AGING & GERIATRIC UROLOGY

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- *Geriatrics* is most commonly used to refer patients ***65*** years of age or older

Physiologic Aging

- Renal blood flow decreases with aging. (GFR) of approximately 10 mL/min per decade, reaching about 50% by age 80.
- Pelvic floor muscle dysfunction is common among elderly women
- Decreased striated muscle density in sphincter can lead to stress UI

LOWER URINARY SYSTEM

- Bladder:
  - The ratio of smooth muscle to collagen of the bladder decreases, which may lead to decreased contractile strength, elasticity and compliance
  - Sensory changes may be caused by alterations in the epithelium and associated receptors and neurotransmitters.
  - Oxidative stress
- Prostate: Male BPH

- In addition to considering overall health status, functional assessment in geriatric patients includes evaluation of ADLs, IADLs, mobility, cognition, and other health domains.

- **Polypharmacy and Medication Optimization**
- A basic principle for prescribing medications in the geriatric patient population is to **“start low and go slow.”**

LOWER URINARY TRACT SYMPTOMS IN GERIATRIC POPULATION

- LUTS are common in elderly
- Nocturia is the most bothersome LUTS
- Prevalence of nocturia increases to 80% in patients aged over 80 years
- Nocturia is one of the most common causes of disturbed sleep pattern

PREVALENCE OF OAB INCREASED BY AGE

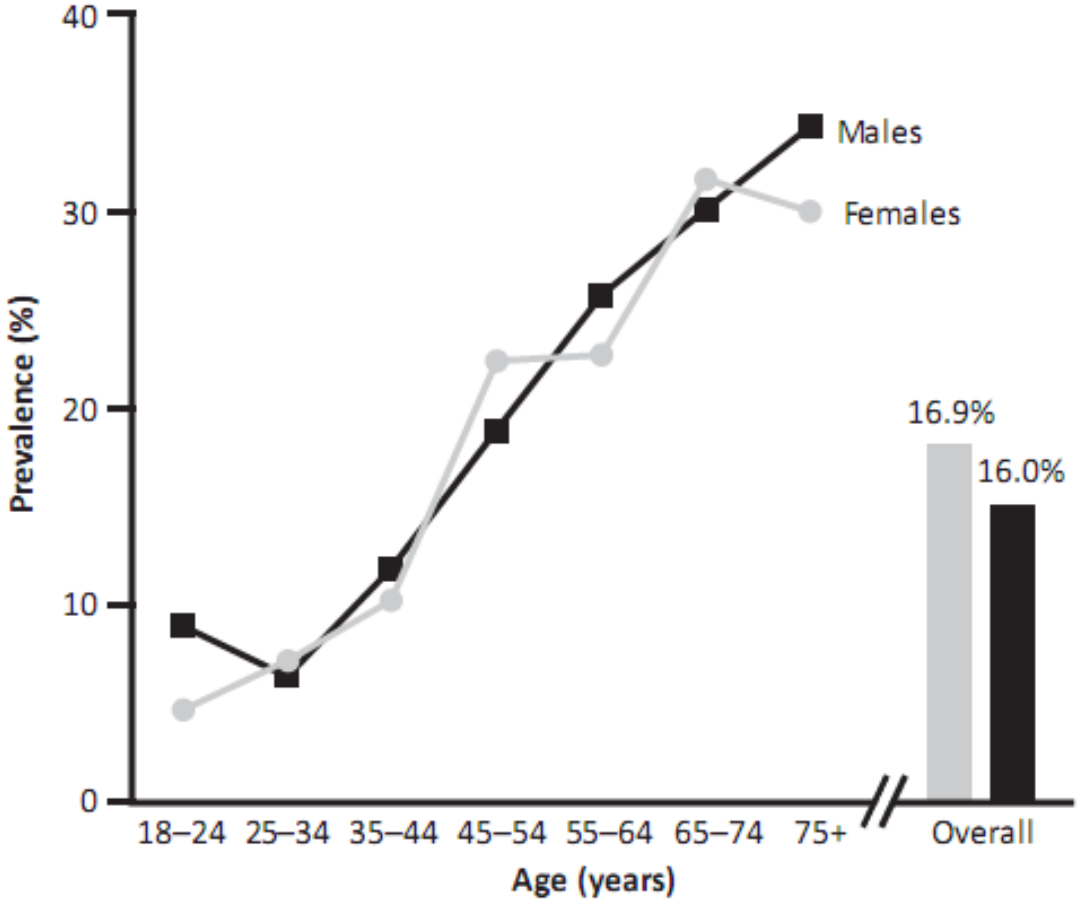


Fig. 1. Prevalence of OAB, according to age and gender (reproduced with permission from Ref. 7).

Neurourol Urodyn. 2014 Jul;33 Suppl 3:S2

OVERACTIVE BLADDER_ TREATMENT BY AUA/ SUFU GUIDELINE

- **1st line: Behavior therapies:**
  - bladder training
  - bladder control strategies
  - pelvic floor muscle training
  - fluid management/ life style modification
    (水分控制，減少咖啡因，減重，避免便秘)
- **2nd line: Pharmacologic management**
  - **Oral anti-muscarinics**
    Oral β3-adrenoceptor agonists

J Urol. 2015 May;193(5):1572

OAB_ TREATMENT BY AUA/ SUFU GUIDELINE

- **3rd line:** refractory to 1st & 2nd line treatment
  - Intravesical onabotulinumtoxinA (BoNT-A)
  - Peripheral tibial nerve stimulation (PTNS)
  - Sacral neuromodulation (SNS)

- **Additional Treatments**
  - Augmentation cystoplasty or urinary diversion for severe, refractory, complicated OAB patients. (Expert Opinion)

NOCTURIA OF ELDERLY

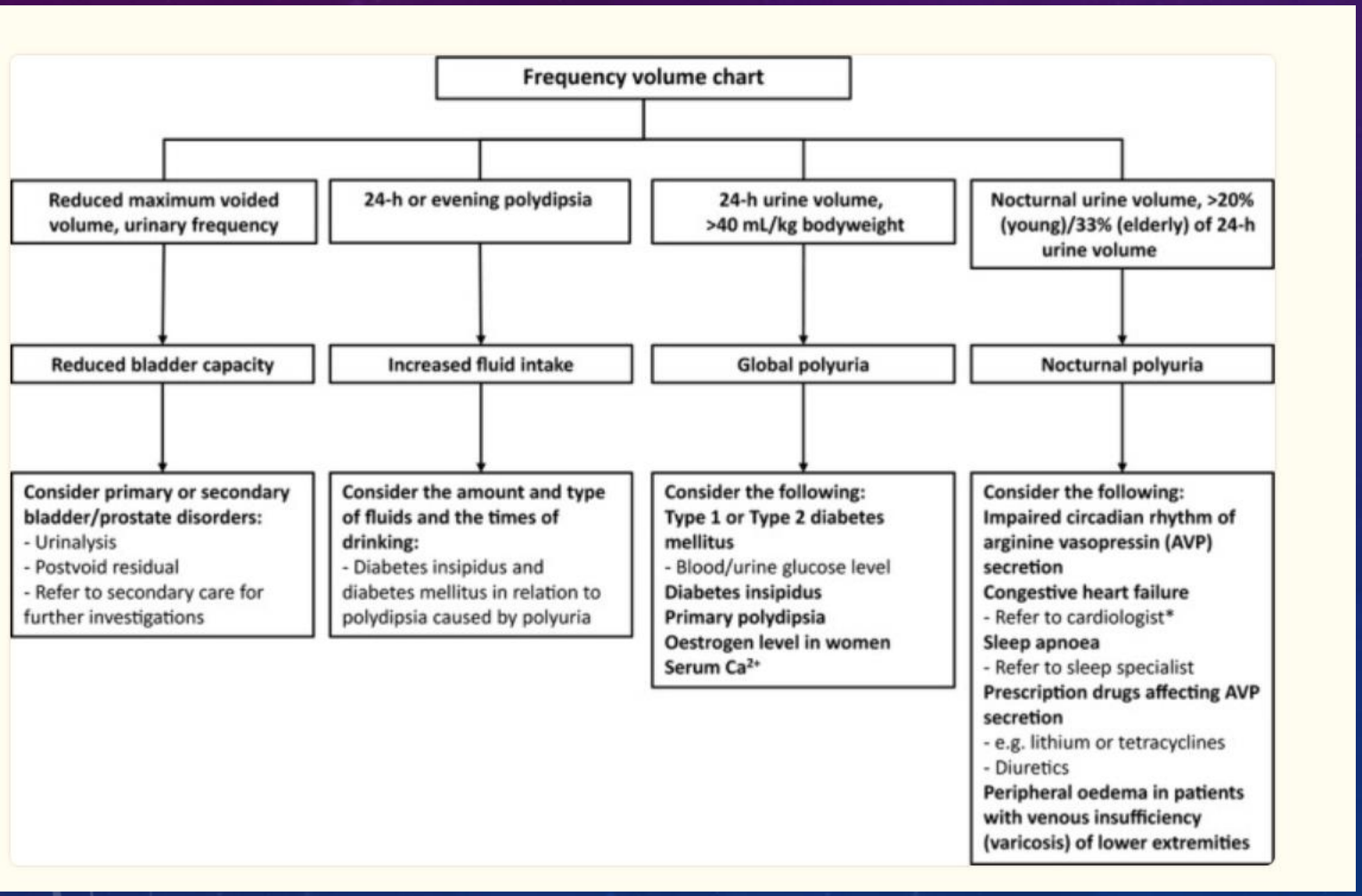
- The impact on QoL comes primarily from disturbed sleep caused by nocturia, which can lead to sleep deprivation, especially when there is difficulty in returning to sleep.
- The negative effect of nocturia on sleep outcomes appears to be stronger in adults aged >65 years
- It is also an important cause of falls and fall-related fractures in the elderly population.

- *Clin Ther*. 2016;38:2386-2393
- *Neurourol Urodyn*. 2014;33:S10-S14.

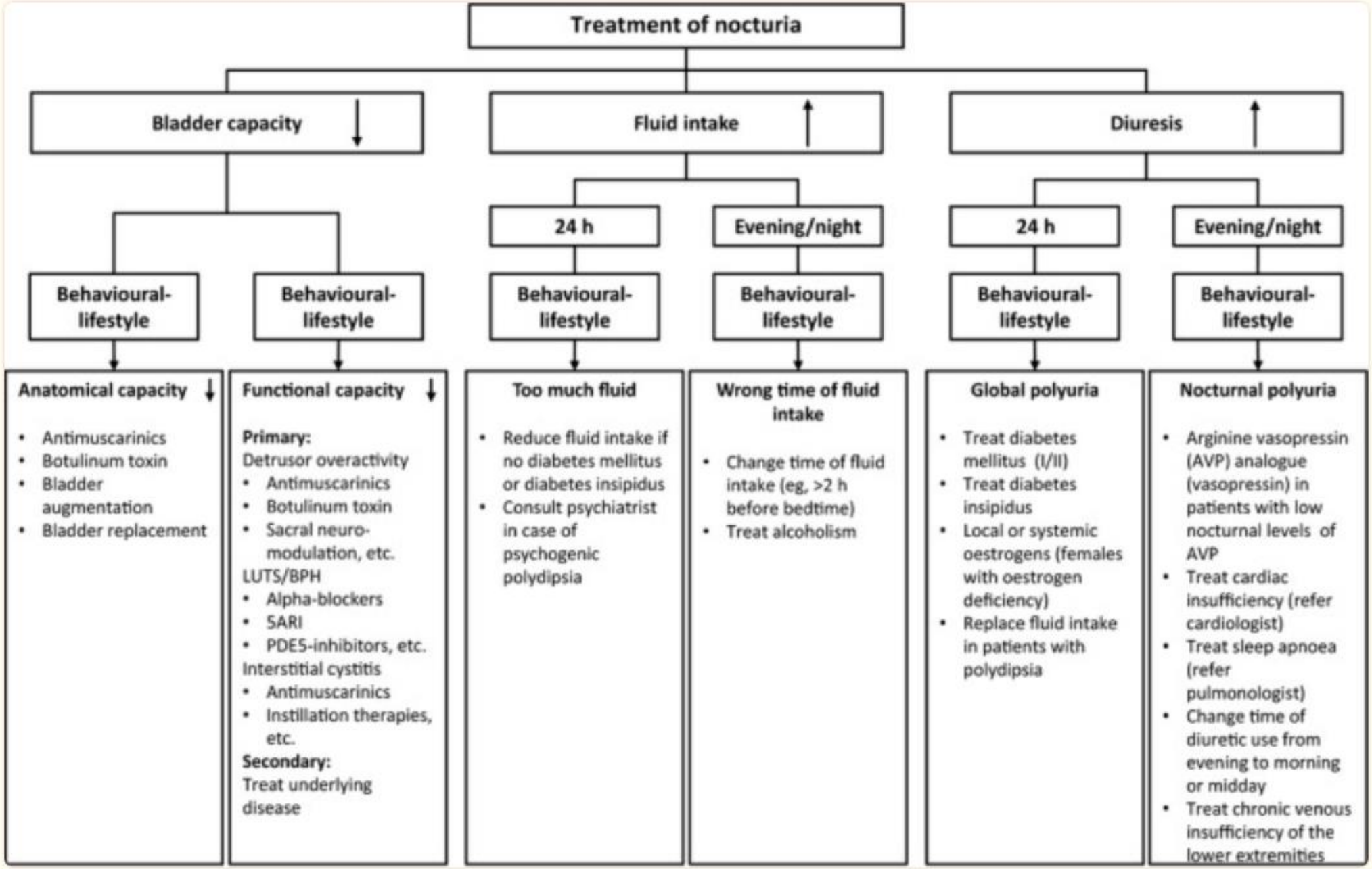
- A population-based epidemiologic survey also found a strong association of nocturia with depression in both men and women, with a significant trend in increased odds of depression
- Nocturia (≥2 voids per night) has been found to increase the mortality risk by 54% in men (hazard ratio [HR] 1.54, 95% confidence interval [CI] 1.18-2.00) and by 28% in women (HR 1.28, 95% CI 1.04-1.57)

- *Eur Urol*. 2012;61:78-84.
- *J Urol*. 2011;185:571-577.

ASSESSMENT OF PATIENTS WITH NOCTURIA



- Int J Clin Pract. 2017 Nov; 71(11): e13027.


Treatment of nocturia
Bladder capacity
Fluid intake
Diuresis
24 h
Evening/night
24 h
Evening/night
Behavioural-lifestyle
Behavioural-lifestyle
Behavioural-lifestyle
Behavioural-lifestyle
Behavioural-lifestyle
Behavioural-lifestyle
Anatomical capacity
• Antimuscarinics
• Botulinum toxin
• Bladder augmentation
• Bladder replacement
Functional capacity
Primary:
Detrusor overactivity
• Antimuscarinics
• Botulinum toxin
• Sacral neuro-modulation, etc.
LUTS/BPH
• Alpha-blockers
• SARI
• PDE5-inhibitors, etc.
Interstitial cystitis
• Antimuscarinics
• Instillation therapies, etc.
Secondary:
Treat underlying disease
Too much fluid
• Reduce fluid intake if no diabetes mellitus or diabetes insipidus
• Consult psychiatrist in case of psychogenic polydipsia
Wrong time of fluid intake
• Change time of fluid intake (eg, >2 h before bedtime)
• Treat alcoholism
Global polyuria
• Treat diabetes mellitus (I/II)
• Treat diabetes insipidus
• Local or systemic oestrogens (females with oestrogen deficiency)
• Replace fluid intake in patients with polydipsia
Nocturnal polyuria
• Arginine vasopressin (AVP) analogue (vasopressin) in patients with low nocturnal levels of AVP
• Treat cardiac insufficiency (refer cardiologist)
• Treat sleep apnoea (refer pulmonologist)
• Change time of diuretic use from evening to morning or midday
• Treat chronic venous insufficiency of the lower extremities

BENIGN PROSTATIC HYPERPLASIA IN ELDERLY

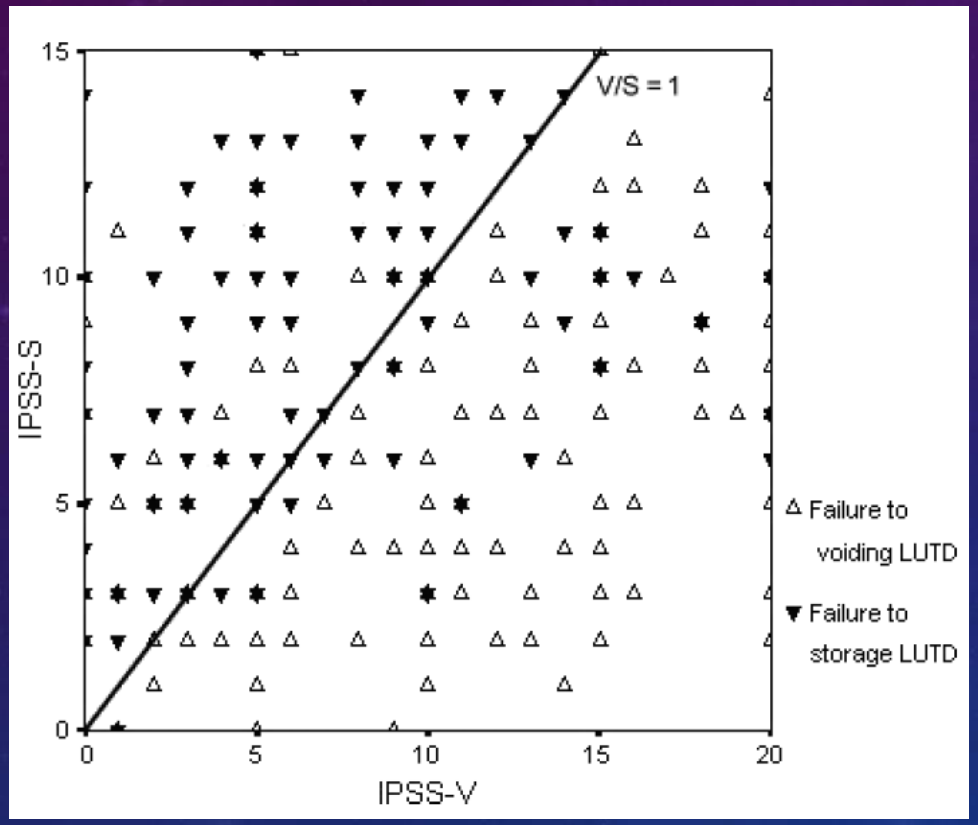
- They mainly affect older men, with prevalence increasing with age: on average, 50% of men over 60 years of age and 80% of men over 80 years of age experience LUTS caused by BPH
- Classifying the low urinary symptoms (LUTS) into storage and voiding symptoms is helpful for the choice of drug therapy.

International Prostate Symptom Score (IPSS)

國際前列腺症狀積分表（IPSS）							
	完全沒有	五次內不到一次（偶爾）	不超過一半（三不五時）	大約一半（一半一半）	超過一半次數（經常）	都是如此（總是）	症狀的評分
1. 在過去一個月內，你是否有小便解不乾淨的感覺？ Incomplete emptying	0	1	2	3	4	5	
2. 在過去一個月內，你是否不到兩小時還要再去小便一次？ Frequency	0	1	2	3	4	5	
3. 在過去一個月內，你是否有小便斷斷續續的現象？ Intermittency	0	1	2	3	4	5	
4. 在過去一個月內，你是否有憋不住尿的感覺？（尿急就憋不住）Urgency	0	1	2	3	4	5	
5. 在過去一個月內，你是否有小便無力的感覺？ Weak stream	0	1	2	3	4	5	
6. 在過去一個月內，你是否有需要用力才能解出小便？Straining	0	1	2	3	4	5	
	完全沒有	一次	二次	三次	四次	五次或以上	
7. 在過去一個月內，晚上睡覺時您一般需要起床小便幾次？ Nocturia	0	1	2	3	4	5	
症狀計分的總評分：							
因泌尿系統疾病的症狀而影響了生活品質							
	非常滿意	滿意	還算滿意	無所謂	不大滿意	不滿意	非常不滿意
如果您以後日常生活的小便情形都和現在一樣，你會覺得如何？	0	1	2	3	4	5	6

- 8 items: **7 symptom questions** + 1 QoL (quality of life) question
  - 0 point: asymptomatic
  - **1-7** points: mildly symptomatic
  - **8-19**: moderately symptomatic
  - **20-35** points: severely symptomatic
- 4 **v**oiding items, 3 **s**torage items
- During assessment, during and/or after treatment

IPSS V/S (VOIDING/ STORAGE SUBSCORE RATIO): USEFUL METHOD TO DIFFERENTIATE MALE LUTD



	Failure to voiding LUTD		Failure to storage LUTD	
	ROC area	95% CI	ROC area	95% CI
IPSS-T	0.58	0.51–0.65	0.43	0.36–0.50
IPSS-V	0.72	0.66–0.78	0.71	0.65–0.77
IPSS-S	0.67	0.60–0.74	0.68	0.61–0.74
IPSS-V/S	0.81	0.75–0.87	0.80	0.75–0.86
TPV	0.74	0.65–0.79	0.72	0.66–0.78
Qmax	0.64	0.57–0.71	0.63	0.56–0.70
PVR	0.63	0.57–0.70	0.63	0.56–0.70

	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
IPSS-V/S				
≥ 0.6	85.7	45.7	61.0	76.3
≥ 0.8	81.8	61.4	67.8	77.2
≥ 1.0	80.2	69.3	72.1	77.9
≥ 1.2	72.2	85.0	82.7	75.5
≥ 1.4	65.9	89.0	85.4	72.0

Int J Clin Pract. 2012 Feb;66(2):139

TREATMENT OF BPH

- The primary main factor on which treatment decisions are based is the patient's subjective perception of symptom burden, which can best be captured by the IPSS and Quality of Life (QoL) score.

- lifestyle changes can improve BPH-related symptoms
  - Avoiding alcohol and caffeine
  - Adapting fluid intake to daily routine
  - Ongoing monitoring of symptoms
  - Using relaxation exercises and distraction techniques

PHARMACOLOGICAL TREATMENT FOR BPH

- 1. α1-Adrenoceptor antagonists (α1-blockers): relax smooth muscle cells in the prostate urethra
- 2. 5α-reductase inhibitors:
  inhibit dihydrotestosterone (DHT) production, which is converted from testosterone
- 3. Phosphodiesterase 5 inhibitors:
  reduce smooth muscle tone of the detrusor, prostate and urethra, and seams seems to increase blood perfusion and oxygenation

前列腺肥大手術適應症

- 藥物治療無效
- 反覆尿液滯留
- 膀胱結石
- 反覆尿路感染
- 前列腺肥大引起的血尿
- 腎功能受損(腎水腫)

攝護腺肥大手術治療

- Gold standard: Transurethral resection of prostate (TUR-P): monopolar
  - 目前遇到的缺點：bleeding
  - Fluid intake, electrolyte imbalance (hyponatremia: TUR syndrome)
- Bipolar TUR-P
- Laser TUR-P
  - 綠光雷射汽化術
  - 銩雷射
  - 多波光雷射

SURGICAL TREATMENT FOR BPH

Procedure	Prostate size, symptom burden
Transurethral incision of the prostate (TUIP)	<30 ml, moderate–severe
Monopolar or bipolar transurethral resection of the prostate (M-TURP)	30–80 mL, moderate–severe
Bipolar transurethral prostateresection (TURP)	30–80 mL, moderate–severe
Bipolar vaporization of the prostate (TUVP)	30–80 mL, moderate–severe
Open simple prostatectomy	>80 mL, moderate–severe
Endoscopic enucleation of the prostate	>80 mL, moderate–severe
Green light laser vaporization of the prostate(80 W, 120 W KTP)	30–80 mL, moderate–severe
Laser vaporization of the prostate 120 W, 980 nm	30–80 mL, moderate–severe
Thulium laser vaporization of the prostate (ThuVARP)	30–80 mL, moderate–severe

UroLift	30–80 mL, moderate
Laparoscopic/robot-assisted simple prostatectomy	>80 mL, moderate–severe
iTIND (temporarily implanted nitinol device)	<50 ml, moderate
Aquablation	30 – 80 mL, moderate–severe
Rezum	30 – 80 mL, moderate–severe
Prostate artery embolization	30 – 80 mL, moderate–severe

GERIATRIC INCONTINENCE

- Poor cortical perfusion
- Sequale of previous stroke
- Parkinson’s disease
- Benign prostatic obstruction
- Weak urethral striated sphincter
- Loss of cortical arousal of bladder fullness

2. TYPES OF INCONTINENCE BY SYMPTOMATOLOGY

- Transient incontinence
- Urge incontinence
- Stress incontinence
- Overflow incontinence
- Mixed incontinence
- Continuous or total incontinence

TRANSIENT INCONTINENCE (DIAPPERS)

- Delirium
- Infection
- Atrophic vaginitis
- Psychological disorders
- Pharmacological effects
- Excessive urine output
- Restricted motility
- Stool impaction

CAUSE	NOTES
Delirium/confusional state	Results from almost any underlying illness or medication; incontinence is secondary and abates once the cause of confusion has been corrected
Infection—Urinary (only *symptomatic*)	Causes incontinence, but the more common asymptomatic bacteriuria does not
Atrophic urethritis/ vaginitis	Characterized by vaginal erosions, telangiectasia, petechiae, and friability; may cause or contribute to incontinence. Now controversial but may be worth a 3- to 6-month trial of estrogen, especially topical application (if not contraindicated by breast or uterine cancer)
Pharmaceuticals	Includes many prescribed and nonprescribed agents, because incontinence can be caused by diverse mechanisms (see Table 76–2)
Excess urine output	Results from large fluid intake, diuretic agents (including theophylline, caffeinated beverages, and alcohol), and metabolic disorders (e.g., hyperglycemia or hypercalcemia); nocturnal incontinence also may result from mobilization of peripheral edema (e.g., congestive heart failure [CHF], venous insufficiency, drug side effect)
Restricted mobility	Often results from overlooked, correctable conditions such as arthritis, pain, foot problem, postprandial hypotension, or fear of falling
Stool impaction	May cause both fecal and urinary incontinence that remit with disimpaction

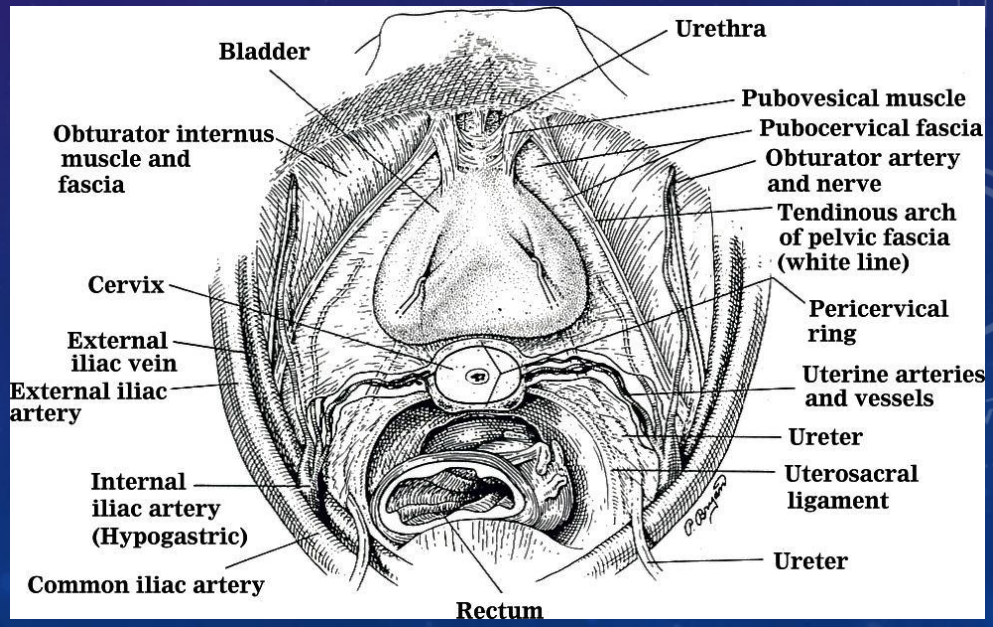
Campbell-Walsh Urology 10th edition. Ch 76

TYPES OF INCONTINENCE BY PATHOPHYSIOLOGY

- Bladder related incontinence
  - Detrusor overactivity
  - Detrusor underactivity & low compliance
- Urethral related incontinence
  - Intrinsic sphincteric deficiency
  - Hypermobility of bladder neck & urethra

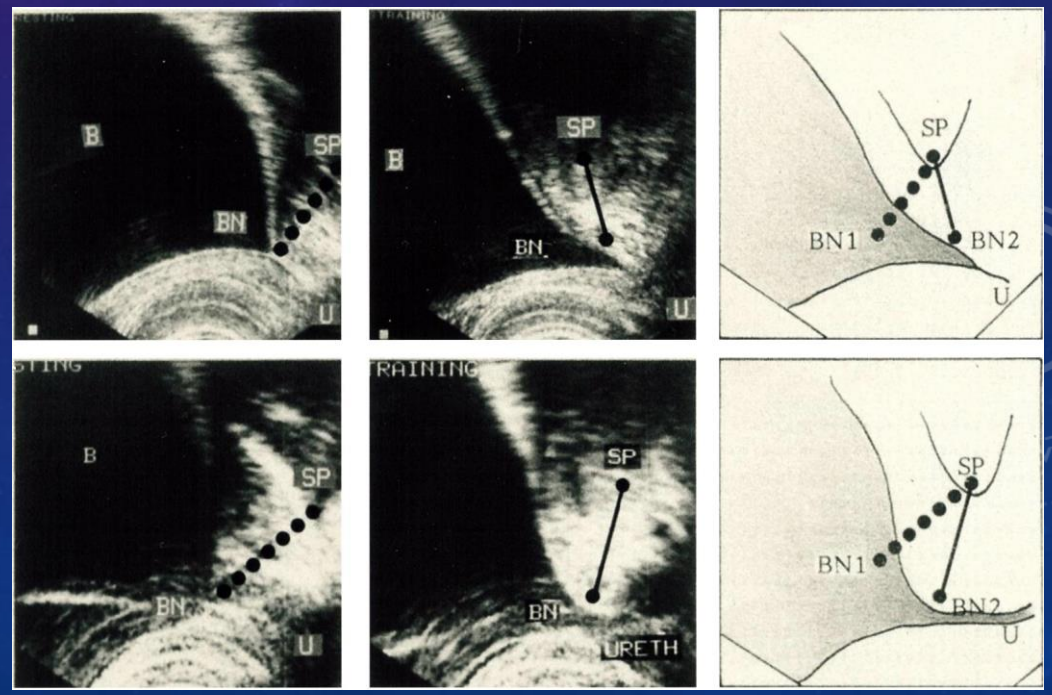
FEMALE STRESS INCONTINENCE

- Extrinsic Continence Mechanism
  - Pubourethral & pubovesical ligaments
  - Pubocervical fascia
  - Attachments to archus tendineus fascia pelvic
  - Vaginal endopelvic fascia
  - Attachments to levator ani
  - Uterosacral ligaments
  - The Levator ani muscles



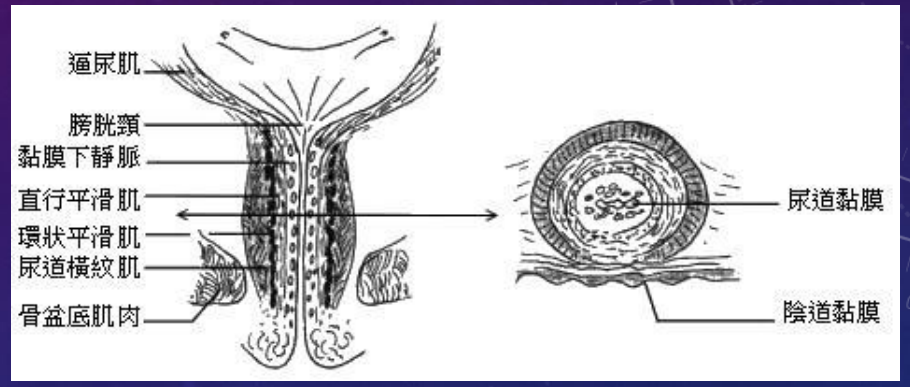
A. DEFECTS IN EXTERINSIC CONTINENCE MECHANISM

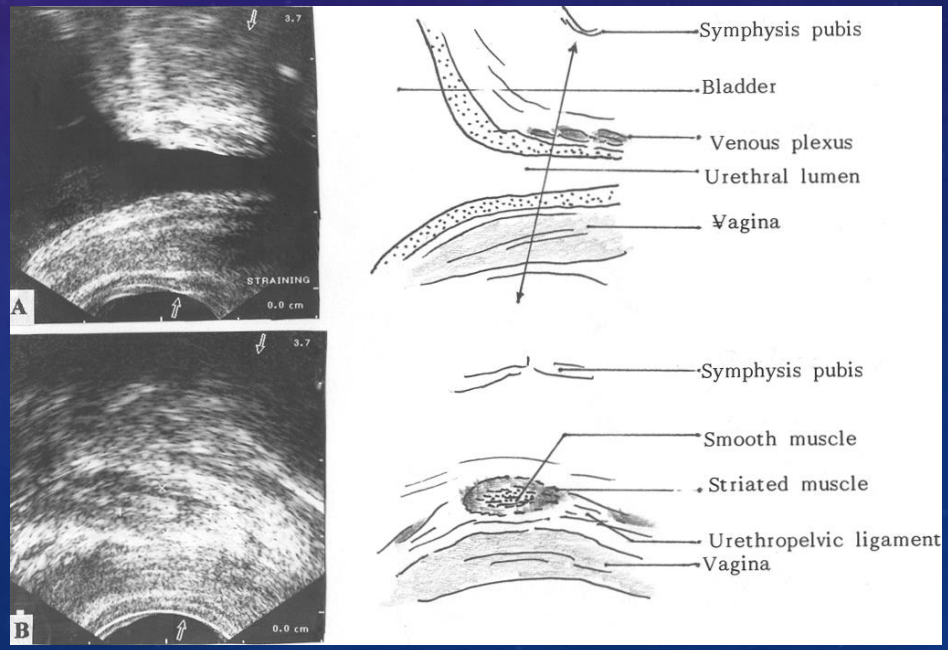
- Hypermobility of Bladder neck and urethra
- Loss of hammock effect during increased abdominal pressure
- Coexisting prolapse



B. INTRINSIC CONTINENCE MECHANISM

- Urethral mucosa
- Submucosal vasculature
- Connective tissue
- Urethral smooth muscles
- Urethral striated muscles





FEMALE SUI TREATMENT OPTIONS

Lifestyle changes

- Pelvic Floor Muscle Exercises (also called Kegel exercises)
- Maintain Good Bowel Function
- Maintaining a Healthy Weight
- Bladder Training
- Quit Smoking

- Surgical treatment

Surgical treatment	Description	Recommended for
Standard		
Midurethral sling	A strap that is placed under the urethra* to provide support, most commonly a synthetic (polypropylene) mesh	Most patients
Burch colposuspension	An operation to support the bladder neck, which connects the bladder to the urethra, to resist pressure	Patients who cannot have a synthetic or midurethral sling
Autologous fascial sling	A strap made from the patient's own body tissue that is placed under the urethra to provide support	Patients who cannot use a synthetic or midurethral sling

THANK YOU FOR YOUR ATTENTION