

Urinary Incontinence

1. Definition: UI is defined as involuntary leakage of urine.
2. It is frequently accompanied by other bothersome LUT symptoms such as urgency, increased daytime frequency, and nocturia.
3. It is a common yet under detected and underreported health problem that can significantly affect quality of life.
4. Epidemology:
5. The impact of this condition is substantial, crossing all racial, ethnic, and geographic boundaries 🡪 lead to poorer quality of life.
6. The condition can affect of all age groups and an increase in elderly, but the peak of incidience of UT in women around the age of menopause and increase after age 65.
7. Some studies report a higher incidence of UI overall in white populations as compared with AA.
8. The UI is half as common in men as in women
9. Etiology and Pathophysiology: 4
10. Urethral Underactivity (UU) or (Stress Urinary Incontinence)

* Increases in intraabdominal pressure during physical activity are transmitted to the bladder, compressing it and forcing urine through the weakened sphincters.
* In women, the peak of SUI is during or after the onset of menopause 🡪 hormonal factors play an important role in continence
* In men, SUI is most commonly the result of prior LUT (lower urinary tract) surgery or injury, with resulting compromise of the sphincter mechanism within and external to urethra 🡪 it is uncommon in men

1. Bladder Overactivity (Urge Urinary Incontinence)

* Symptoms of bladder overactivity occur because the detrusor muscle is overactive and contracts inappropriately during the filling phase 🡪 the terms overactive bladder (a symptom syndrome) and detrusor overactivity (a urodynamic diagnosis) are distinct and should not used interchangeably.
* Overactive bladder is a syndrome w/o association of a known pathologic condition
* Detrusor overactivity is a diagnosis specifically caused by the detrusor muscle
* Mechanisim for overactive bladder and UUI must be either neurogenic or myogenic 🡪 Idiopathic

1. Urethral Overactivty and/ or Bladder Underactivity (Overflow Incontinence)

* It is important but uncommon type of UI in men and women.
* Overflow incontinence results when the bladder is filled to capacity at all times but is unable to empty, causing urine to leak from a distended bladder past a normal or even overactive outlet and sphincter
* In UO: there is a resistance to the flow of urine during volitional voiding is increased resulting in functional or anatomic obstruction and incomplete bladder emptying.
* The most common cause of uthrethral overactivity in men is antomic urethral obstruction including BPH and prostate cancer.
* In women, UO is rare but may result from cystocele formation or surgical overcorrection following anti-SUI surgery.
* BU may result in overflow incontinence.

1. Mixed incontinence and other types of UI

* The combo of BO and UU is called mixed incontinence.
* Functional incontinence is not cause by bladder or urethra specific factors, but is linked to the primary disease process more than any extrinsic or intrinsic deficit of LUT such as dementia and postoperative orthopedic surgery patients.
* Many localized or systemic illnesses may result in UI because of their effects on the LUT or the surrounding structures: dementia/delirium, depression, UTI (cystitis), postmenopausal atrophic urethritis or vaginitis, DM, neurologic disease, pelvic malignancy, constipation and congenital malformations.

1. Medications that influence LUT function: page 1470
2. Clinical presentation
3. Urethral Underactivity:

* Patients note UI during activities
* Occurs more common in women
* Symptoms: urine leakage with physical activity 🡪 no nocturia
* Diagnosis: observation of urethral meatus while patient coughs or strains.

1. Bladder Overactivity:

* Symptoms: urinary frequency, w/wo urgency, nocturia and enuresis
* Diagnosis: urodynamic studies are the gold standard (urinalysis and urine culture should be negative 🡪 rule out UTI as the casue of frequency)

1. Urethral Overactivty and/ or Bladder Underactivity

* Important but rare
* Symptoms: lower abdominal fullness, hesistancy, and sense of incomplete bladder emptying.
* Signs: increased postvoid residual urine volume
* Diagnosis: digital rectal exam or transrectal ultrasound 🡪 rule out prostatic enlargement, and renal function est 🡪 rule out renal failure.

1. Nonpharmacologic treatment: 1st line

* Table 94-3: Lifestyle modifications, scheduling regimens, pelvic floor muscle rehabilitation, anticontinence devices and supportive interventions.
* Behavioral interventions are the 1st line of treatment for SUI, UUI, and mixed UI.
* Regular follow-up is needed to help motivate patients and caregivers, provide reassurance and support, and monitor treatment outcomes.

1. Pharmacologic treatment:
2. Urge urinary incontinence: anticholinergic/antispasmodic drugs are 1st line

* MOA: suppressing premature detrusor contractions, enhancing bladder storage, and relieving UUI symptoms
* Anticholinergic drugs have been demonstrated to improve quality of life, with no significant differences between agents.
* Women with mixed UI or UUI plus urethritis or vaginitis may benefit from a topical estrogen alone or combo with an anticholinergic drugs
* Patients with irritative symptoms of BPH that persist despite specific BPH treatment may benefit from anticholinergic therapy as well because these agents may precipitate acute urinary retention.
* Oxybutynin IR: 1st line and gold standard
  + High incidence of adverse effects especially dry mouth due to the active metabolite N-desethyloxybutynin generated during first pass metabolism.
  + Transient high peak of oxybutynin serum plasma concentration especially in elderly
  + It is best tolerated when dose is gradually increased from no more than 2.5 mg BID to start to 2.5 mg TID after 1 month and increased in increments of 2.5 mg/day every 1 to 2 months.
* Oxybutynin ER:
  + 5-30 mg daily: use the lowest dose initially
  + It takes up to 4 weeks to see benefit or after escalation of dosing
* ER transdermal Oxybutynin:
  + 3.9 mg/day twice weekly.
* Prutitis and erythema at application site
* Oxybutynin gel:
  + Applied once daily (delivers 4 mg/day)
  + Application of sunscreen 0.5 hours before or after application of the gel or showering 1 hr does not affect BA.
  + Prutitis, erythema, dermatitis and site reactions at application site
* Tolterodine IR (competitice muscarinic receptor antagonist): 1st line therapy for UI in patients with symptoms of urinary frequency, urgency or urge incontinence
* Tolterodine ER or LA: a major consideration in using it is its

pharmakinetics especially its metabolism.

* In extensive metabolizers: the parent drug is metabolized by CYP2D6 to active 5-hydroxymethyl metabolite (DD01).
* In poor metabolizers who lack CYP2D6: it is metabolized by CYP3A4
* In the hepatic impairment patients and are taking a CYP3A4/CYP2D6 inhibitors: the initial dose should be reduced by 50% 🡪 Tolterodine IR 1 mg twice daily or tolterodine LA 2 mg once daily
* Fesoterodine fumarate: prodrug
* No dosage adjustment is necessary in patients with mild to moderate renal or hepatic impairment.
* Starting dose is 4 mg daily and increasing to 8 mg daily.
* The dose of Fesoterodine should not exceed 4 mg daily in the presence of severe renal impairment (CrCl < 30 mL/min) or in patients also taking potent CYPA4 inhibitors.
* It is not recommended in patients with severe hepatic impairment.
* Response is dose-related: 8 mg daily has higher responses than 4 mg daily.
* Trospium Chloride: a quaternary ammonium anticholinergic
* Poorly absorbed and significantly reduced BA by food 🡪 should take on an empty stomach
* Renal impairment (CrCl < 30 mL/min) does significantly reduce drug clearance 🡪 dose reduction by 50% of daily dose
* 20mg twice daily
* In patients 75 years and older: dose reduction to 20 mg once daily
* Trospium Chloride ER
* It is not recommended in patients with severe renal impairment (CrCl < 30 ml/min).
* 60 mg daily
* Solifenacin Succinate: is believed to be a “uroselective agent” but it is nonselective
* 5 mg once daily (up to 10 mg once daily).
* Administered with or without food.
* CrCl < 30 ml/min or with moderate hepatic impairment or taking one or more potent CYP4A4 inhibitors: the daily dosage should not exceed 5 mg.
* It should not be used in patients with severe hepatic impairment
* Darifenacin: “uroselective agent” but it is nonselective
* BA is affected by formulation, CYP2D6, dose and race.
* 7.5-15 mg once daily of ER formulation
* Botulium toxin A
* Catheterization combined with medications

1. Urethral Underactivity or SUI
   * Estrogen:
     + Only topical products due to many SE’s
     + Work best if urethritis or vaginitis due to estrogen deficiency is present
   * Alpha adrenergic receptor agonists:
     + Contraindications: hypertension, tachycardia, CAD, MI, cor pulmonable, hyperthyroidism, renal failure and narrow-angle glaucoma.
     + AE’s: hypertension, headache, dry mouth, nausea, insomnia and restlessness.
   * Duloxetine: 1st line therapy, but not FDA approved: 40-80 mg/day (one or two doses)
2. Surgical treatment