MUNI
PHARM

URINARY INCONTINENCE
BENIGN PROSTATIC HYPERPLASIA
PADAM SYNDROME

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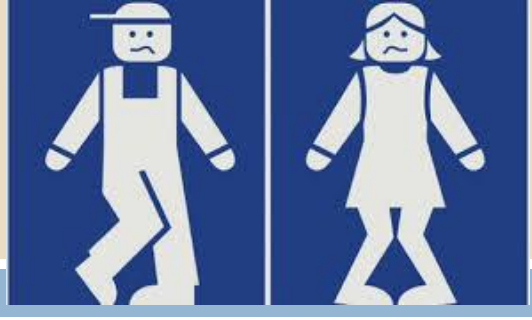
Lecture from Geriatric Pharmacotherapy 5.5. 2023

Urinary incontinence



- **involuntary urination, leakage of urine**

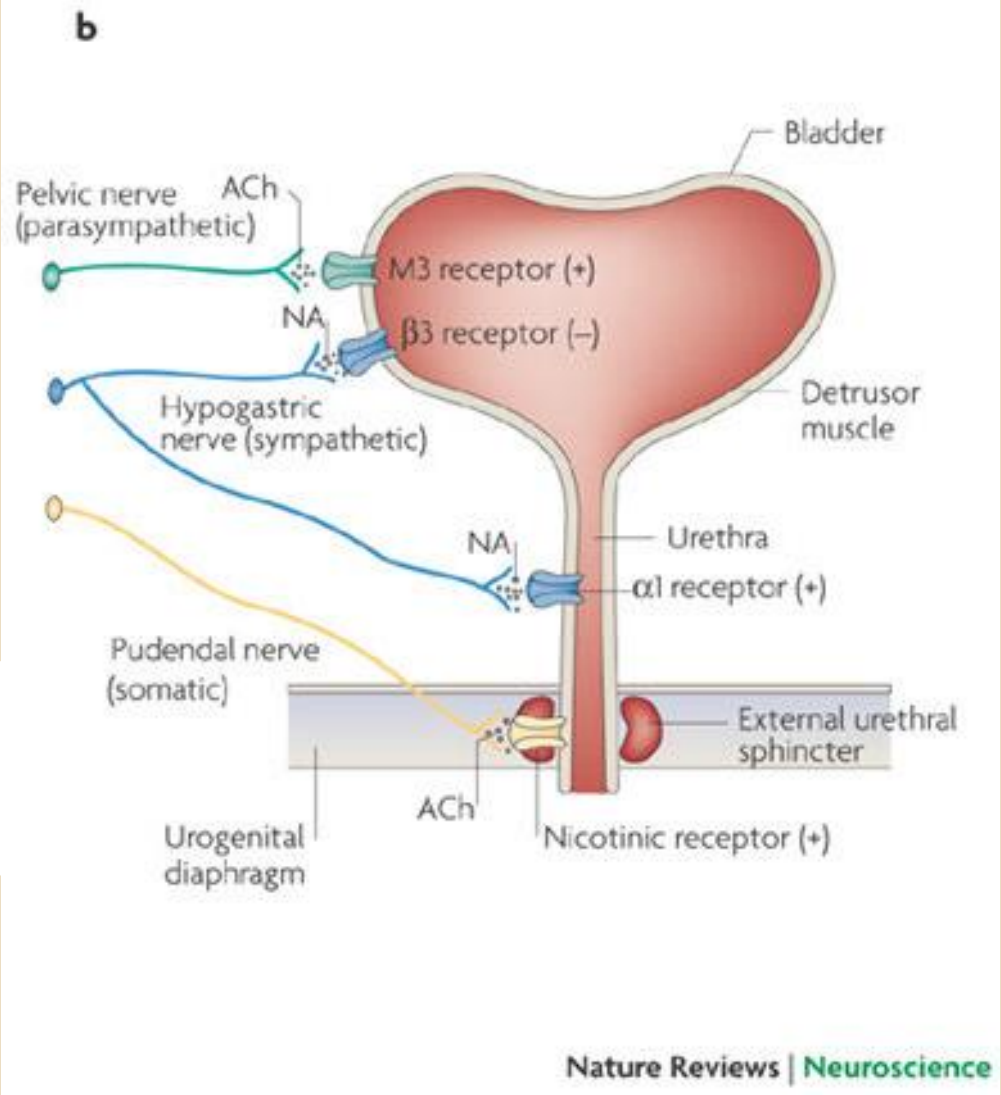
- decrease of urinary bladder capacity
- frequent contractions of detrusor muscle
- worsening of urinary bladder evacuation
- lack of pelvic muscle tone
- postmenopausal mucous membrane changes

Urinary system innervation

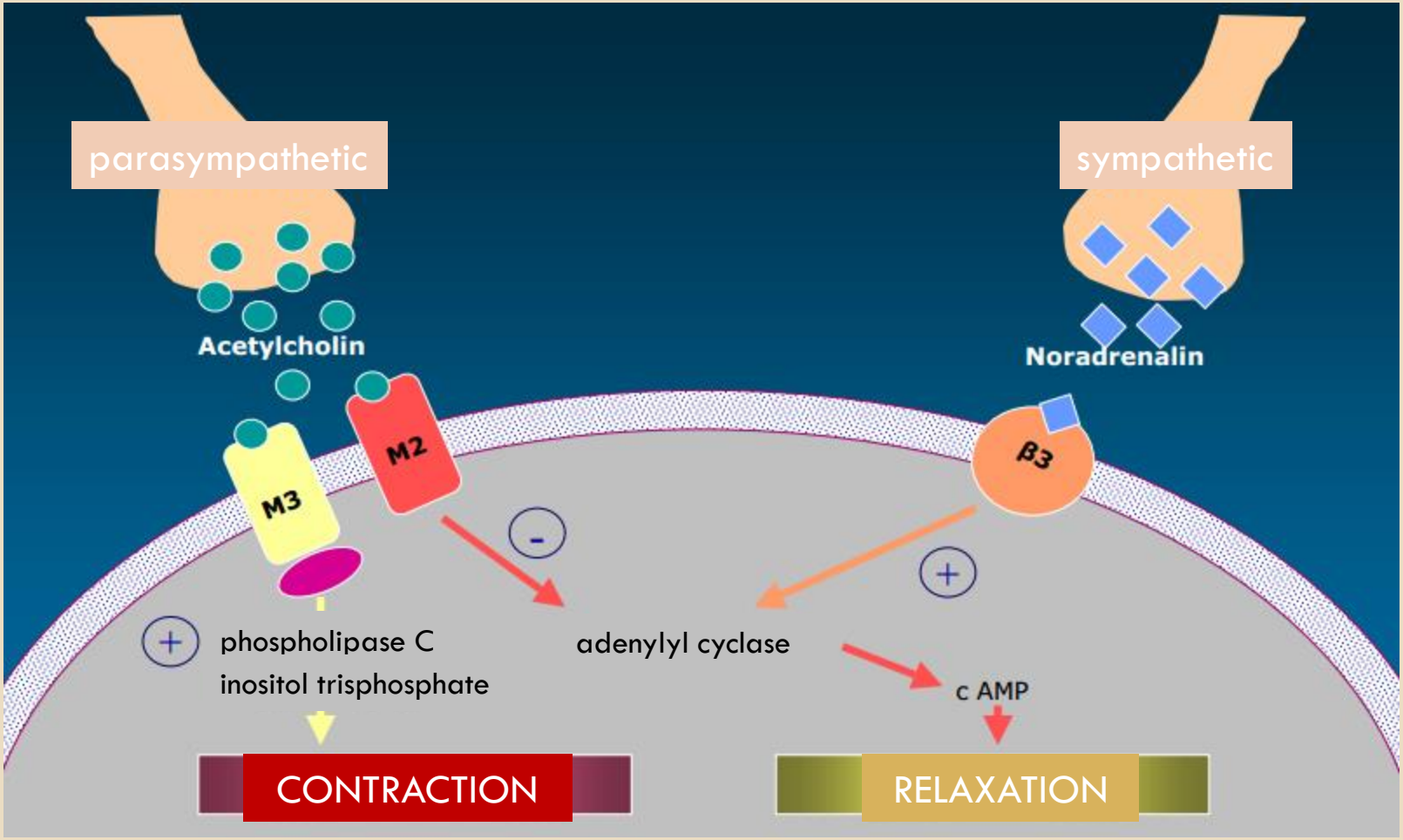
stimulation of the bladder detrusor

detrusor inhibition and urethra smooth muscle stimulation

external urethral sphincter stimulation (striated muscle)



Urinary bladder innervation

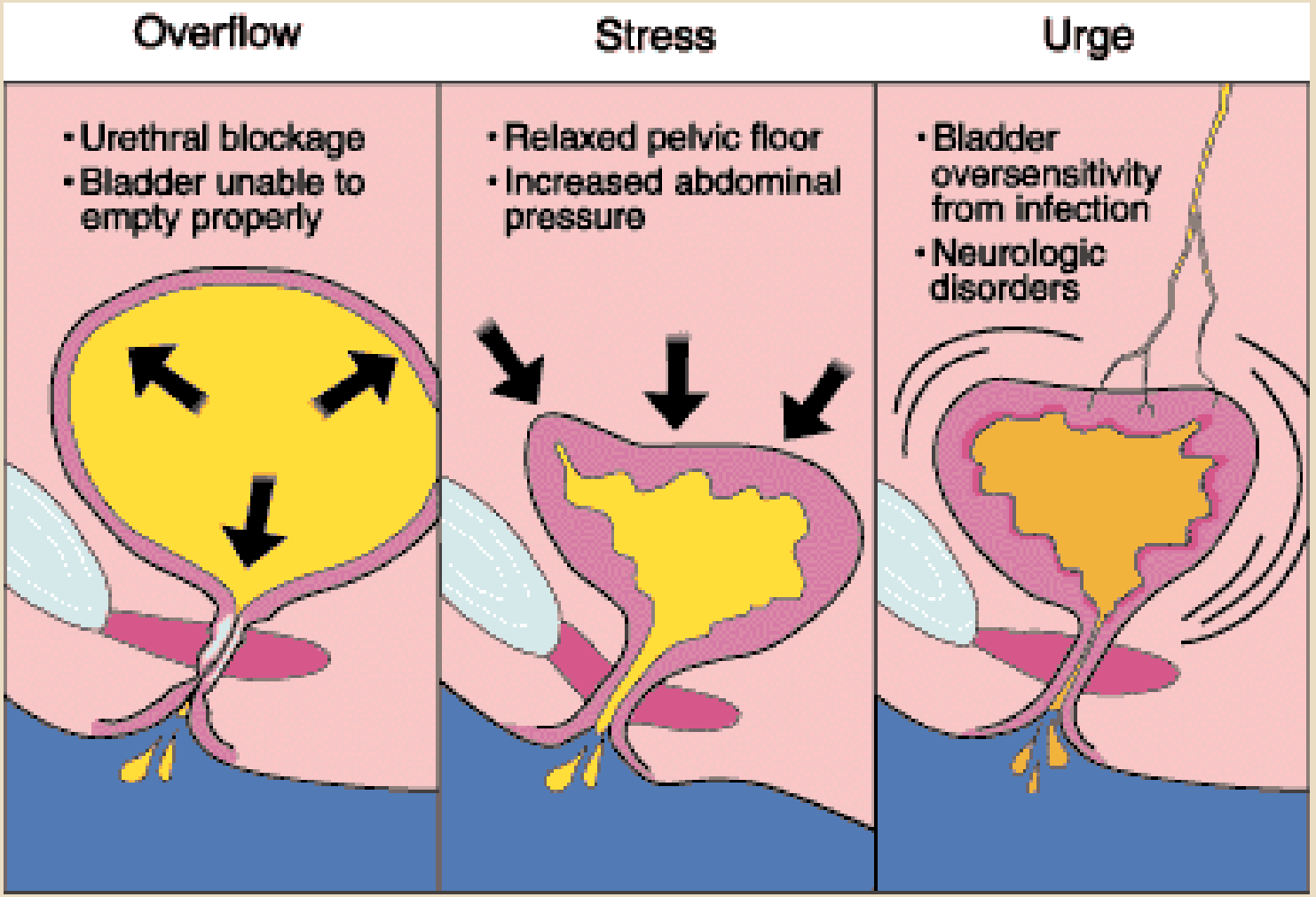


Urinary incontinence

- necessary balance between urethral closure and action of the detrusor muscle of the urinary bladder

- **urination**
  - detrusor muscle in the wall of the bladder contracts, forcing urine out of the bladder and into the urethra
  - sphincter muscle surrounding the urethra relaxes, letting urine pass out of the body
- **incontinence**
  - bladder detrusor muscle suddenly contracts or the sphincter muscle surrounding the urethra suddenly relaxes

Types of incontinence

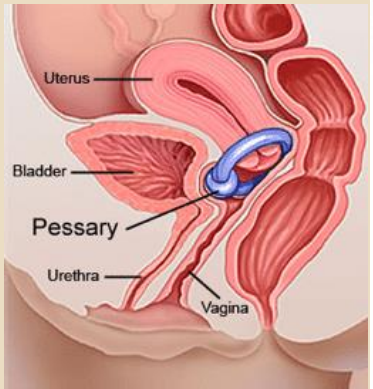


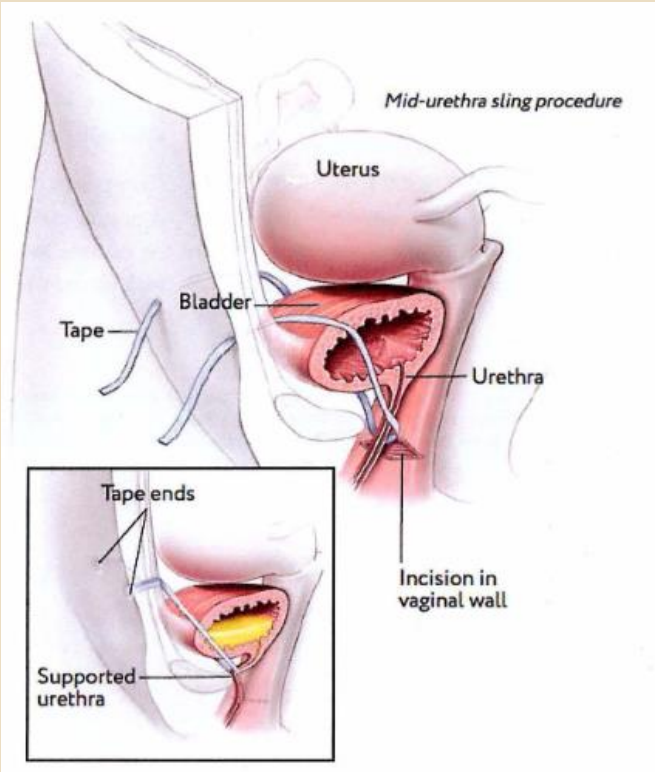
Stress (effort) incontinence

- insufficient strength of the closure of the bladder
- incontinence associated with **coughing, laughing, sneezing, exercising** or other activities increasing intraabdominal pressure thus increasing pressure on the bladder
- **mainly in women**
  - physical changes resulting from pregnancy, childbirth, and menopause
  - obesity

Stress incontinence therapy

- **reduction of body weight**
- **exercises** focused on pelvic muscles strenghtening
  - Kegel's exercises
- **electrostimulation**
- **diaphragms (pessaries)**
- **surgery**
  - transvaginal tapes (tension-free)
- **incontinence devices**





Stress incontinence therapy

Pharmacotherapy

- **direct alpha (α_1) sympathomimetics**
  - increase smooth muscle tone in the urethra
  - midodrine
    - **AEs:** headache, anxiety, hypertension, confusion
- **antidepressants**
  - increase urethral pressure and bladder capacity by adrenergic stimulation
    - TCA (imipramin, dosulepin)
    - SNRI (duloxetine)
- **local estrogen therapy**
  - improvement of atrophy of the urogenital system

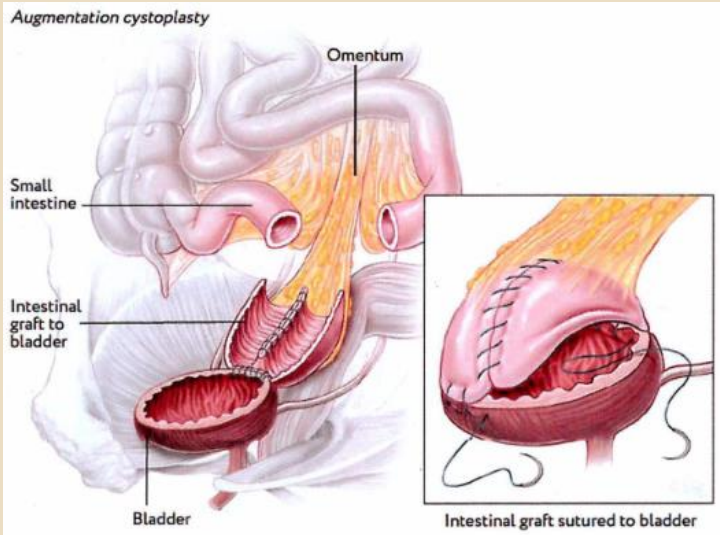
Urge incontinence

- **overactive bladder (OAB)**
  - **urgency**
    - urgent extreme need to void (urination)
  - **urinary frequency**
    - frequent urination
  - **nycturia**
    - night urination 2x and more
  - **urge incontinence**
    - occurs when there is loss of bladder control

- cause is not known
  - primary – overactivity of detrusor muscle
  - secondary – infection, tumour, radiation, trauma

Urge incontinence therapy

- suitable drinking regime and physical activities
- **incontinence pads and pants**
- **bladder training**
- sacral nerves **electrostimulation**
- **surgery**
  - denervation (botulotoxin application)
  - augmentation cystoplasty
    - bladder replacement by intestine or stomach



Urge incontinence therapy

Pharmacotherapy

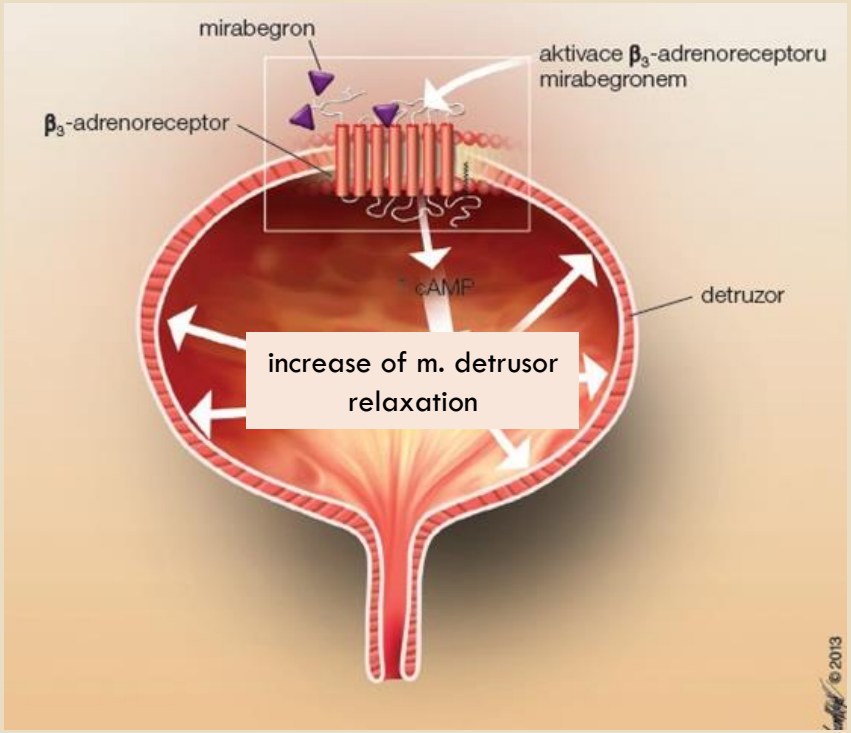
- **anticholinergic drugs**
  - non-selective: propiverine, trospium, oxybutynin
  - M_3-selective: solifenacin, darifenacin, fesoterodine, tolterodine
    - **AEs:** dry mouth, obstipation, tachycardia, urine retention, blurred vision, confusion, sedation, dementia worsening, cognitive impairment, delirium, insomnia, risk of falls

- **direct alpha-1 sympathomimetics**
  - midodrine

Urge incontinence therapy

Pharmacotherapy

- **selective β_3-adrenoceptor agonist**
  - mirabegron
    - advantage is the absence of anticholinergic effects
- **estrogens**
  - women in menopause
  - estriol in different forms
- **antidepressants**
  - tricyclic AD
    - anticholinergic effect
    - imipramin, dosulepin
  - SNRI
    - duloxetine



Overflow incontinence

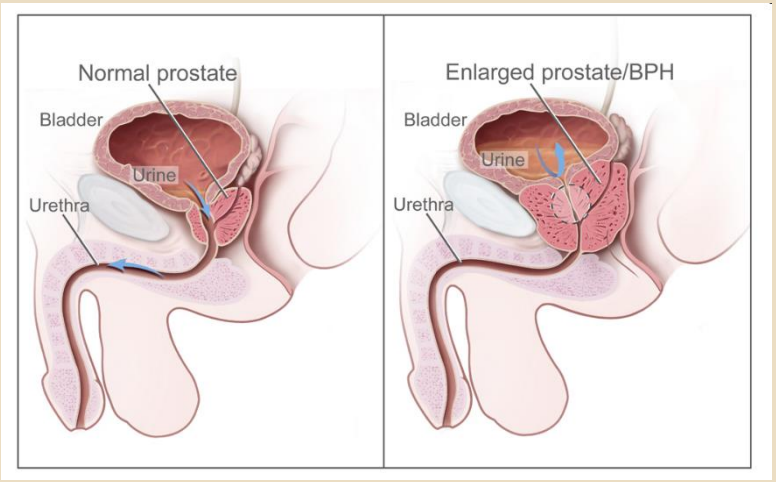
- **inability to completely evacuate the bladder**
  - overflow leaks out unexpectedly – incontinence
  - frequent urinary infections
- **rather in men**
  - **enlarged prostate gland**
  - any urethral blockage
  - neuropathy
    - DM, multiple sclerosis
  - drugs
    - anticonvulsants, antidepressants

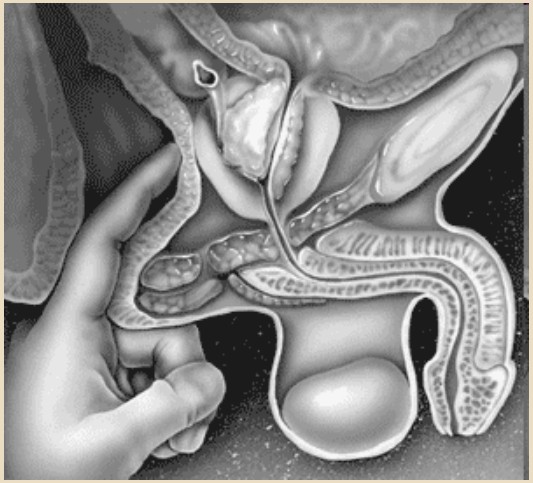
Diagnostic methods

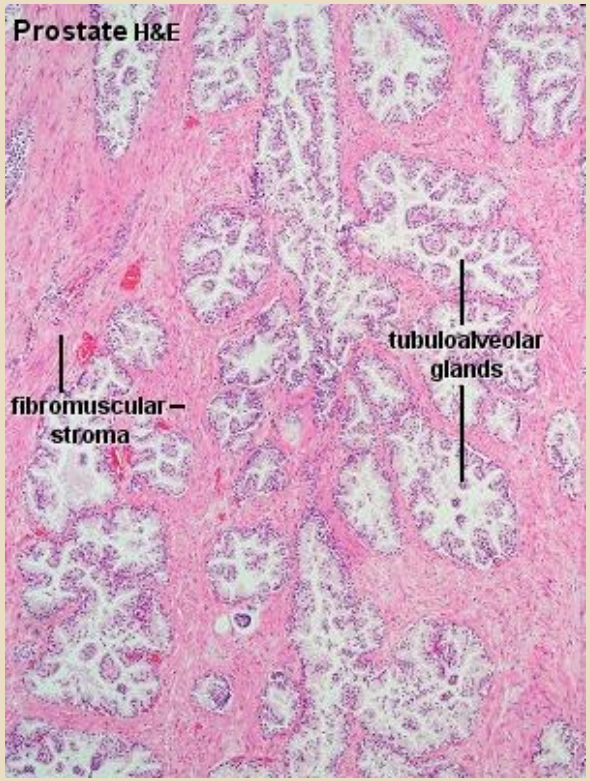
- **anamnesis**
- **clinical examination**
- **questionnaires** I-QoL (Incontinence-quality of life)
- **laboratory examination**
- **endoscopy** of urethra or urinary bladder (cystoscopy)
- **imaging methods**
  - X-rays, US, MRI
- **functional diagnostics (urodynamic testing)**
  - techniques measuring pressure in the bladder and the flow of urine

Benign prostatic hyperplasia (BPH)

- age-related increase in volume of the prostate gland
  - hyperplasia of epithelial and stromal cells
- increase resistance to flow of urine from the bladder





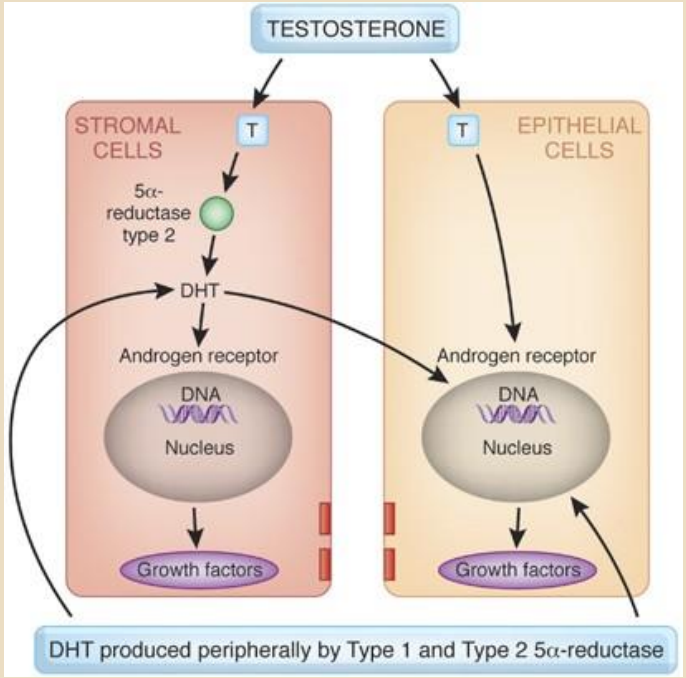


BPH symptoms

- **lower urinary tract symptoms (LUTS)**
  - frequent urination, nycturia
  - urgency
    - compelling need to void that cannot be deferred
  - involuntary urination
  - urge incontinence
- **bladder outlet obstruction (BOO)**
  - acute urinary retention
  - dysuria
  - urinary hesitancy
  - urinary intermittence

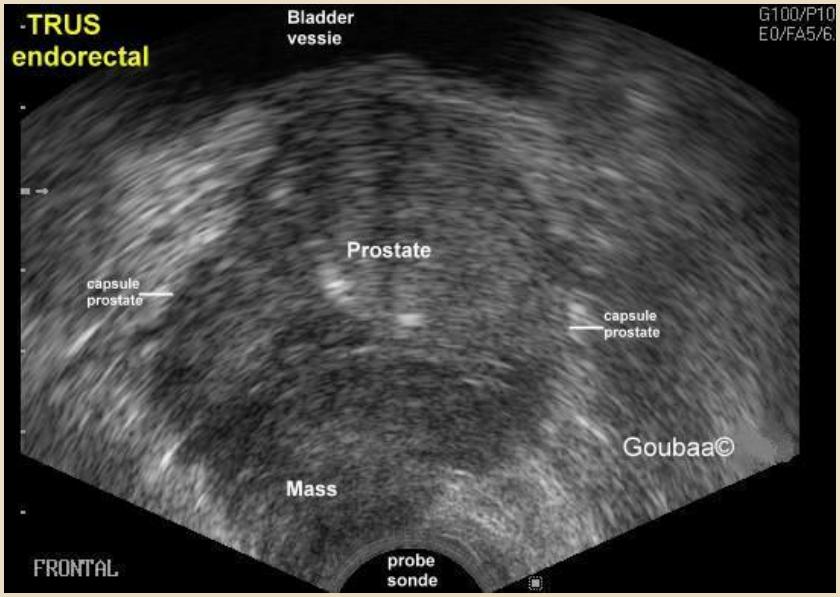
BPH causes

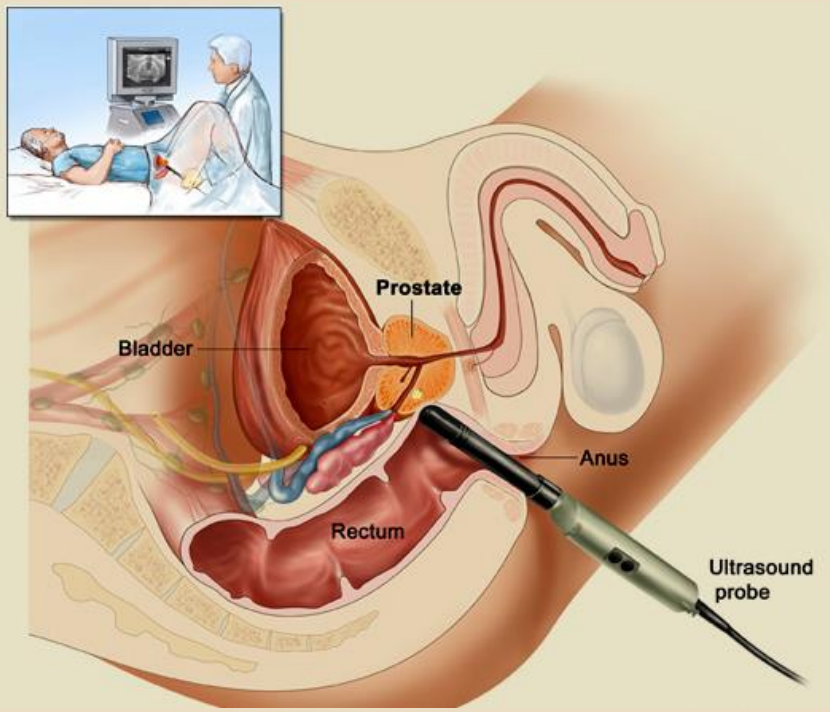
- **androgens**
  - **dihydrotestosterone** synthesized by **5α-reductase** from circulating testosterone
  - strong mitogenic factor for stromal and epithelial cells



BPH diagnosis

- **PSA (prostatic specific antigen)**
- **imaging methods**
  - ultrasound
  - CT, MRI





BPH therapy

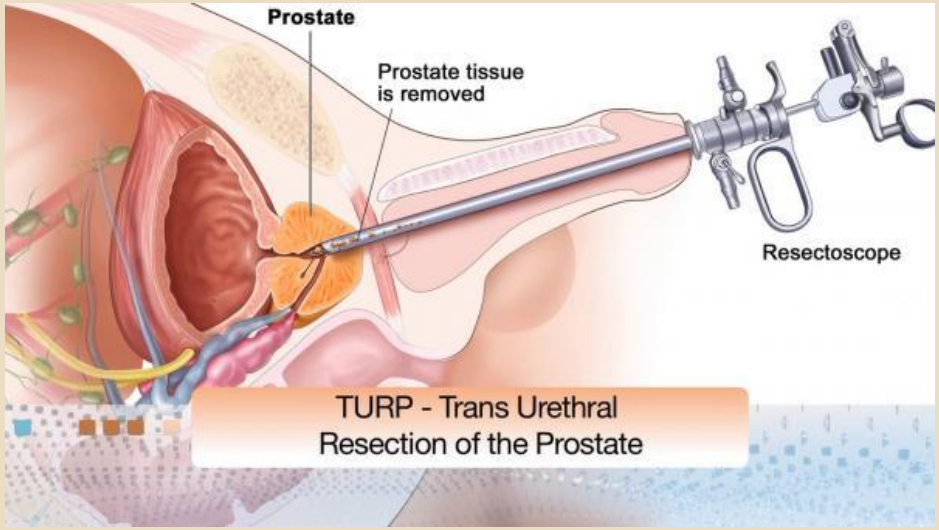
- **lifestyle management**

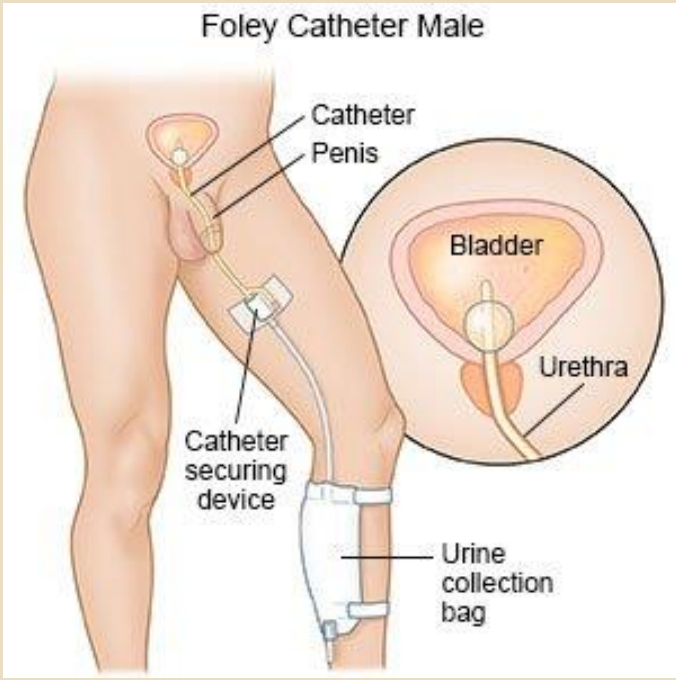
Pharmacotherapy

- **alpha blockers (α_1-adrenergic antagonists)**
  - relaxation of prostatic smooth muscle, thus decreasing the blockage of urine flow
  - doxazosin, terazosin, alfuzosin, tamsulosin, silodosin
    - AEs: vertigo, orthostatic hypotension
      - uroselective tamsulosin and silodosin related to the lowest portion of AEs, therefore suitable for the elderly patients over 70 y.
- **5α-reductase inhibitors**
  - finasteride, dutasteride
- **mepartricin**
  - macrolide ATB
  - chronic pelvic pain syndrome

BPH therapy

- **catheterization** (Folley catheters)
- **surgery**
  - minimally invasive approaches (TUMT, TUNA)
  - invasive approaches (TURP)





PADAM syndrome

- **partial androgen deficiency in aging males (andropause)**
- reduction in the levels of hormones **testosterone and dehydroepiandrosterone**
  - **protein synthesis, bone formation, liver functions, sexual functions**
- **risk factors**
  - poor diet, alcohol consumption, stress, surgery, brain injury

PADAM syndrome

- **hypogonadotropic hypogonadism**
  - low GnRH, LH, then temporary increase
- **andropause**

- loss of libido, erectile dysfunction, impotence
- loss of concentration, depression, insomnia
- diabetes mellitus

- **testosterone replacement therapy**
  - p.o., i.m., transdermal forms
  - risk of liver impairment, strokes and heart attacks, acceleration of prostate cancer
    - frequent examination of liver and prostate (PSA) necessary