



- **What is the definition of urinary incontinence?**
  - Involuntary loss of urine (even losing one drop of urine involuntary is considered to be incontinence!).
- **What is the normal physiology of continence?**
  - **It is a balance between urethral closure and detrusor muscle contraction.**
    - ✓ With continence, urethral pressure is more than bladder pressure thus urine remains in the bladder.
    - ✓ Even if there is increased intra-abdominal pressure (caused by coughing or sneezing) this pressure will be transmitted equally to the bladder and urethra so there is no difference in pressure between the two → still there is continence.
- **What are the receptors of micturition?**
  - **$\alpha$ -receptor:** found in the internal urethral sphincter (in males). When stimulated by the sympathetic nervous system → it will result in urethral sphincter constriction preventing micturition.
  - **$\beta$ -receptor:** found in the detrusor muscle of urinary bladder. When stimulated by the sympathetic nervous system → it will result in relaxation of the bladder wall preventing micturition.
  - **Cholinergic receptors:** found in the detrusor muscle of urinary bladder. When stimulated by the parasympathetic nervous system → they will result in contraction of the bladder wall enhancing micturition. In addition, pudendal nerve will be stimulating leading to relaxation of the external urethral sphincter.
- **What are the types of urinary incontinence?**
  - **Stress incontinence (commonest type):**
    - ✓ Cause: it occurs when there is increased intrabdominal pressure (during coughing or sneezing) in which this pressure will not be distributed equally between the urinary bladder and the urethra. Therefore, pressure in urinary bladder will be higher resulting in micturition (notice that there is no loss of urine at night). This weakening of the pelvic floor is the result of:
      - ❖ Menopause of aging (most common).
      - ❖ Other predisposing factors: obesity, smoking, chronic cough or multiple vaginal deliveries.
    - ✓ The defect is anatomical; not physiological.
    - ✓ Clinical examination (stress-coughing test): patient's urinary bladder must be full → ask her to cough → urine will leak!
    - ✓ Management:
      - ❖ *Life-style:* weight loss, reduce caffeine intake and Kegel exercises (to strengthen muscles of the pelvic floor).
      - ❖ *Surgery:* elevate the urethral sphincter (urethropexy) by attaching the sphincter to pubic symphysis.
  - **Urge/hypertonic incontinence (over-active bladder):**
    - ✓ Cause: involuntary rise in bladder pressure from an idiopathic detrusor muscle contraction which cannot be voluntary suppressed (notice there is nocturia). This condition is mostly affecting women with advanced age and can be seen with:
      - ❖ Bladder cancer.
      - ❖ Urinary Tract Infections (UTIs).
      - ❖ Bladder stones.



- ✓ Investigations:
  - ❖ *Urinalysis and culture:* normal.
  - ❖ *Cystometry:* involuntary detrusor muscle contraction are presented even with small amounts of urine.
- ✓ Management:
  - ❖ Anticholinergic medications (such as: oxybutynin).
  - ❖ NSAIDs: to inhibit detrusor muscle contractions.
- **Irritative incontinence:**
  - ✓ Cause: involuntary rise in bladder pressure due to detrusor muscle contraction caused by the following:
    - ❖ Infections.
    - ❖ Foreign bodies.
    - ❖ Stones.
    - ❖ Tumors.
  - ✓ History of the patient: loss of urine with urgency, frequency and dysuria occurring day and night.
  - ✓ Clinical examination: suprapubic tenderness (in case of cystitis).
  - ✓ Investigations:
    - ❖ *Urinalysis:*
      - Bacteria or WBCs with (+) urine culture (infection).
      - RBCs (stone, foreign body or tumor).
  - ✓ Management:
    - ❖ Antibiotics (if there is an infection).
    - ❖ *Cystoscope:* to diagnose or remove stones, foreign bodies and tumors.
- **Overflow incontinence:**
  - ✓ Cause: gradual rise in bladder pressure due to an over-distended bladder. There is loss of urine in small (intermittent) amounts during the day and night.
  - ✓ This is a neurological problem due to decreased pudendal nerve sensation (S2-S4).
  - ✓ History of patient: complaining of pelvic fullness.
  - ✓ Investigations:
    - ❖ *Urinalysis and culture:* normal.
    - ❖ *Cystometry:* residual volume is very high.
  - ✓ Management:
    - ❖ Self-catheterization.
    - ❖ Discontinue any anticholinergics (if taken).
    - ❖ Give cholinergic medications (bethanechol) to stimulate the bladder contraction.
- **Fistula (vesicovaginal fistula):**
  - ✓ Cause: urine is leaked through a fistula from the urinary tract! There is loss of urine in small (continuous) amounts during day and night.
  - ✓ History of patient: pelvic surgery or obstructed labour.
  - ✓ Management: surgical repair of the fistula.
- Cystometry:
  - **Patient must first empty her bladder as much as possible. Urinary catheter is placed to empty the bladder then used to infuse saline thus assessing:**
    - ✓ Residual volume: < 50 ml.
    - ✓ Sensation of fullness: 200-225 ml (sensation of fluid in the bladder).
    - ✓ Urge to void: 400-500 ml (until the patient feels the need to void).