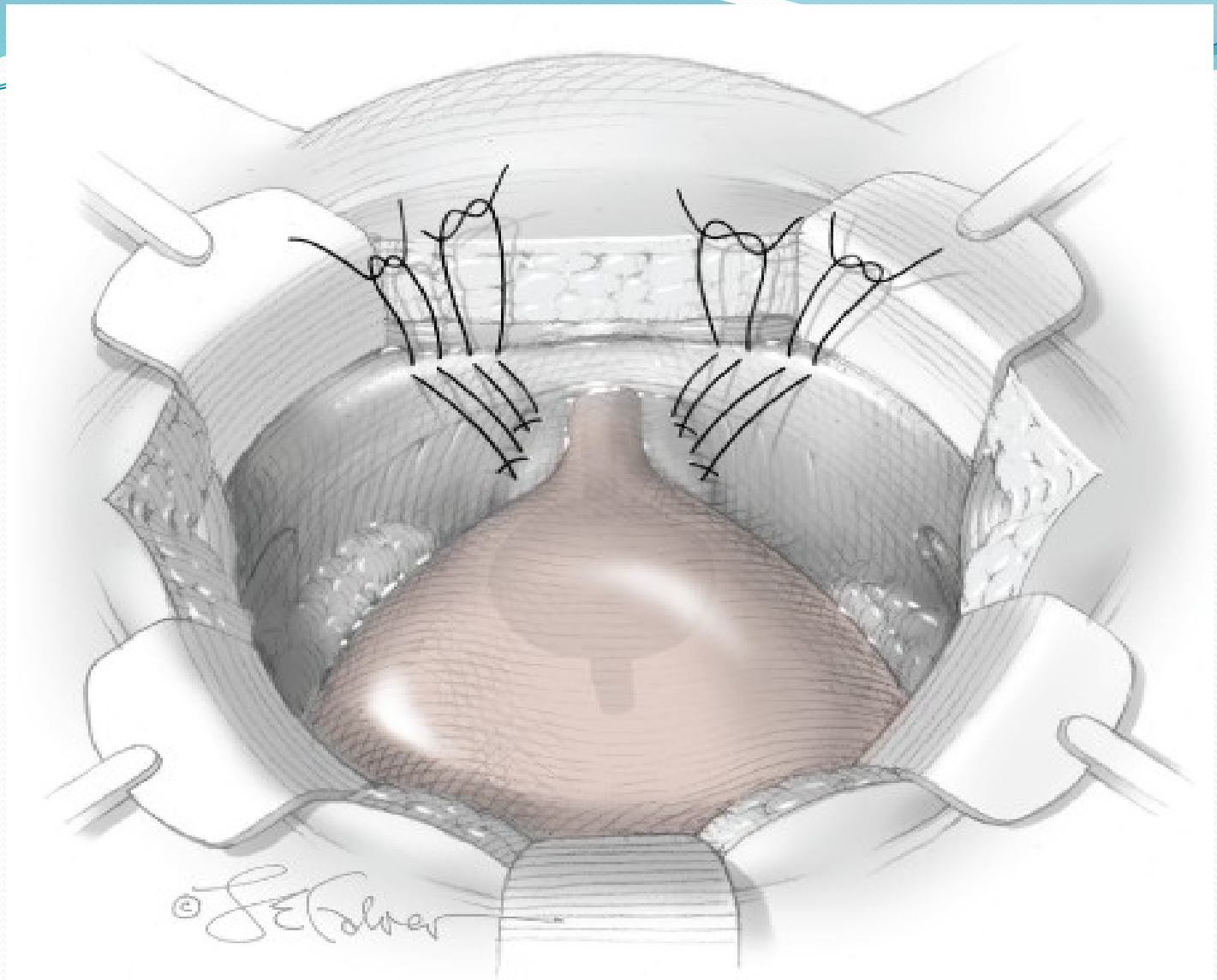
Source: Schorge JO, Schaffer JI, Halvorson LM, Hoffman BL, Bradshaw KD, Cunningham FG: *Williams Gynecology*: http://www.accessmedicine.com

Injection of bulking agent.


Bladder
Sphincter
Bulking agent
Urethra
Needle
Cystoscope
Bulking agent
After the injection

Abdominal: performed through an abdominal incision ***-2***

Burch colposuspension: In this operation the Para urethral tissues are sutured to the ipsilateral iliopectineal ligament to elevate the bladder base. The success rate is over .90%



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Suture placement.

:Marshall–Marchetti–Krantz procedure

is a suprapubic operation in which the paraurethral tissue at the level of the bladder neck is sutured to the periostium and/or perichondrium of the posterior aspect of the pubic symphysis. It is less popular due to the .risk of periostitis

Laparoscopic colposuspension***-3***

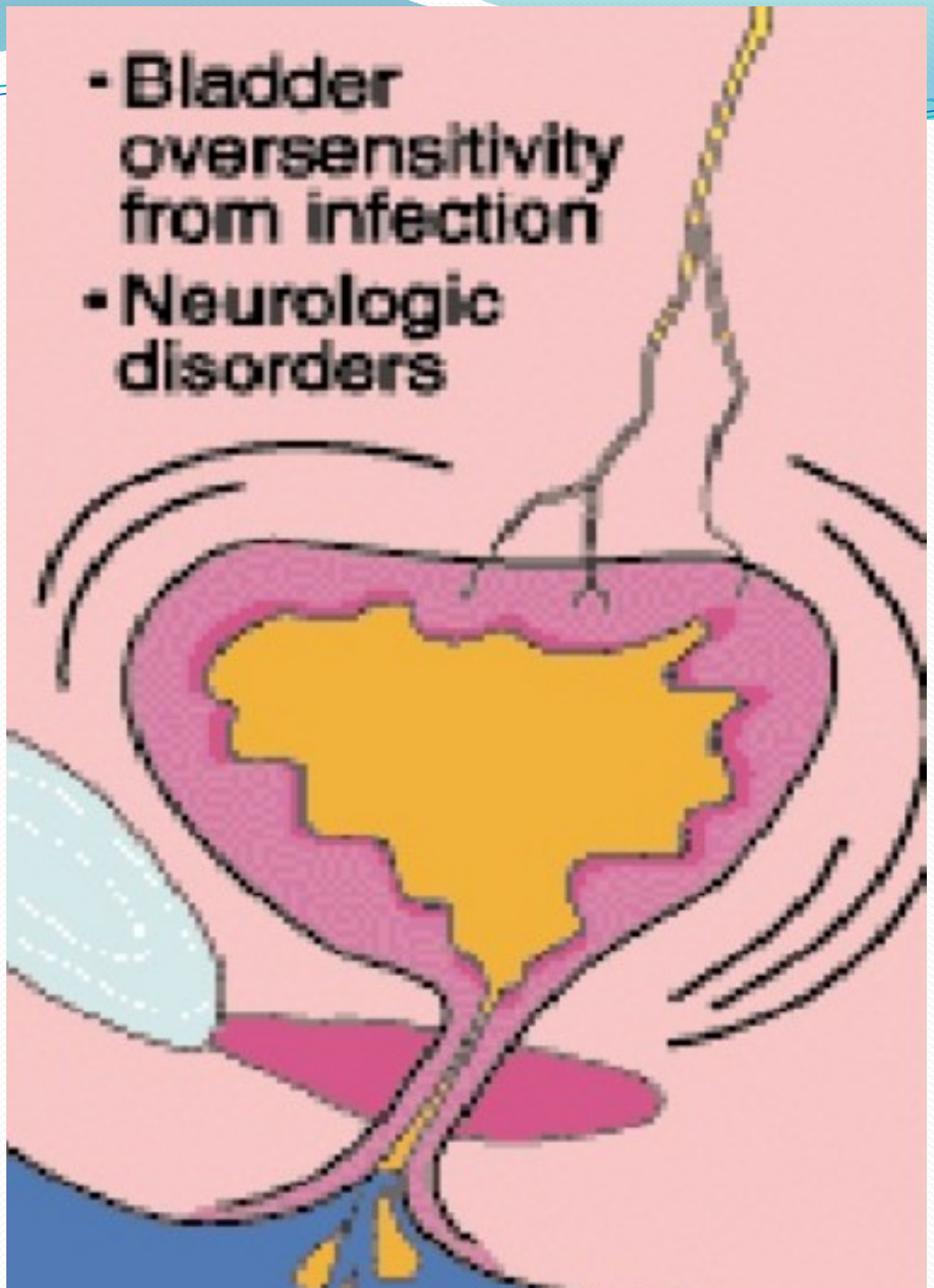
Complex -4

Artificial sphincter May be employed when conventional surgery fails. This is implantable and consists of a fluid-filled inflatable cuff which is surgically placed around the bladder .neck

:Detrusor overactivity DO

previously called detrusor instability, is **a urodynamic observation** characterized by involuntary detrusor contractions during the filling phase which may be spontaneous or provoked (such as drinking or changing position).

This is primarily a disease of unknown cause in which the bladder contracts strongly to expel the minimum amount of urine which is normally tolerated by normal balder, and there is excessive cholinergic stimulation of the detrusor .muscle


• Bladder oversensitivity from infection
• Neurologic disorders

Risk factors for detrusor overactivity

- Childhood bedwetting.
- Obesity.
- Smoking.
- Previous hysterectomy.
- Previous continence surgery

Clinical presentation

The combination of symptoms of urgency, frequency and nocturia is termed the overactive bladder (OAB).

When detrusor contractions observed during cystometry the diagnosis of detrusor overactivity is established.

In most of the cases physical examination reveals nothing; However; mass, prolapse and atrophy should be excluded and cough test is performed to exclude USI.

Neurological exam as bladder hyper reflexia may be the earliest sigh of multiple sclerosis.

Investigations: same as USI

Treatment

Bladder retraining Instruct to void every 1.5 h during the day; she must not void between these times, she must wait or be incontinent. Increase voiding interval by half an hour when initial goal achieved, and continue with .2-hourly voiding and so on

Drug therapy

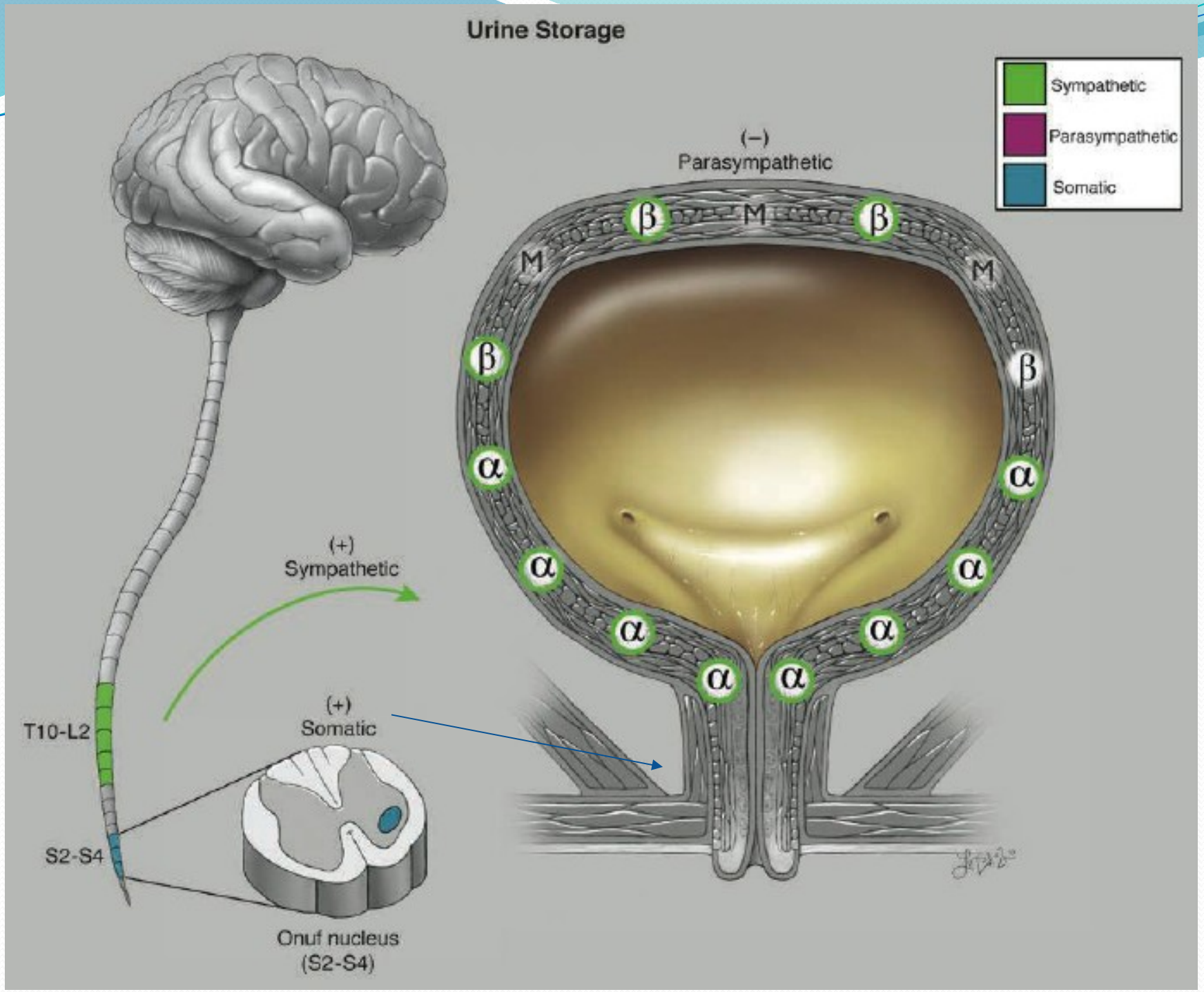
Imipramine: is a tricyclic antidepressant drug which has also anticholinergic properties. In a dose of 25 mg for 3 months up to 90 % of women get improvement

Tolterodine is a competitive muscarinic receptor antagonist with relative functional selectivity for .bladder muscarinic receptors

Oxybutynin is anticholinergic drug which has special affinity to the detrusor muscle. It is much .superior to imipramine

Solifenacin: is a potent selective M3 receptor antagonist

Mirabegron: More recently, a **β3-adrenergic** receptor agonist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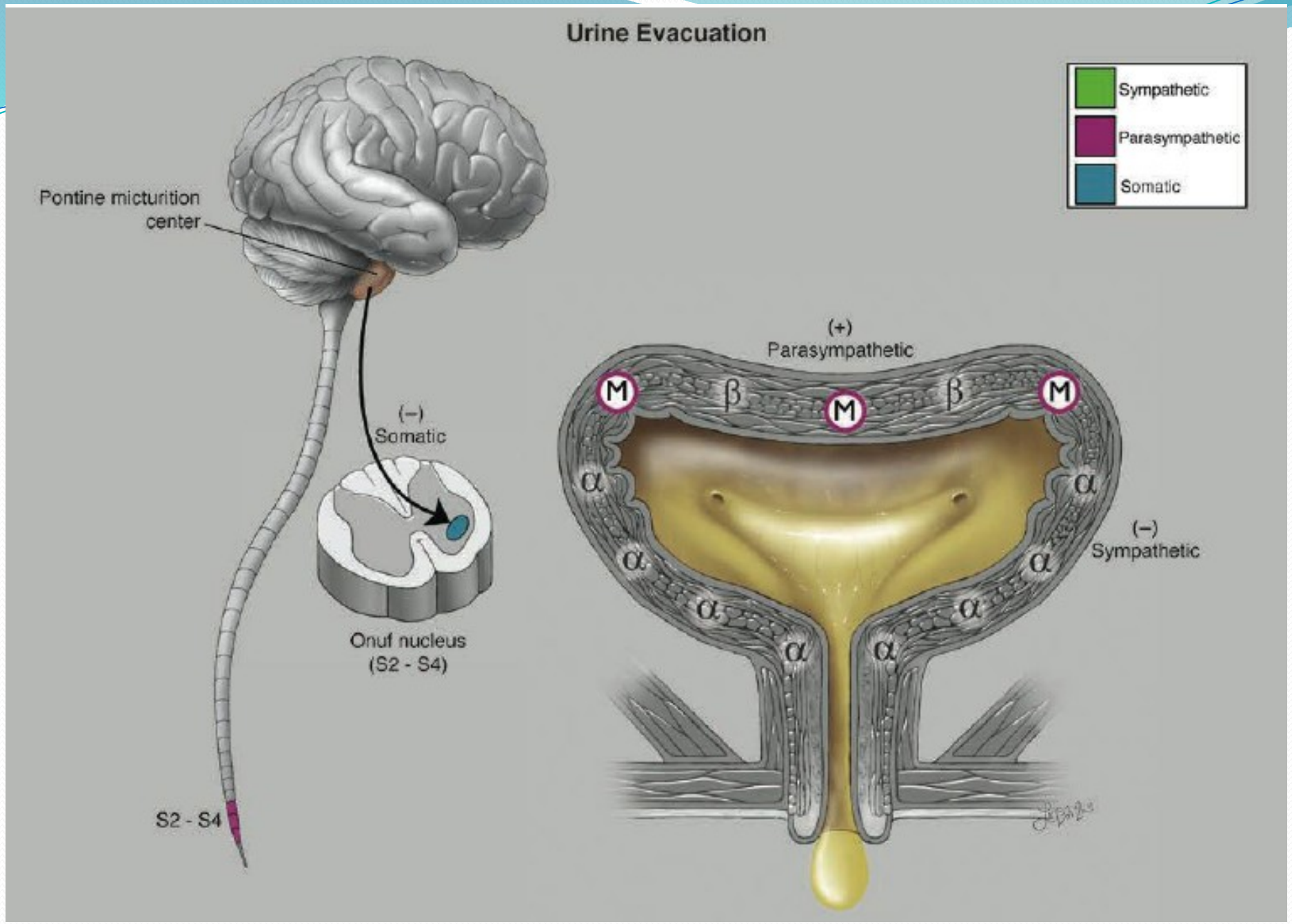
Somatic
T10-L2
S2-S4
Onuf nucleus
(S2-S4)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(–) Somatic
Onuf nucleus (S2 - S4)
S2 - S4
(+) Parasympathetic
M
β
α
(–) Sympathetic

Desmopressin is a synthetic vasopressin analogue. It has strong antidiuretic effects .without altering blood pressure

Intravesical therapy intravesical administration of Botulinum toxin may offer an alternative to surgery in those women with intractable detrusor overactivity

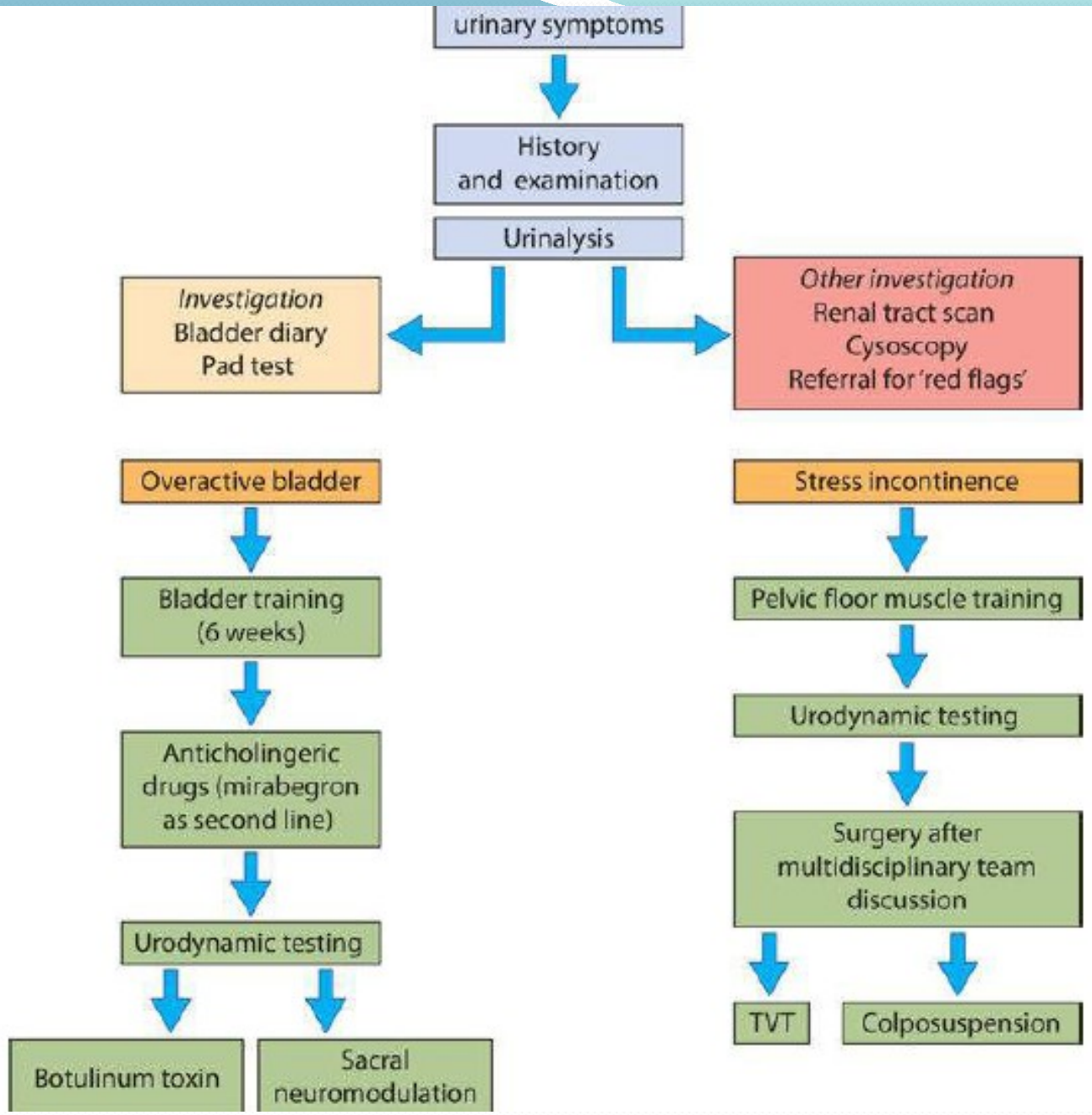
Neuromodulation Stimulation of the dorsal sacral nerve has been developed for use in patients with both idiopathic and neurogenic detrusor overactivity

Surgery

Clam cystoplasty-1

detrusor myectomy-2

urinary diversion-3


urinary symptoms
History and examination
Urinalysis
Investigation
Bladder diary
Pad test
Other investigation
Renal tract scan
Cysoscopy
Referral for 'red flags'
Overactive bladder
Bladder training (6 weeks)
Anticholingeric drugs (mirabegron as second line)
Urodynamic testing
Botulinum toxin
Sacral neuromodulation
Stress incontinence
Pelvic floor muscle training
Urodynamic testing
Surgery after multidisciplinary team discussion
TVT
Colposuspension

Retention with overflow

Insidious failure of bladder emptying may lead to chronic retention and finally, when normal voiding is ineffective, to overflow incontinence

Symptoms

Symptoms include poor stream, incomplete bladder emptying and straining to void, together with overflow stress incontinence. Often there will be recurrent urinary tract infection. Cystometry is usually required to make the diagnosis, and bladder ultrasonography or intravenous urogram may be necessary to investigate .the state of the upper urinary tract to exclude reflux

Thank you