

STATION 1: UROGYNECOLOGY

Urinary incontinence

BACKGROUND

Definition

Involuntary leakage of urine

Incidence

- 25 % of young women
- 44–57 % of middle-aged/postmenopausal
- 75 % of older women

However, approximately half of these women do not complain of urinary incontinence. Therefore, you need to screen for symptoms during any gynecologic visit.

Causes

- **Functional (filling/storage):** urodynamic SI, overactive bladder (idiopathic, neuropathic)
- **Fistula:** vesical, ureteral, urethral
- **Infectious:** UTI, vaginitis
- **Congenital:** ectopic ureter, epispadias
- **Non-genitourinary:** functional (neuro, psycho, cognitive), pharmacologic, metabolic, environmental

Examples of medications that affect bladder function: Anticholinergics, alpha-adrenergic agonists, alpha-antagonists, diuretics, calcium channel blockers, sedative-hypnotics, ACE inhibitors, and antiparkinsonian medications, hydroxychloroquine, antipsychotics

BACKGROUND

Types

Major types

- **Stress incontinence:** involuntary leakage of urine that occurs with increases in intra-abdominal pressure (e.g., sneezing, coughing) in the absence of a bladder contraction.
- **Urgency incontinence:** Women experience the urge to void immediately preceding or accompanied by involuntary leakage of urine.
- **Mixed:** Women with symptoms of both stress and urgency incontinence

Other types

- **Chronic retention**
- **Continuous**
- **Coital:** following intercourse
- **Extra-genital:** fistulas, congenital anomalies
- **Functional:** e.g. cognitive disorders
- **Occult:** in the presence of prolapse
- **Overactive bladder** (urgency, frequency, nocturia) with no UTI or other pathology
- **Nocturnal enuresis**
- **Postural**
- **Postmicturition:** postvoiding dribbling

EVALUATION

History

4 points; history, physical exam, assessment of severity, assessment of treatment goals

- **Patient demographics:** name, age, menopausal status
- **Present Illness:**
 - **Incontinence:** Type of incontinence, freq, no of pads/day and pads/night
 - **Prolapse symptoms:** bulge/pressure, onset and course
 - **Stress incontinence:** with (cough/lifting/sneezing/exercise/laugh/sex), onset, frequency
 - **Overactive bladder:** urgency, urge incontinence (onset, frequency), frequency, nighttime frequency (noturia), NE (loss of urine during sleep)
 - IF YES for OAB: triggers: sight/sound of water, key in the door, position change.
 - **Bowel symptoms:** frequency/day, constipation, strain, stool trapping?, perineal/vaginal splinting, fecal incontinence (freq)
 - **Voiding symptoms:** incomplete emptying, positional voiding, valsalva voiding
 - **Brief UTI history**
 - **Sexual history:**
 - Active (no issues, dyspareunia, dryness)
 - Inactive (reason): distress? Others?
 - **Cups and glasses per day:**
 - Water/Coffee/Soda/Juice/Tea/alcohol/Milk
- **Medical History :** HTN, CAD, DM, Thyroid, COPD, coag, autoimmune (steroids, MTX), chronic pain (opioids)
- **Medications:** narcotic analgesics, anticholinergic drugs, antihistamines, psychotropic drugs, alpha-adrenergic blockers, alpha-adrenergic agonists, and calcium channel blockers
- **Surgical History :** hysterectomy (route, year, age), BS/BSO, POP surg, UI surg, appy, chole
- **Social history :** tobacco, etOH, occupation
- **Family history :** breast, ovarian, endometrial, colon
- **Urinary diary:** Bladder diaries help to document symptoms, help initiating behavioral Changes. Record for 3–5 days.

EVALUATION

Impact on quality of life: Clinicians should identify those symptoms that are most bothersome to the patient as this can help guide treatment

Examination

Inspection

- **Inspection of the urethra:**
 1. urethral diverticulum*
 2. Cough stress test - CST
 3. urethral mobility
- **Inspection of the perineum:** extraurethral leakage "fistula, ectopic ureter", vulvar/vaginal atrophy
- **Inspection of the vagina:** prolapse (cystocele, rectocele, vault/uterine), vaginal discharge

Pelvic examination

- **Palpation:**
 - Pain of pelvic musculature
 - Strength of pelvic muscles (0-5)
 - Voluntary muscle relaxation
- **Bimanual exam:** uterine size and mobility, adnexal masses
- **Rectal examination:** to evaluate
 1. anorectal pathology: fistula, tumor, hemorrhoids, or fissure
 2. Fecal impaction → voiding difficulties and incontinence in elderly. Treating fecal impaction often improves incontinence.
 3. Anal sphincter tone and strength: and prior sphincter tears.

Neurological examination

- Mental status
 - sensory and motor function of the perineum and both lower extremities (S2-4)
- NB:** The anal wink and bulbocavernosus reflexes may be clinically absent in women without neurologic disease.

Cough stress test

It can be performed in the supine position during pelvic examination.

- If the test is negative, it should be repeated in standing position and with a full bladder (at least 300 mL) "so you may ask the pt to come to clinic with full bladder".
- If it is still negative despite patient symptoms, you may retrograde fill the bladder until patient reports fullness or bladder volume is at least 300 mL.
- If it remains negative multichannel urodynamic testing.

Interpretation:

Visualization of fluid loss from the urethra with a cough is a positive test. Urine loss that occurs in a delayed manner after cough is a negative test (cough-induced overactive bladder).

Urethral mobility:

- **What is that:** resting angle or displacement angle of urethra–bladder neck with maximum Valsalva, at least 30 degrees from the horizontal level.
- **How to test:** Q-tip test "cotton swab", assessment of point Aa in POP, inspection and palpation, ultrasound
- **Significance:**
 - Surgery is more successful with urethral mobility before surgery.
 - Lack of urethral mobility → 1.9-fold increase in the failure rate of midurethral sling
 - lack of urethral mobility = better candidates for urethral bulking agents (rather than sling or retropubic procedures).

EVALUATION

By the end of evaluation, if stress incontinence is the diagnosis, you should determine if it is complicated or uncomplicated (which needs further evaluation)

Uncomplicated**History**

- UI is associated with involuntary loss of urine on effort , physical exertion ,sneezing , coughing
- Absence of recurrent UTI
- No prior extensive pelvic surgery
- No prior surgery for SI
- Absence of voiding symptoms
- Absence of medical condition that affect UT function

Examination:

- No vaginal bulge beyond the hymen
- Absence of urethral abnormality

Urethral mobility

Present

Post voids residual urine volume:

< 150 ml

Urine analysis & urine culture:

- Negative result for infection or haematuria

Complicated**History:**

- symptoms of urgency ,Incomplete emptying ,Incontinence associated with chronic urinary retention Functional impairment or continuous leakage
- recurrent UTI
- previous extensive or radical pelvic surgery (radical hysterectomy)
- prior anti-incontinence surgery or complex urethral surgery
- voiding symptoms
- Presence od neurological disease, poorly controlled DM, dementia.

Examination:

Presence of vaginal bulge, prolapse beyond the hymen, genitourinary fistula, urethral diverticulum

Urethral mobility: absence

Post void residual volume: > 150 ml

- Complete list of patient medications should be obtained to determine whether individual drugs may be influencing function of the bladder and urethra which lead to UI or voiding difficulties
- Recurrent UTI: documented 3 UTI in 12 months or 2 documented UTI in 6 months

EVALUATION

Usually office assessment is sufficient

Work-up

Urinalysis

- UTI should be diagnosed and treated before investigations.
- Clean midstream OR catheterized urine sample → dipstick urinalysis → if suspicious for infection (nitrites, leukocytes) → urine culture + empiric antibiotic therapy
- If microscopic hematuria is present (3 or more per HPF in microscopic examination of urinary sediment "not dipstick") → cystoscopy and computed tomography.

Urodynamic studies

When:

- **Based on patient demographics:**
 1. Elderly patient (>65 y) with multiple possible diagnoses
 2. Nulliparous woman with stress incontinence
- **Based on HPI/type of incontinence:**
 1. Unclear diagnosis "e.g. negative CST with a full bladder, symptoms do not match the exam"
 2. Significant urge component or irritative voiding symptoms
 3. History of urinary retention
 4. Continuous incontinence or leakage with minimal activity
 5. Nocturnal enuresis if other diagnostics are exhausted
- **Based on PMH:**
 1. Advanced diabetes (bladder neuropathy or cystopathy)
 2. Known or suspected neurologic disease as a cause or contributor
- **Based on PSH:** Previous failed incontinence surgery
- **Based on physical examination:**
 1. Abnormal CNS exam: including lower extremity, or pelvic floor
 2. High postvoid residual volume
 3. Stress incontinence with minimally increased intra-abdominal pressure, an empty bladder, or positive supine stress test

EVALUATION

Work-up
(cont)

Urodynamic studies

How:

- **Cystometry:** bladder (and abdominal) pressure during filling, storage, and voiding to assess :
 1. Bladder sensation.
 2. Capacity.
 3. Compliance.
 4. Presence and magnitude of voluntary and involuntary detrusor contractions.
- **Uroflowmetry** (voided volume/min) and pressure-flow studies: Measure
 1. Rate of urine flow.
 2. mechanism of bladder emptying (detrusor contractions and urethral relaxation):
 - i. Normal: 15 mL/sec
 - ii. Abnormal: either bladder outlet obstruction or decreased detrusor contractility (cannot differentiate)
- **Urethral pressure profiles/Valsalva leak point pressures (urethral function):**
 1. Urethral pressure = max urethral pressure – vesical pressure
 2. Functional Urethral Length = length of urethra that has pressure > vesical pressure (1-4 cm)
 3. Lower urethral pressure: poorer continence outcomes/predict surgical failure (cut offs not defined).
 4. Valsalva leak point pressures: they do not reliably predict surgical outcomes.

It is unclear how these can impact clinical decision.
- **Electromyography:** study neuromuscular activity of pelvic muscles and urethral sphincter during voiding.
Value: assessment of coordination between detrusor muscle contraction and simultaneous urethral sphincter relaxation.

Cysto-urethroscopy

When:

- Microscopic hematuria
- Acute-onset
- Refractory urgency incontinence
- Recurrent urinary tract infections
- Suspicion for fistula or FB after gyn surgery

EVALUATION**Work-up
(cont)****Final
diagnosis by
the end of
assessment**

- **Pelvic organs prolapse**
 1. Cystocele
 2. Rectocele
 3. Periocele
- **Urinary incontinence**
 1. SUI
 2. UUI
 3. Mixed
- **Pelvic muscle**
 1. Decreased tone
 2. Levator spasm
- **Bowel**
 1. Constipation
 2. Loose
 3. Defecatory dysfunction
- **Infection & atrophy**
 1. UTI
 2. Recurrent UTI
 3. Atrophy

MANAGEMENT

Pessaries

- **Type of incontinence:** stress and mixed incontinence
- **Effectiveness:** they may improve symptoms. Objective evidence on effectiveness has not been reported. Studies report patient satisfaction as an outcome:
 - ❖ After 3 months, patient satisfaction is higher with behavioral–physical therapy (75%) than with the pessary group (63%).
 - ❖ By 1 year, patient satisfaction rates decreased in both to 50%.
- **Indication:** patients with stress incontinence:
 - ❖ Who wish to avoid surgery.
 - ❖ Who are not likely to adhere to behavioral–physical therapy.
 - ❖ Who wants more immediate relief than behavioral–physical therapy
- **Action:** Control stress incontinence symptoms by supporting the urethra and increasing urethral resistance

Behavioural therapy

(Bladder training, weight loss, and fluid management)

- **Type of incontinence:** equally effective in all types (stress, urgency, or mixed)
- **Effectiveness:** It proves to be effective (50% reduction in mean incontinence episodes).
- **Indication:** it may be recommended as an initial, noninvasive treatment for many women.

- **Bladder training:** e.g. timed voiding and bladder drills
 - It aims to increase the time interval between voiding
 - Typically used for urgency incontinence, yet still effective with stress urinary incontinence and mixed urinary incontinence
- **Weight loss:**
 - Obesity is a risk factor for urinary incontinence (4.2-fold greater risk of SUI).
 - Type of incontinence: mostly SUI
 - Effectiveness: Moderate weight loss can improve symptoms in overweight and obese women; 47% and 28% reduction in SUI episodes overweight and obese women after 6 months.
- **Dietary Fluid Management:**
 - Advise to decrease fluid intake several hours before bedtime if they have nighttime or early-morning incontinence.
 - Advise to reduce fluid intake (no more than 2L/day) + frequent bladder emptying.
 - Advise to reduce caffeine intake (even 1 cup of coffee/day is associated with incontinence).

MANAGEMENT

Physical
therapy

Kegel exercises strengthen the voluntary periurethral and perivaginal muscles (voluntary urethral sphincter and levator ani). It is used alone or with bladder training, biofeedback, or electrical stimulation.

- **Type of incontinence:** it can be effective as a first-line for the 3 types of incontinence. Efficiency decreases over time. It is most effective when initiated under a physician supervision.
- **Effectiveness:** 50% of women with SUI are satisfied after 1 year of treatment (85% for surgery). 49% of women started on pelvic floor muscle training crosses over to sling surgery versus 11% who does the opposite.

Therefore, pelvic floor muscle training can be offered as a first-line treatment for stress urinary incontinence and midurethral sling surgery can be offered as an alternative primary treatment after counseling.

MANAGEMENT

Drug therapy

Type of incontinence: only for urgency incontinence (not recommended for SUI)

Antimuscarinic medications

- **Drug:** darifenacin, fesoterodine, oxybutynin, solifenacin, tolterodine, and trospium (all are similar in efficacy and safety)
- **Indication:** Second line for UUI after behavioral therapy, physical therapy, or both.
- **Mechanism:** bladder M2 and M3 receptor blocker → inhibit involuntary detrusor contractions.
- **Effectiveness:** it results in higher continence rates. However, the magnitude of effect is modest.
- Combination of behavioral and antimuscarinic therapy has not been found to be more effective than antimuscarinic therapy alone.
- **Side effects:** dry mouth = most common (significant discontinuation rates)
- **Dose:** Oxybutynin (Ditropan): 5-mg (may use 2.5 in elderly) 2-3/day. Max 5 mg X4/day. Tolterodin: 2 mg X2/day, extended release is 4mg/day

Beta-agonists

- **Drug:** Mirabegron (Myrbetriq)
- **Dose:** 25-50 mg PO qDay
- **Mechanism:** beta-3 adrenergic receptor agonist in the detrusor muscle → muscle relaxation and increased bladder capacity.
- **Effectiveness:** Significant symptom reduction on short term studies. Safe drug; side effects comparable to placebo.
- **Contraindications:** not recommended with:
 1. Severe uncontrolled hypertension
 2. End-stage renal disease
 3. Significant liver impairment.

Onabotulinumtoxin A (Botox A)

- **Indication:** overactive bladder (after counseling).
- **Mechanism:** Botulinum toxin (*Clostridium botulinum* neurotoxin) → inhibiting presynaptic release of acetylcholine from motor neurons at neuromuscular junction → muscle paralysis.
- **Route:** cystoscopic injection of multiple aliquots into detrusor muscle (100U).
- **Effectiveness:** similar reduction in incontinence episodes to antimuscarinics at 6 months but higher rate of complete resolution (27% versus 13%).
- **Side effects:**
 1. Higher risk of UTI (33%)
 2. High risk of voiding dysfunction "retention, incomplete emptying" requiring catheterization (5%).

Estrogen

- **Systemic** estrogen therapy: not effective in prevention or treatment of urinary incontinence (higher incidence of incontinence with hormonal use).
- **Locally** administered (vaginal) estrogen: may show some benefit in decreasing incontinence

MANAGEMENT

Neuro-
modulation

- **Indication:** refractory urgency incontinence (failed conservative and pharmacologic)
- **Procedure:** stimulation of nerves that innervate the bladder and pelvic floor. The procedure is done in 2 stages: (1) trial phase: electrode placement to determine if symptoms are improved sufficiently. (2) implantation of a pulse generator.
- **Mechanism:** unknown, it may modulate reflex pathways of bladder storage and emptying.
- **Effectiveness:** 62% clinical success rate for treating refractory UUI:
 1. 26% of patients: complete dryness
 2. 36% > 50% reduction of incontinence episodes

Injection of
bulking
agents

- **Agent:** pyrolytic carbon-coated beads and calcium hydroxylapatite
- **Indication:** SUI with intrinsic sphincter deficiency:
 1. If surgery has failed
 2. If symptoms recur after surgery
 3. Symptomatic women with no urethral mobility
 4. Older women who are not candidates for anesthesia/surgery.
- **Procedure:** The agents are injected transurethrally or periurethrally into the periurethral tissue around the bladder neck and proximal urethra to increase urethral resistance.
- **Effectiveness:** less effective than surgical procedures; rarely used as primary treatment. Improvement rate is 63% to 80% at 1 year.
- **Adverse outcomes:** recurrent incontinence and need for repeat injections.

MANAGEMENT

Surgery

Indications

1. Second line for SUI if symptoms are not adequately controlled with conservative treatment.
2. First-line treatment for women declining conservative treatment after adequate counseling.
3. Surgical treatments are associated with higher success rates than conservative therapy. However, it is associated with increased morbidity, including postoperative voiding difficulty and urgency incontinence.

Surgeries

I. Synthetic midurethral mesh slings

- ❖ **Indication:** standard of care in SUI
- ❖ **Effectiveness:** comparable to suburethral fascial slings, open colposuspension, and laparoscopic colposuspension. However:
 1. Fewer adverse events than with suburethral fascial slings.
 2. Less voiding dysfunction than with open colposuspension.
- ❖ **Alternatives:** this surgery is the primary choice. However, if patient declines or is not candidates for synthetic mesh slings →
 - (1) Autologous fascial bladder neck slings and (2) Burch colposuspension (laparoscopic or open).
- ❖ **Safety:** unlike vaginal mesh in treatment of prolapse, this option has no issues in terms of safety compared to the former.
- ❖ **Approach:** main approaches are (1) retropubic and (2) transobturator. They are comparable in efficacy and patient satisfaction.
 - **Effectiveness:** Subjective cure rates up to 1 year are 62-98% (transobturator) and 71-97% (retropubic). Long term outcomes > 5 years are also comparable.
 - **Complications:**
 1. Retropubic: Voiding dysfunction, bladder perforation, major vascular or visceral injury, operative blood loss are more common.

MANAGEMENT
Surgery
Surgeries
II. Autologous fascial bladder neck slings
Indications are:

1. Severe SUI, non-mobile, fixed urethra: autologous bladder neck sling can be placed under more tension than a synthetic sling (urethral erosion with synthetic material).
2. Concomitant urethral reconstruction procedures (eg, diverticulectomy or fistula repair): good outcomes and low complication rates.
3. Complications from mesh previously placed in the anterior vagina (for urinary incontinence or pelvic organ prolapse).

Incontinence and prolapse
Pelvic organ prolapse with SUI

- They coexist in 80% of cases.
- Two procedures are done concomitantly. The type of continence procedure often is selected based on the route of access for the prolapse repair.

Pelvic organ prolapse without SUI

- 40% of women without SUI develop symptoms of stress incontinence after surgical correction of pelvic organ prolapse (occult SUI).
- All women with significant apical prolapse, anterior prolapse, or both should have a preoperative evaluation for occult stress incontinence (CST or urodynamic testing with the prolapse reduced → if positive: consider an incontinence procedure at the time of pelvic organ prolapse repair after appropriate counseling.
- Burch colposuspension at the time of abdominal sacrocolpopexy and retropubic midurethral sling at the time of vaginal surgery for pelvic organ prolapse repair decrease the risk of postoperative SUI in women without preoperative SUI (24% versus 49%). So, patient should be counseled of this benefit against the risk of added morbidity from concomitant surgery.

MANAGEMENT

Surgery

Voiding trial after surgery:

- Asking the patient to void/may fill the bladder retrograde.
- Usually > 50% emptying is sufficient
- If not: self intermittent catheterization "SIC" on dismissal vs indwelling Foley

	SIC	Foley
Advantages	Bladder cycling Less risk of UTI	No education needed
Disadvantages	Education needed May be more inconvenient	No bladder cycling Higher risk of UTI

Self-intermittent catheterization:

- Ask the patient to void when she feels urge or every 4 hours
- She should immediately self cath after voiding
- She should report voided volume and postvoid volume and reports it to you e.g. Day 4, day 7
- This should be improving over time. Otherwise, surgery may be indicated.