SUI AND POP

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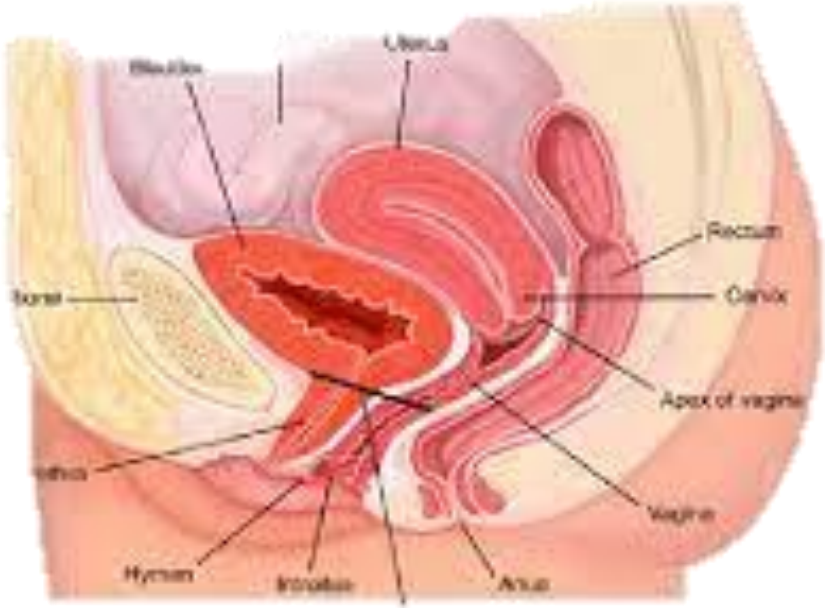
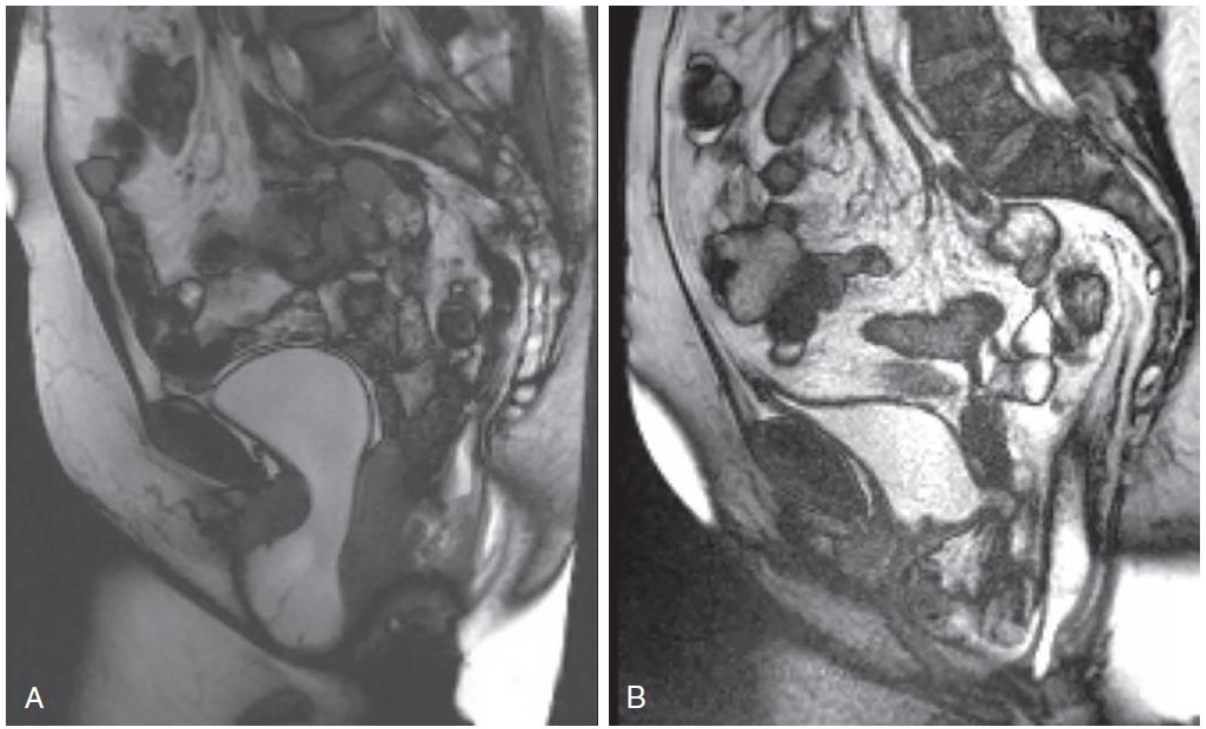


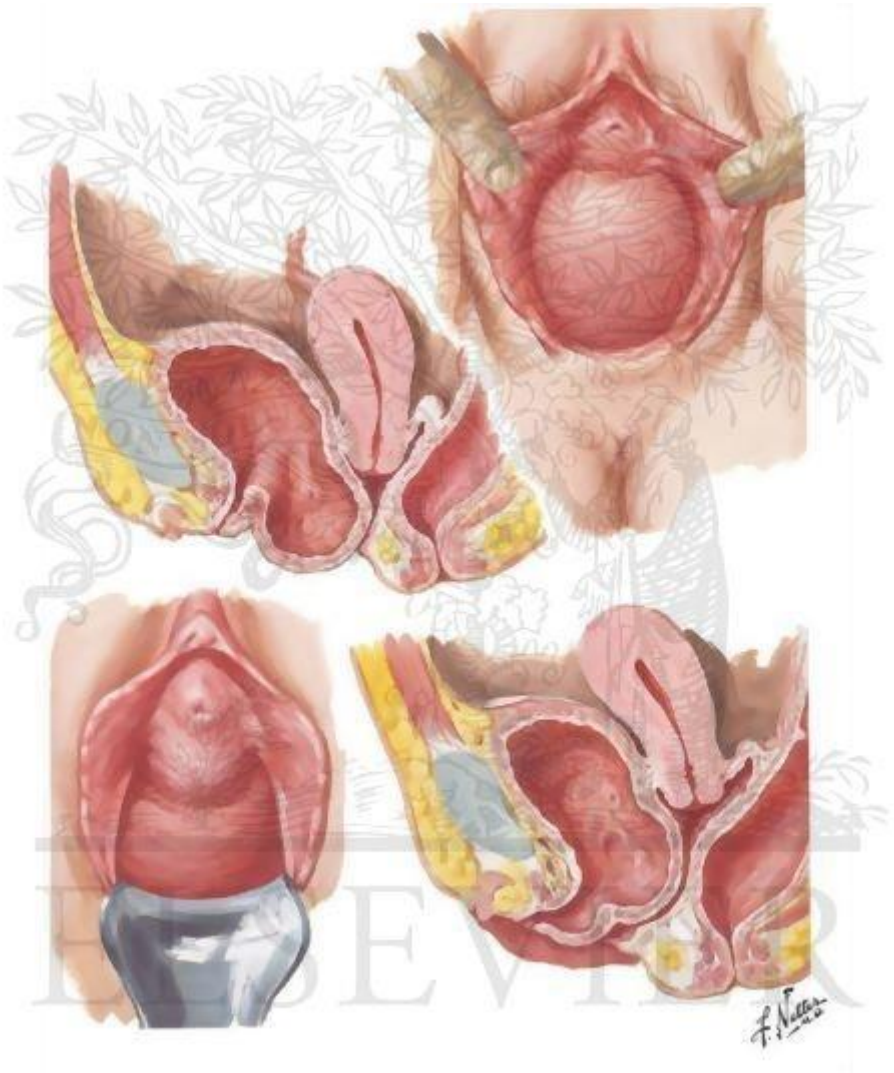
Content

1. Pelvic floor prolapse
2. Overactive bladder
3. Stress urinary incontinence
4. Urinary tract infection

PELVIC FLOOR PROLAPSE

- Pelvic organ prolapse refers to the **downward displacement** of the **pelvic organs**, which results in protrusion of the uterus and/or the different vaginal compartments and their surrounding organs
- cystocele, rectocele, enterocele, or urethrovesical junction
- Anterior compartment prolapse, Apical prolapse, Posterior compartment prolapse
- A vaginal bulge that can be seen or felt by a patient is the most specific symptom for POP
- The prevalence of symptomatic prolapse ranges from **3% to 12%,** although asymptomatic prolapse is present in the majority of adult women
- **Anterior compartment** prolapse is the **most frequent** location of prolapse.





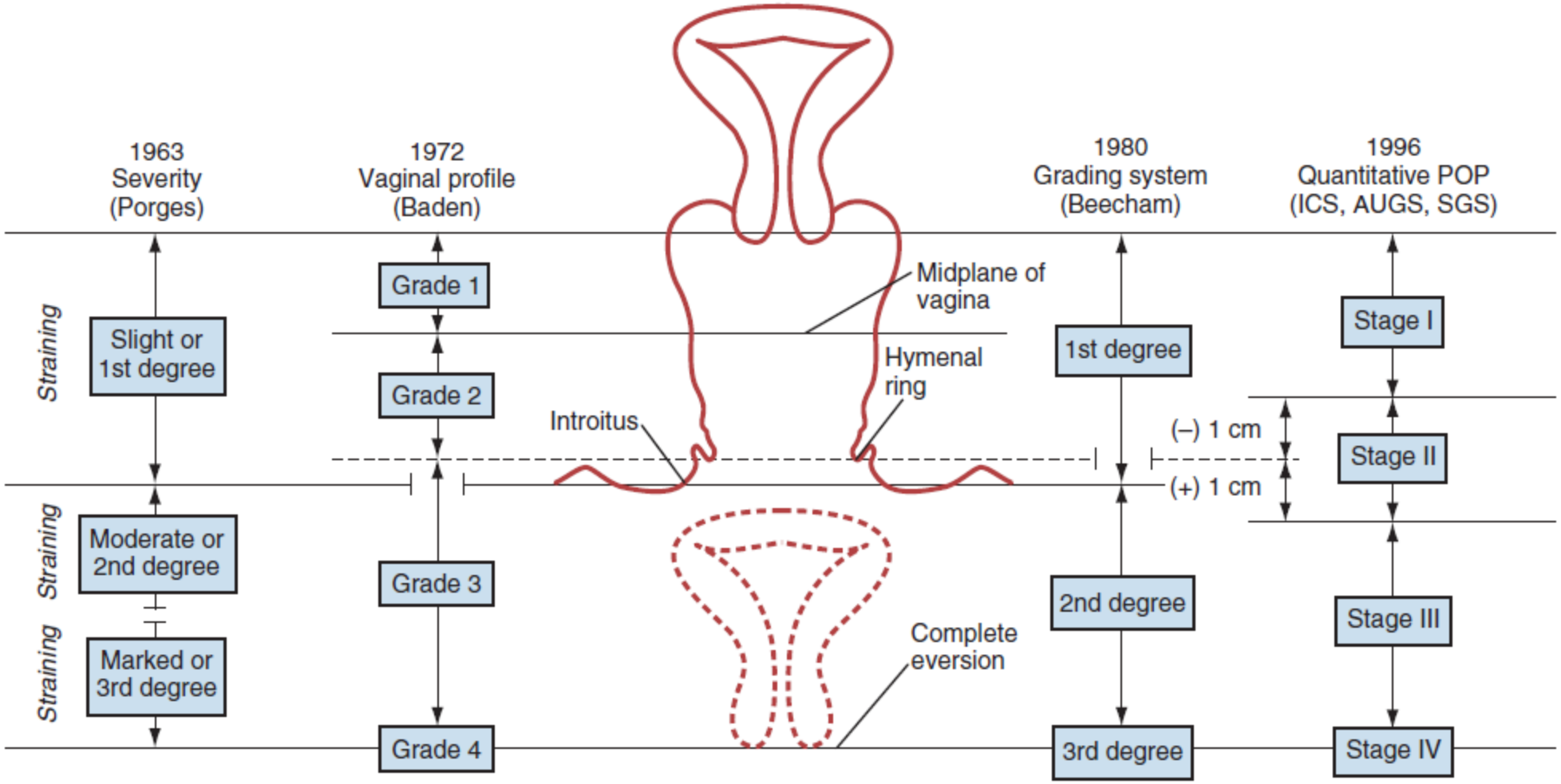
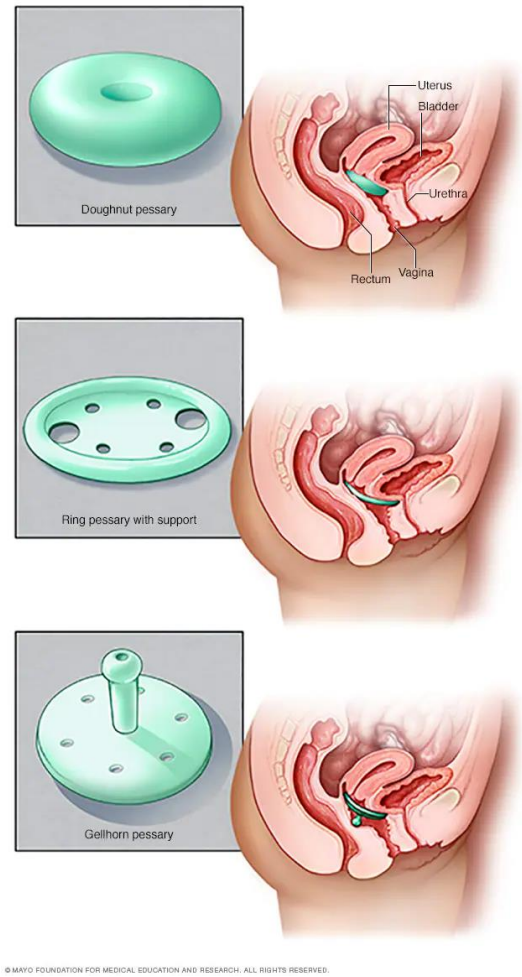


Fig. 112.1. Visual comparison of systems used to quantify pelvic organ prolapse (POP). *AUGS,* American Urogynecologic Society; *ICS,* International Continence Society; *SGS,* Society of Gynecologic Surgeons. (From Theofrastous JP, Swift SE. The clinical evaluation of pelvic floor dysfunction. *Obstet Gynecol Clin North Am* 25:783–804, 1998.)

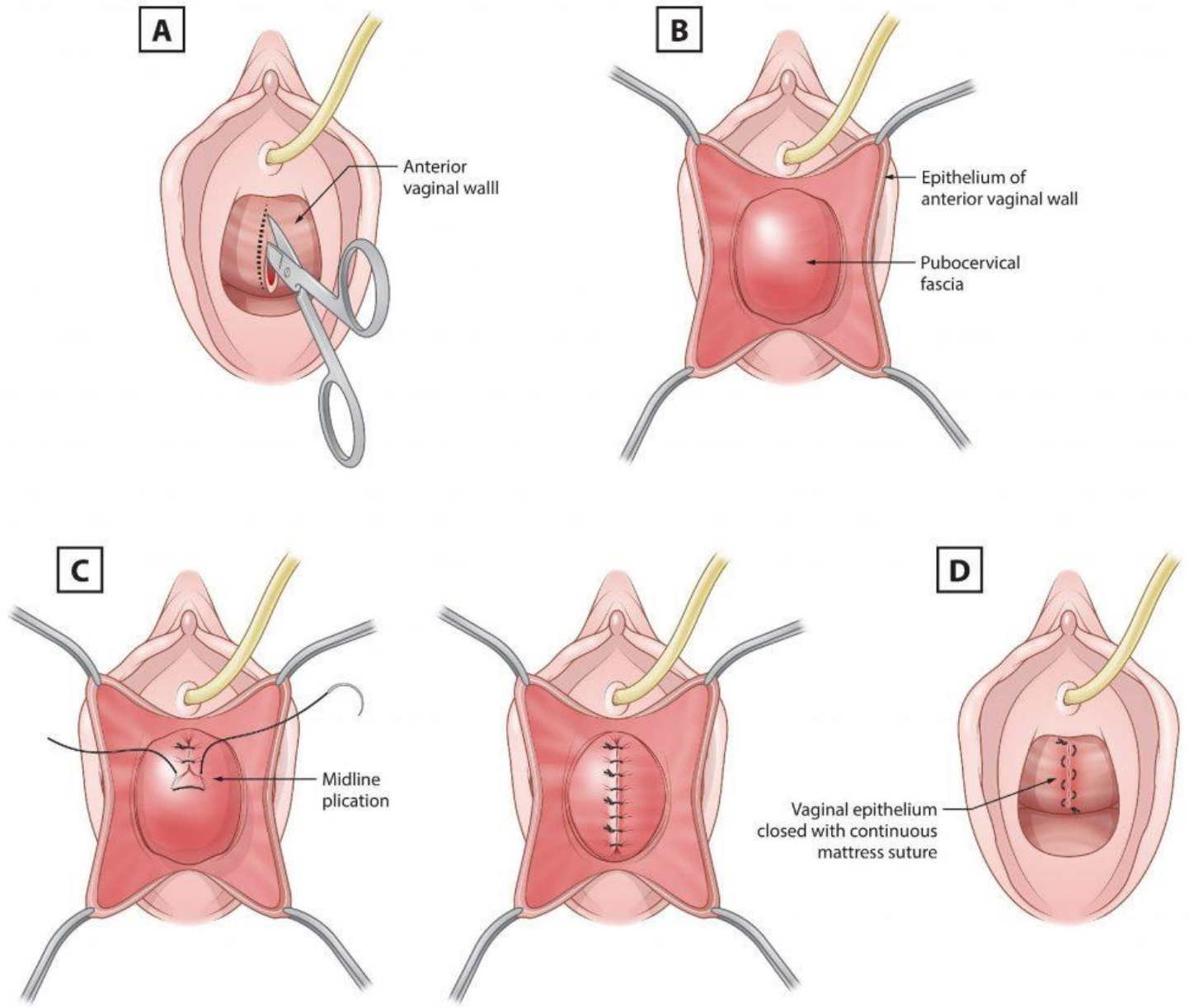
Risk Factors for Pelvic Organ Prolapse

- Parity had the strongest association with the development of POP
- Every additional delivery up to five births increases the risk of prolapse by 10% to 20%
- Cesarean section seems to be protective against prolapse
- Obesity
- Hysterectomy

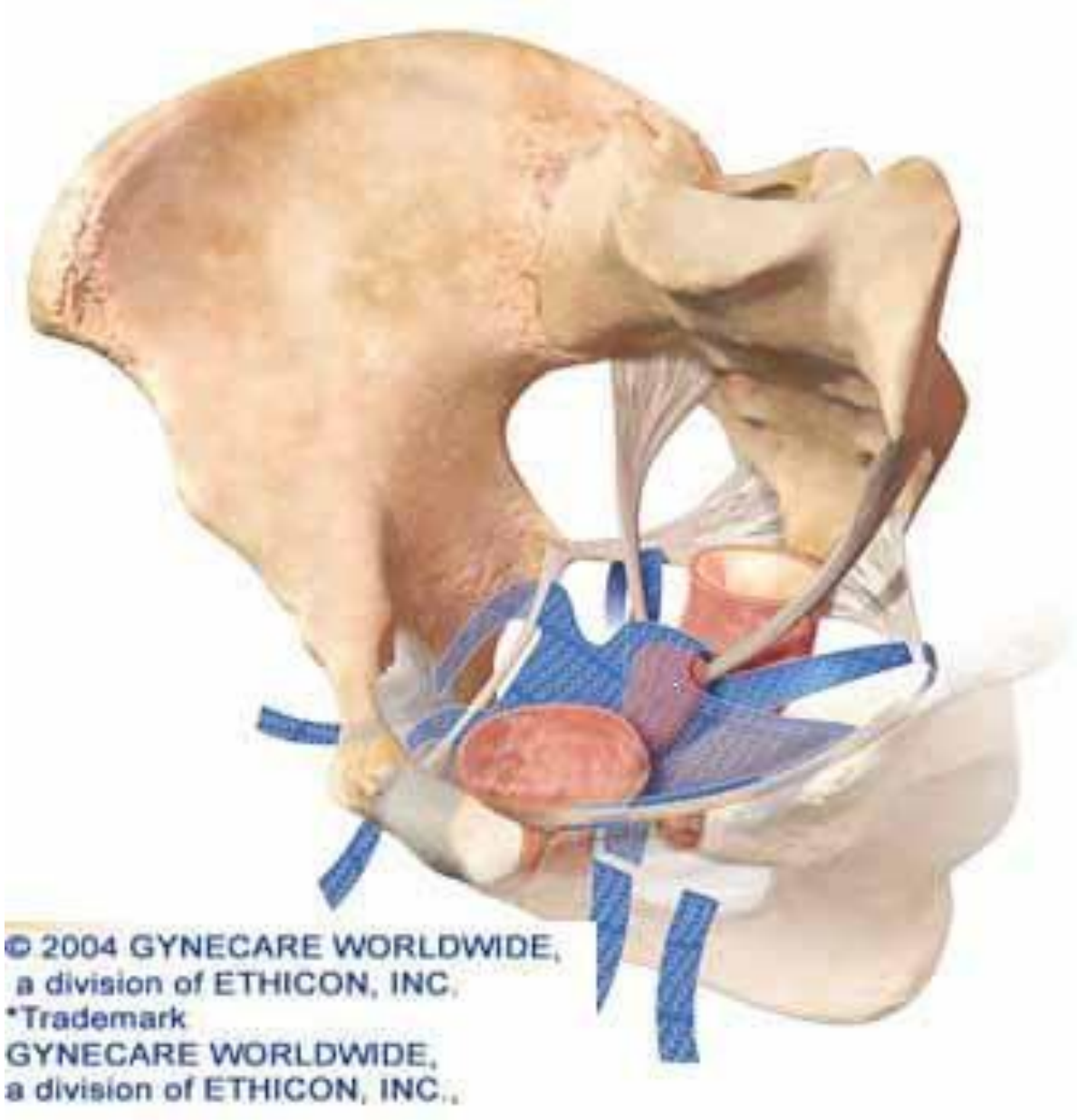
Treatment for cystocele



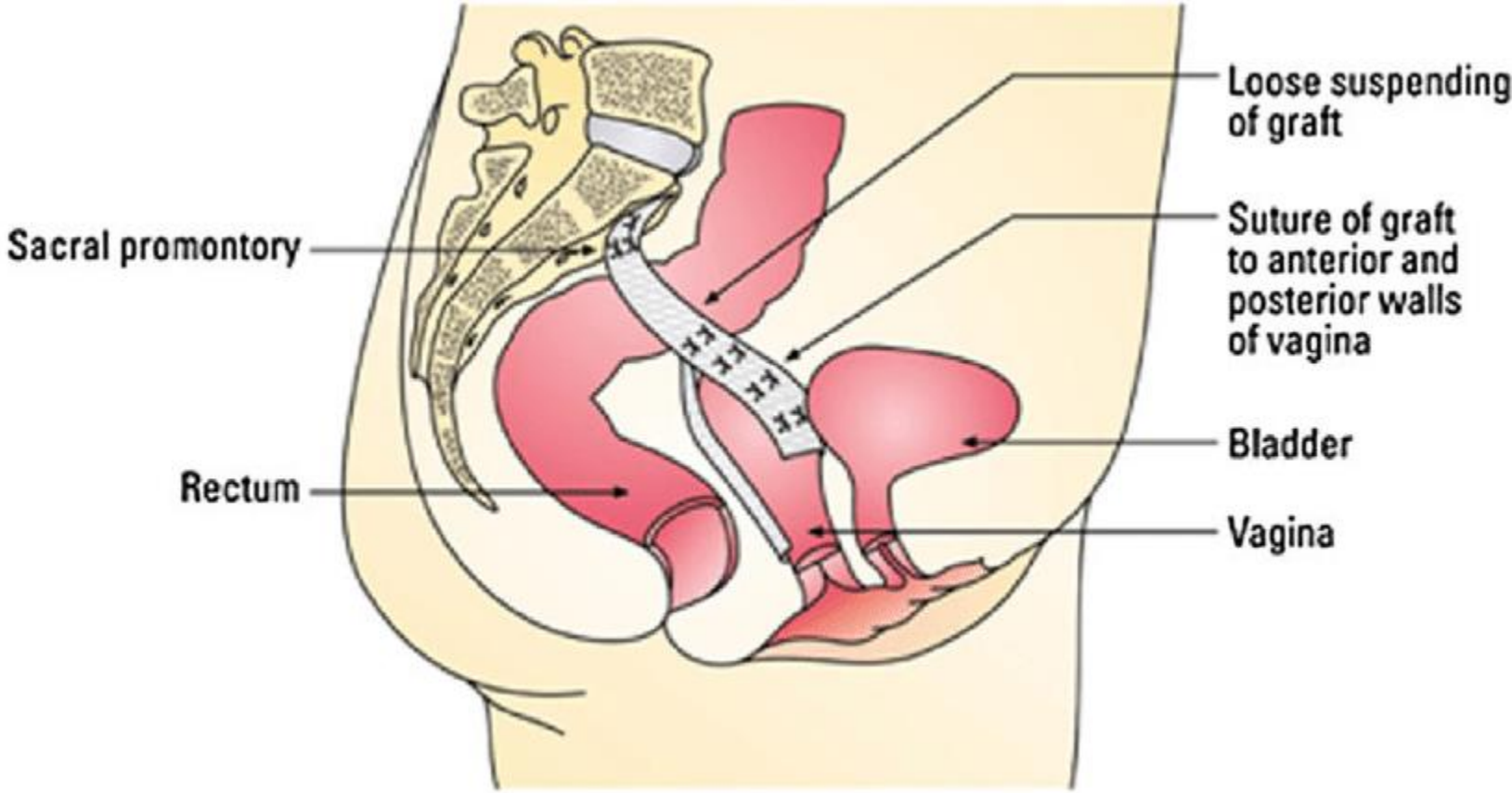
anterior colporrhaphy



Pelvic reconstruction with mesh



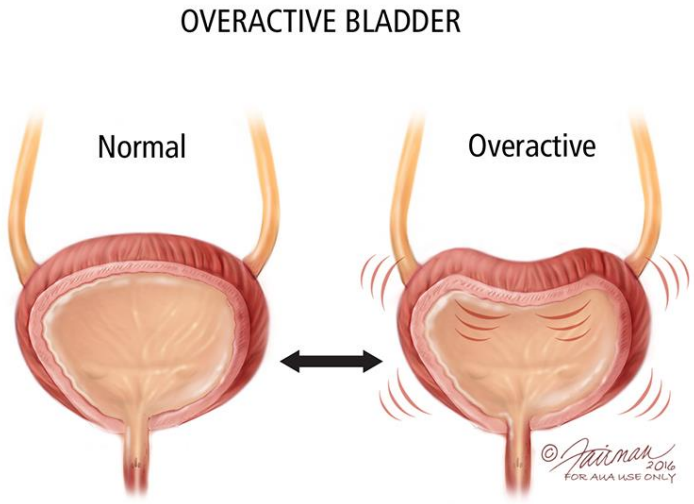
sacrocolpopexy



OVERACTIVE BLADDER

Definition

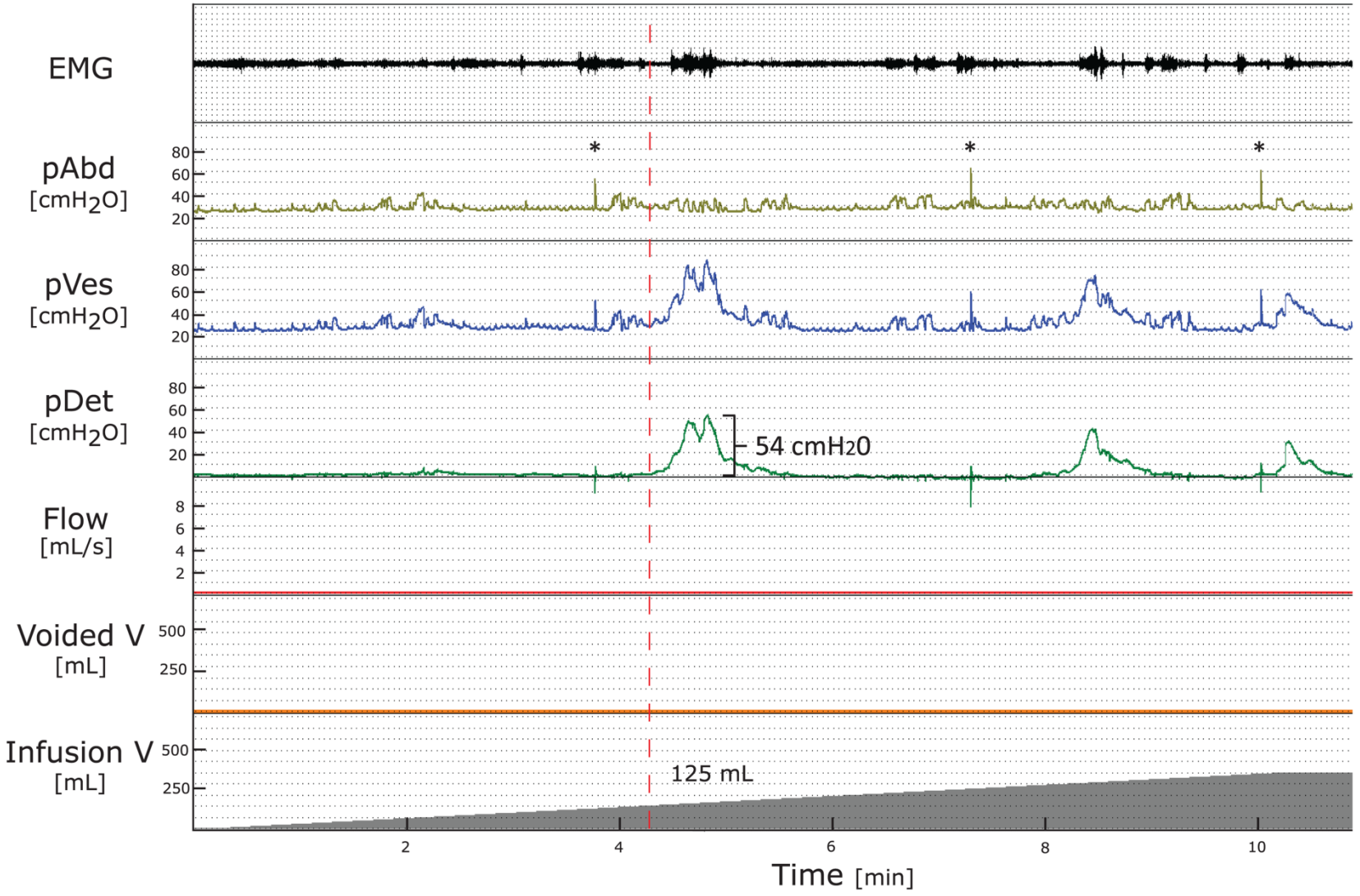
- **Urinary urgency**, usually accompanied by frequency and nocturia, with or without urgency urinary incontinence, in the absence of urinary tract infection (UTI) or other obvious pathology
- Urinary urgency definition: sudden, compelling desire to pass urine that is difficult to defe
- Overactive bladder (OAB) wet: with incontinence
  OAB dry: without incontinence

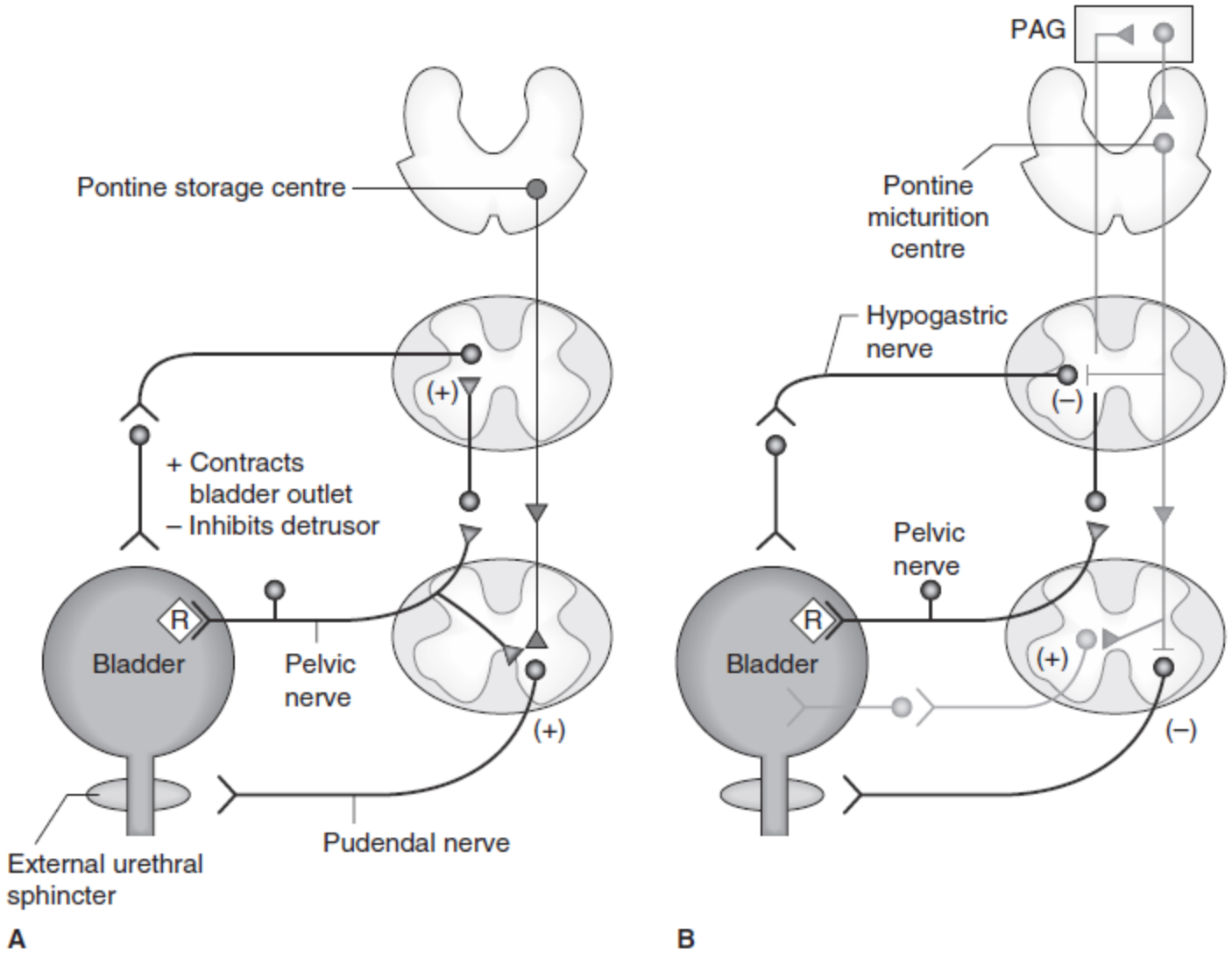


Cause of OAB

- Neurogenic OAB ➔ suprasacral CNS lesion
- Bladder outlet obstruction ➔ long-term outlet obstruction result bladder overactivity
- Age related
- Idiopathic

Urodynamic study: detrusor overactivity

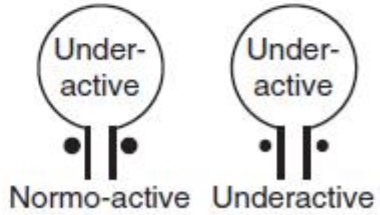



Pontine storage centre
(+)
+ Contracts
bladder outlet
– Inhibits detrusor
R
Bladder
Pelvic
nerve
(+)
Pudendal nerve
External urethral
sphincter
A
PAG
Pontine
micturition
centre
Hypogastric
nerve
(–)
Pelvic
nerve
R
Bladder
(+)
(–)
B

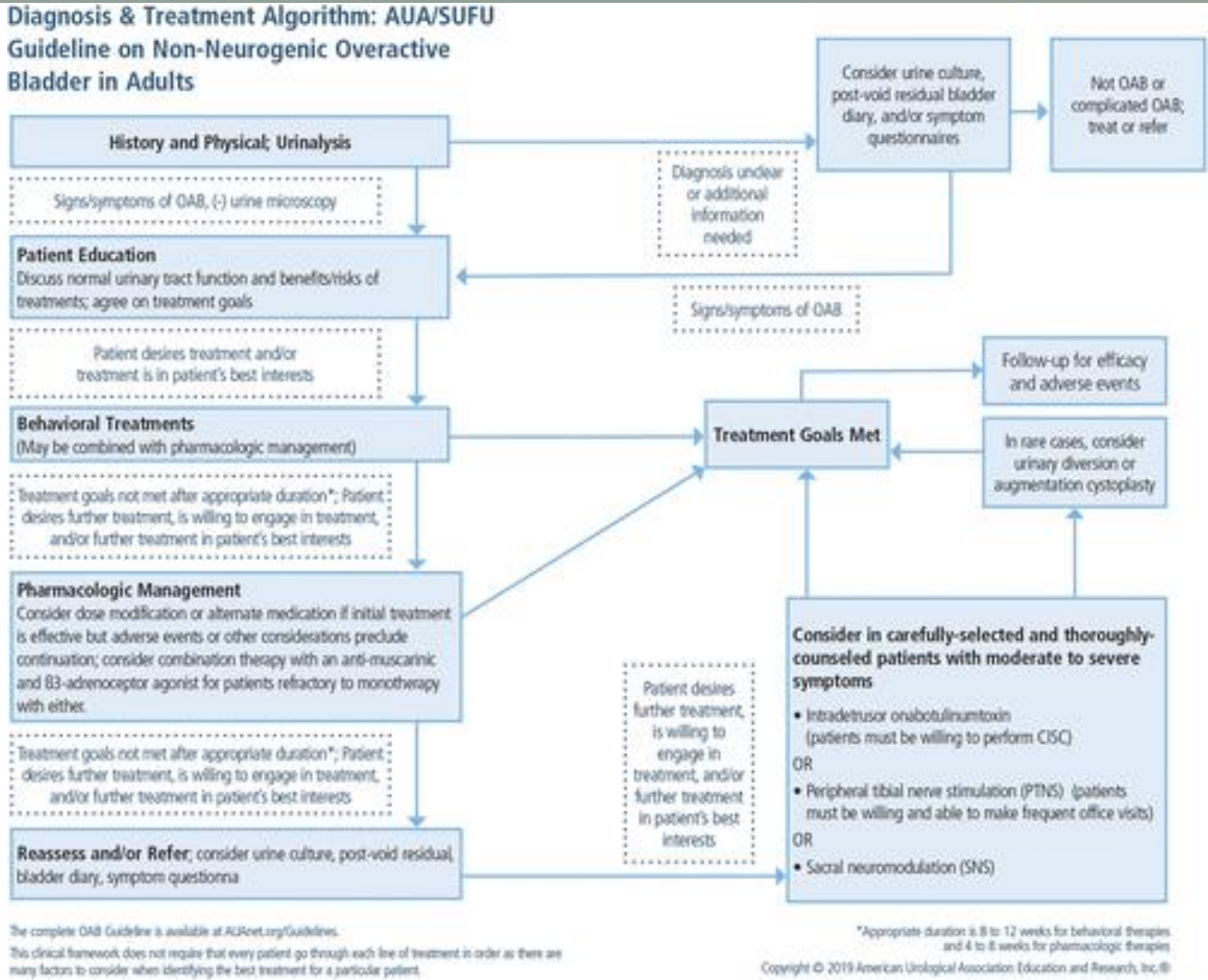
Suprapontine lesion
- **History:** predominantly storage symptoms
- **Ultrasound:** insignificant PVR urine volume
- **Urodynamics:** detrusor overactivity

Spinal (infrapontine-suprasacral) lesion
- **History:** both storage and voiding symptoms
- **Ultrasound:** PVR urine volume usually raised
- **Urodynamics:** detrusor overactivity, detrusor-sphincter dyssynergia

Sacral/infrasacral lesion
- **History:** predominantly voiding symptoms
- **Ultrasound:** PVR urine volume raised
- **Urodynamics:** hypocontractile or acontractile detrusor



1. Behavior treatment
2. Drug treatment
3. Botulinum toxin injection sacral neuromodulation peripheral



Behavior treatment for OAB

- Water intake control
- Time voiding
- Avoiding coffee and tea
- Stress associated OAB

Drug treatment

- M2, M3 anti-muscarinic
- Beta 3 agonist
- Although **M2** receptors are the **predominant** cholinoreceptor present in urinary bladder, the smaller population of **M3-**receptors appears to be the **most functionally important** and mediates direct contraction of the detrusor muscle

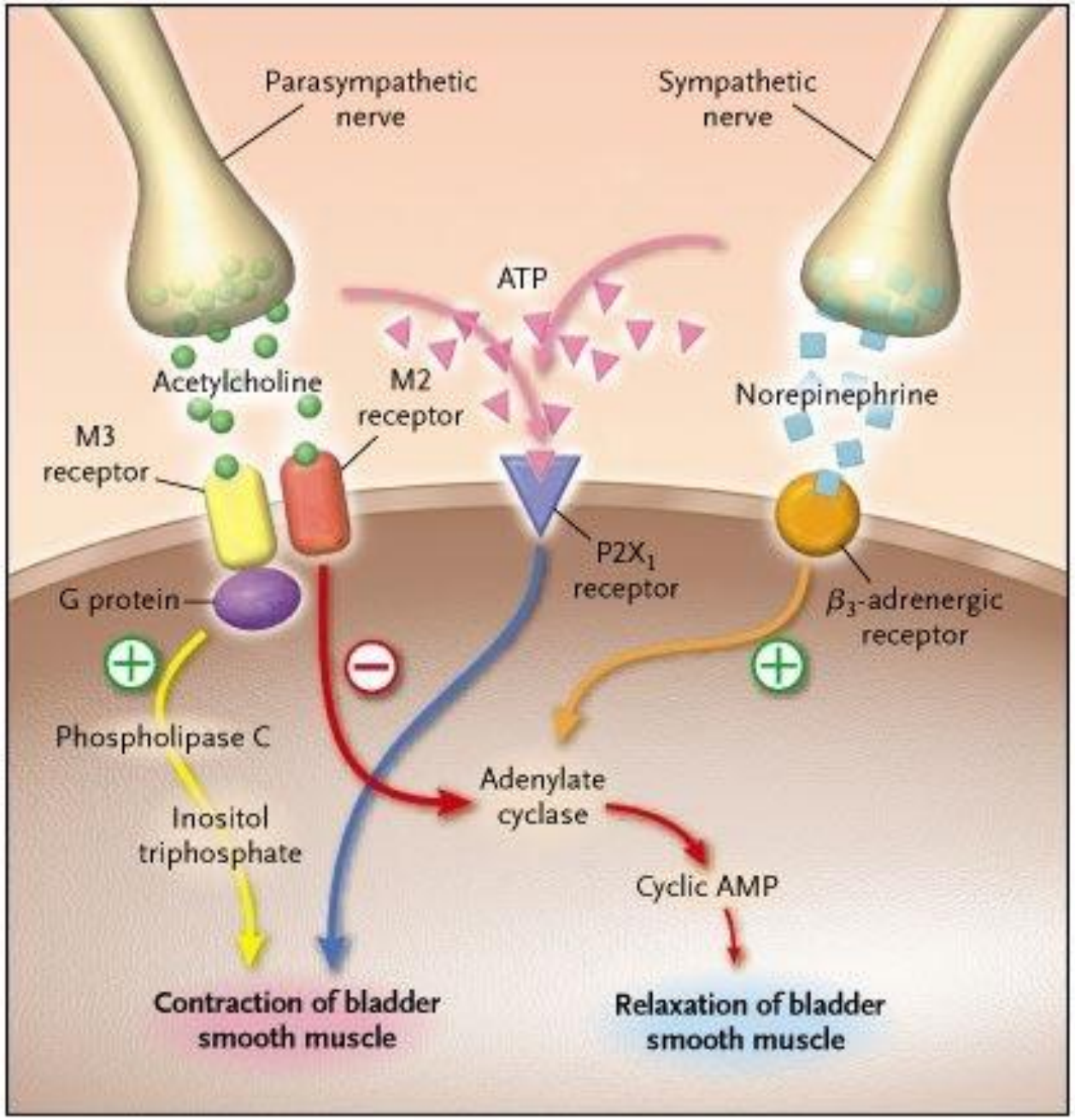


TABLE 2. Relative muscarinic subtype selectivity of anticholinergic agents

Anticholinergic agent	M_3 vs. M_1 selectivity	M_3 vs. M_2 selectivity
Darifenacin	High	High
Solifenacin	Moderate	Moderate
Oxybutynin	None	Moderate
Fesoterodine	None	None
Tolterodine	None	None
Trospium	None	None
Propiverine	None	None

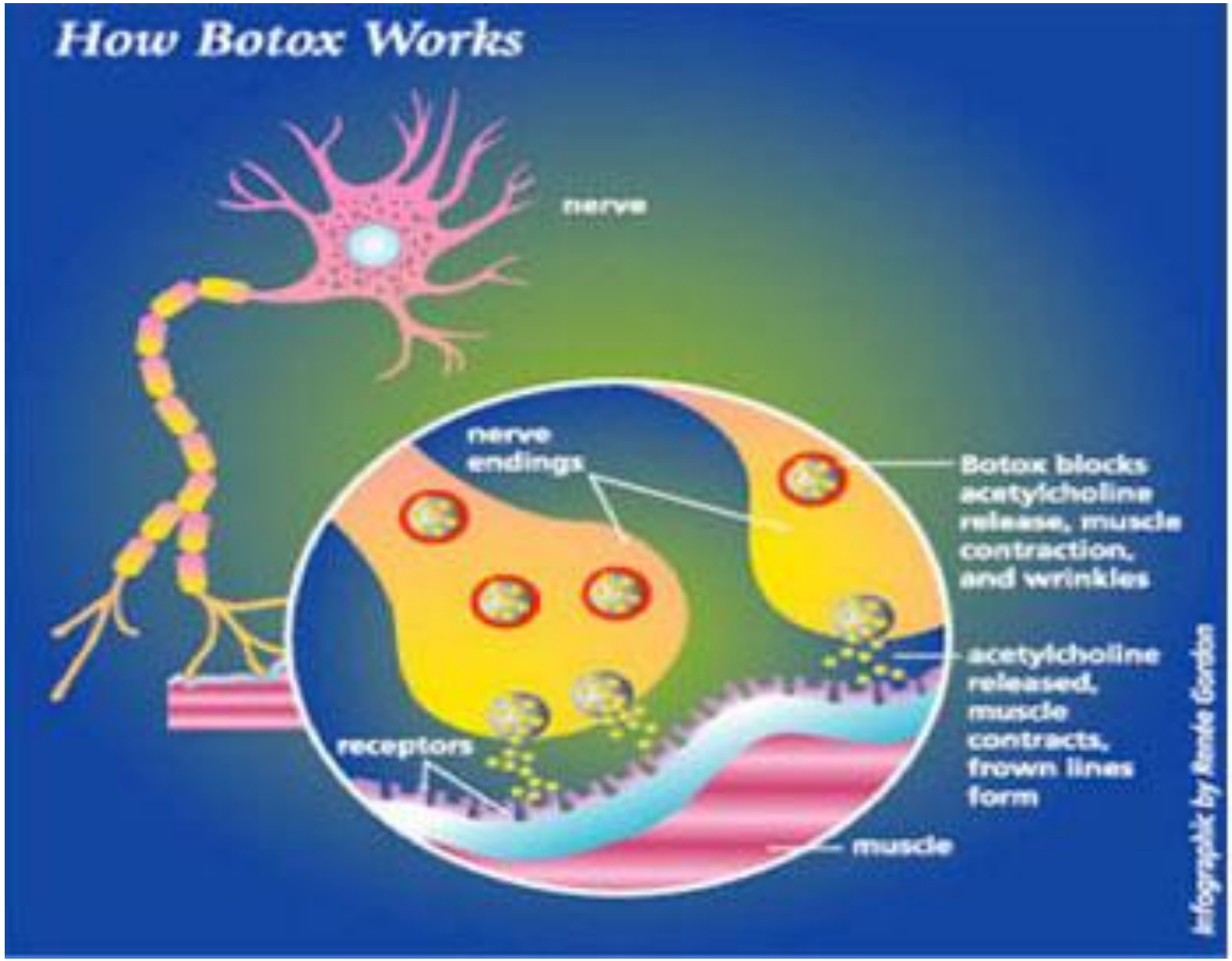
- Oxybutynin ➔ 最舊(Ditropan)，IR副作用多，ER副作用明顯少，mild selective ➔ 後續有貼片，gel等劑型
- Tolterodine ➔ 第一個針對OAB 的anti-M，non-selective, 但organ specific, 人體實驗副作用少, 但長期須注意cognitive function
- Propiverine ➔ non-selective, but less effective in M2 ➔ safe in heart disease ➔ α1-blockade effects
- Trospium ➔ non-selective，四級胺，避免CNS problem
- Darifenacin: 最專一
- Solifenacin ➔ selective，效果強，副作用可能強
- Fesoterodin: 最新，8mg比4mg效果好，但副作用顯著上升

TABLE 1 EC_{50} values for cAMP formation by β_3-adrenoceptor (AR) agonists in CHO cells transfected with human β-adrenoceptor subtypes

Drugs	EC_{50}			References
	β_1-AR (nM)	β_2-AR (nM)	β_3-AR (nM)	
Mirabegron (YM-178)	>10,000	>10,000	22.4	Takasu et al. (2007)
Ritobegron (KUC-7483)	22,000	2,300	73	Maruyama et al. (2012)
Solabegron (GW427353)	3,980	1,260	123.98	Uehling et al. (2006)
Vibegron (MK-4618)	>20,000	>20,000	1.1	Edmondson et al. (2016)

- Mirabegron ➔ effective in numerous randomized placebo-controlled studies, FDA approved
- Ritobegron ➔ ineffective in Phase III study, withdrawn
- Solabegron ➔ effective in phase II, phase III ongoing
- Vibegron ➔ effective in phase III, not show effects on cytochrome P450 enzymes

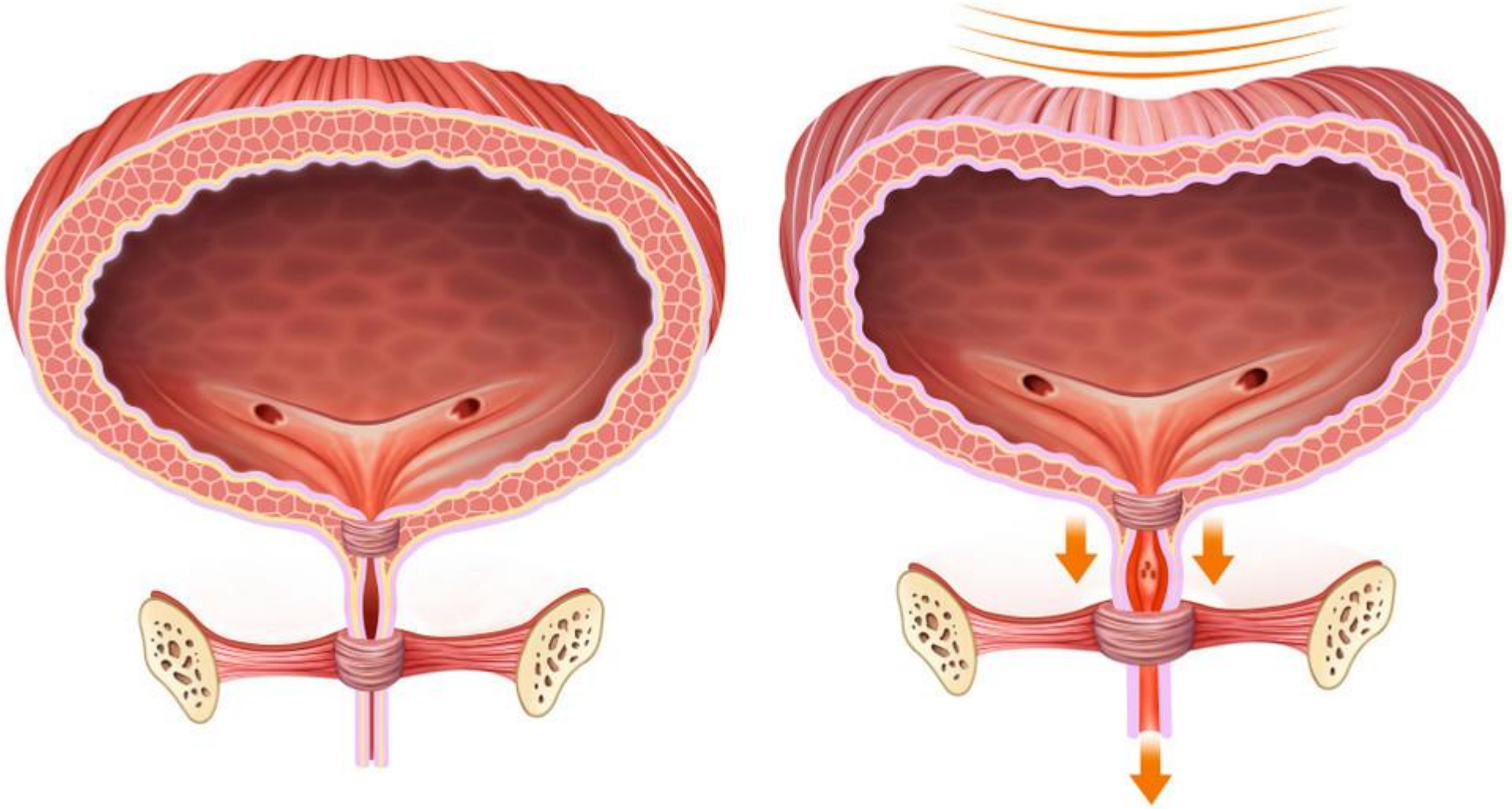
Botulinum toxin for OAB



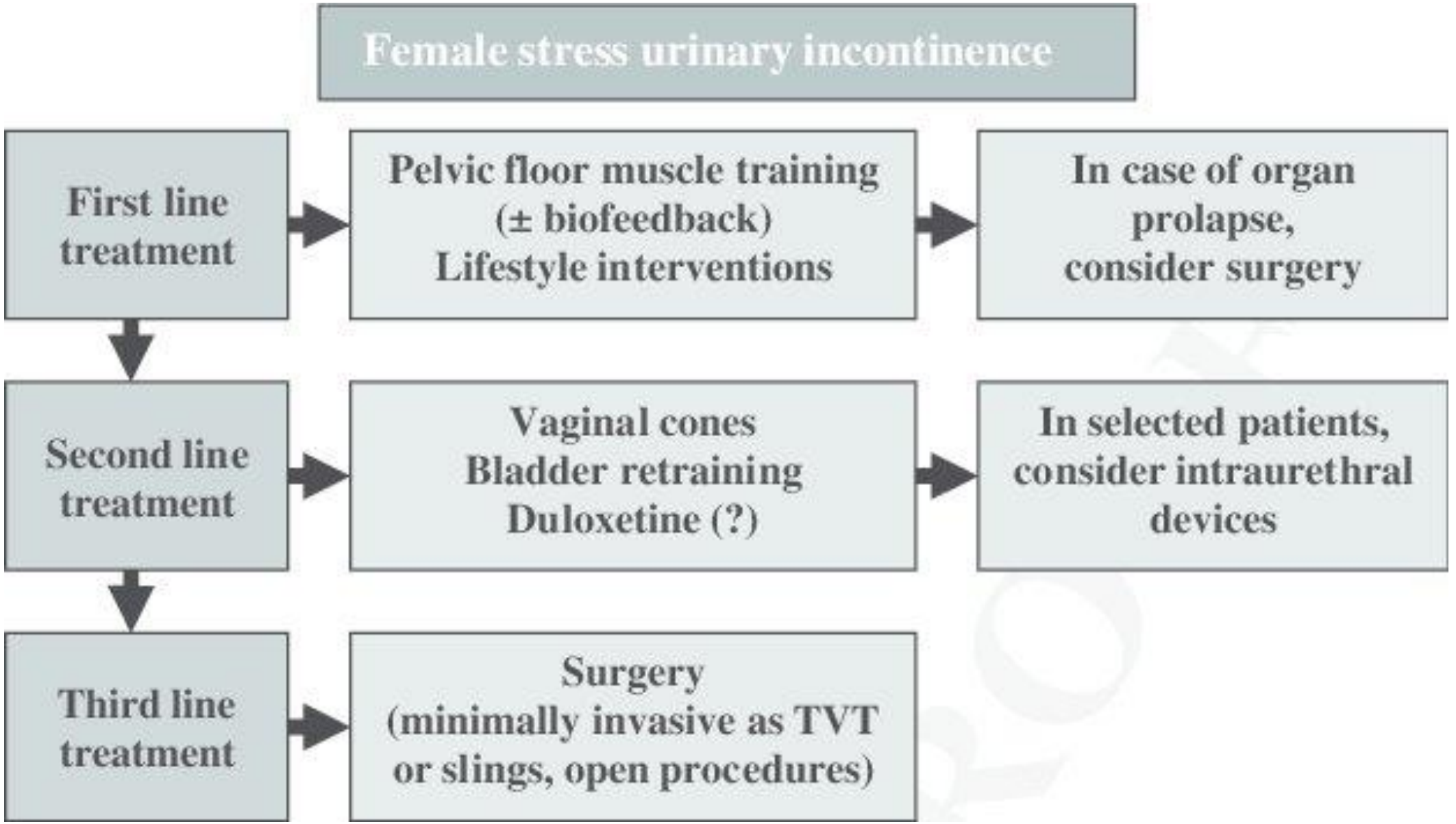
STRESS URINARY INCONTINENCE

TABLE 115.1 Lower Urinary Tract Symptom Definitions

SYMPTOM	DESCRIPTION
Stress urinary incontinence	Complaint of involuntary urinary loss with physical exertion, sneezing/coughing, or other activities raising intra-abdominal pressure
Urgency urinary incontinence	Complaint of involuntary urinary loss associated with sensation of urgency
Mixed urinary incontinence	Complaint of involuntary urinary loss associated with physical exertion/rise in intra-abdominal pressure *and* with urgency
Nocturnal enuresis	Complaint of involuntary urine loss during sleep
Continuous urinary incontinence	Complaint of continuous urine loss, day and night
Insensible urinary incontinence	Complaint of urine loss without knowledge of what precipitated the event or when it occurred
Urinary frequency	Complaint that micturition occurs more frequently than deemed normal
Urinary urgency	Complaint of sudden compelling desire to urinate that is difficult to defer
Overactive bladder syndrome	Complaint of urinary urgency, with or without urgency incontinence, typically with frequency and nocturia
Nocturia	Complaint of interruption of sleep resulting from the need to void, where the interruption is preceded and followed by sleep



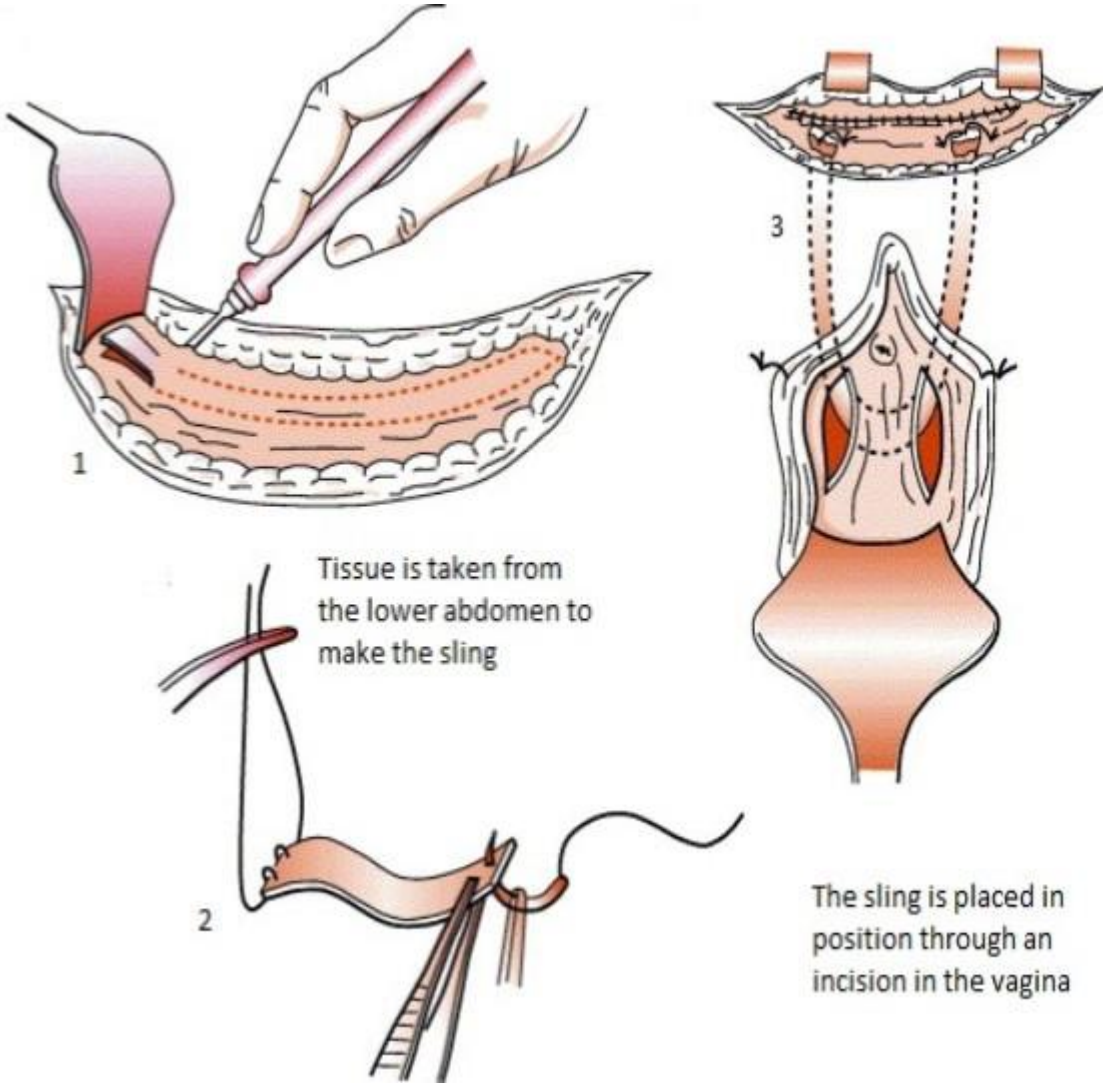
- Bladder neck
- Urethral sphincter
- Pelvic floor


Female stress urinary incontinence
First line treatment
Pelvic floor muscle training (± biofeedback) Lifestyle interventions
In case of organ prolapse, consider surgery
Second line treatment
Vaginal cones Bladder retraining Duloxetine (?)
In selected patients, consider intraurethral devices
Third line treatment
Surgery (minimally invasive as TVT or slings, open procedures)

Kegel exercise

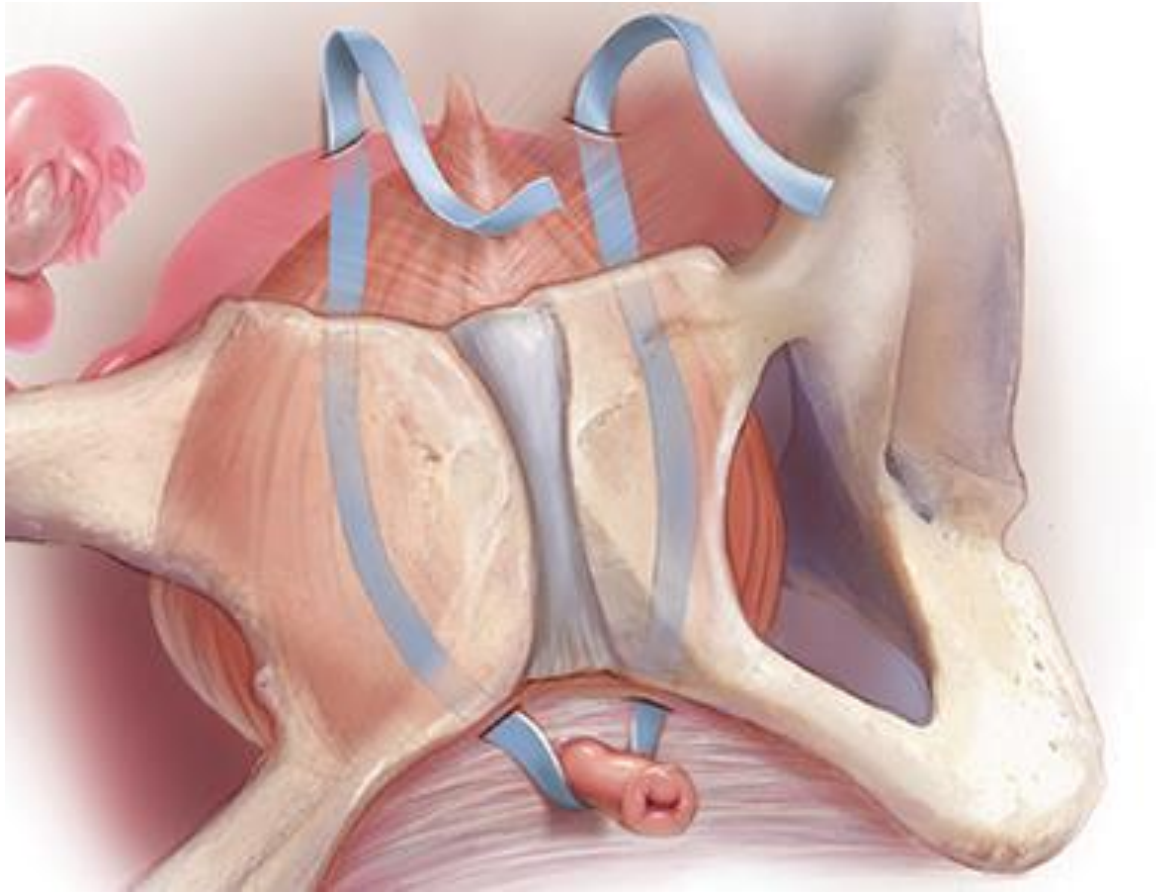
Pubovaginal sling

- Autologus fascia sling



Pubovaginal sling

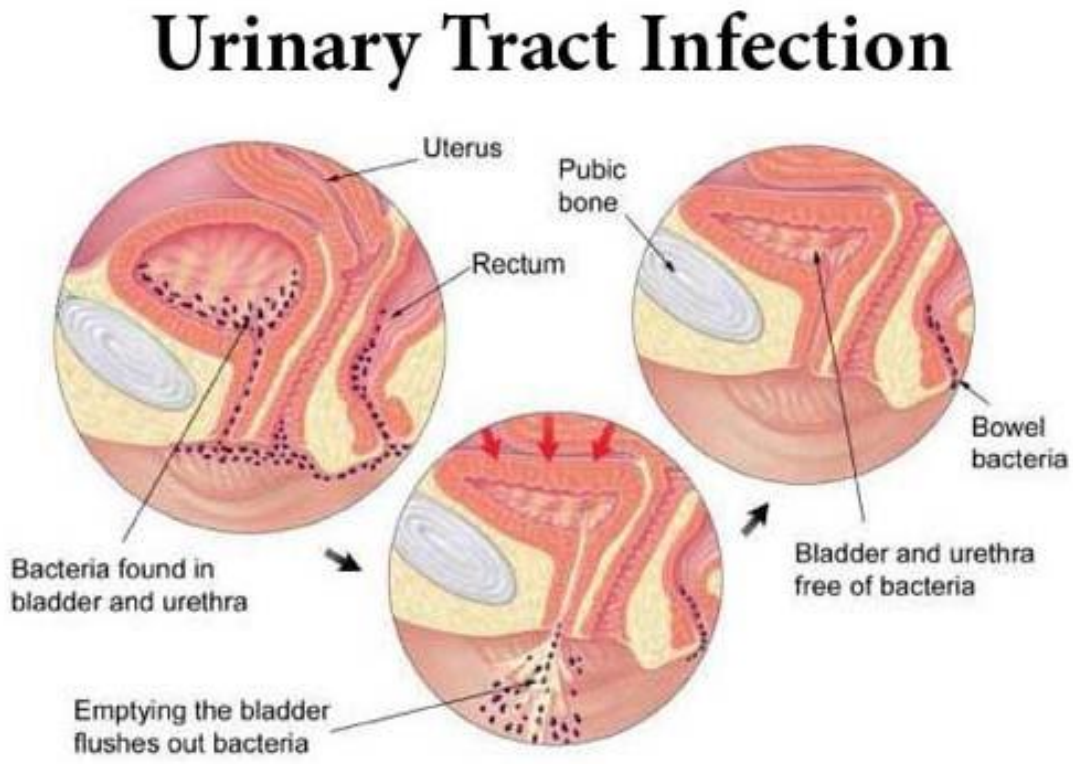
- Synthetic mesh
- Risk of mesh infection and erosion and chronic pelvic pain



RECURRENT UTI

Definition

- Recurrent urinary tract infection (UTI) refers to ≥2 infections in six months or ≥3 infections in one year



Diagnosis	Most frequent pathogen/species
Cystitis acute, sporadic and uncomplicated	• *E. coli* • *Klebsiella* • *Proteus* • Staphylococci
Pyelonephritis acute, uncomplicated (usually febrile)	• *E. coli* • *Proteus* • *Klebsiella* • Other enterobacteria • Staphylococci
UTI with complicating factors (febrile)	• *E. coli* • Enterococci • *Pseudomonas* • Staphylococci
Nosocomial UTI	• *Klebsiella* • *Proteus*
Pyelonephritis severe acute, complicated	• *Enterobacter* • Other enterobacteria • *(Candida)*

TABLE 1

Risk Factors for Recurrent UTIs in Women

Modifiable	Nonmodifiable
Premenopausal women	
Contraceptive use (eg, spermicides, spermicide-coated condoms, oral contraceptives) Intercourse ≥ 4 times/mo	Congenital urinary tract anomalies History of UTI in the patient or her mother Lewis non-secretor blood type Urinary tract obstruction
Postmenopausal women	
Atrophic vaginitis Cystocele Incontinence	Catheterization Declining functional status History of premenopausal UTI Incomplete emptying
Not proven to be associated with UTI	
BMI Bubble baths Caffeine consumption Chronic disease	Douching Noncotton underwear Postcoital voiding habits Sexually transmitted infections

Treatment of rUTI

	Duration	Treatment options	Dose	Frequency
Continuous prophylaxis	3–6 months	Trimethoprim	150 mg	At night
		Cephalexin	250 mg	At night
		Nitrofurantoin*	50 mg	At night
		Trimethoprim + sulphamethoxazole	160/800 mg	At night
Self start therapy	3 days	Trimethoprim	300 mg	At night
	5 days	Cephalexin	500 mg	12 hourly
	3–5 days	Nitrofurantoin	50 mg	6 hourly
	5 days	Amoxycillin + clavulanate	500/125 mg	12 hourly
	3 days	Norfloxacin	400 mg	12 hourly
Post-intercourse	Single dose	Trimethoprim	150 mg	
	Single dose	Cephalexin	250 mg	
	Single dose	Nitrofurantoin	50 mg	
	Single dose	Trimethoprim + sulphamethoxazole	160/800 mg	

Prophylaxis

Type of antibiotics	Dosage	Frequency
TMP-SMX	40 mg/200 mg	Daily or 3x/ week
Nitrofurantoin macrocrystal[a)]	50-100 mg	Daily
Cefaclor	250 mg	Daily
Fosfomycin	3 g every 10 d	3 g every 10 d

UTI: urinary tract infection, TMP-SMX: trimethoprim-sulfamethoxazole.
[a)]Not available in Korea as of April 2017.

UTI Vaccines currently in development

- **Urovac®** (SolcoBasel, Basel, Switzerland and Protein Express, Cincinnati, OH)
- **Uro-Vaxom®** (OM Pharma, Myerin, Switzerland)
- **Urvakol** (Institute of Microbiology; Olomouc, Czech Republic)
- **Urostim** (Bulbio; National Center for Infectious and Parasitic Diseases, Sofia, Bulgaria)
- **FimCH** (Medimmune, Gaithersburg, MD)

Thanks