



## 437 Team: Obstetrics and Gynecology

# Pelvic Floor Disorders

### Objectives:

- Describe pelvic anatomy and pelvic support
- List risk factors for pelvic floor disorders
- Describe signs and symptoms of pelvic floor disorders
- Discuss the steps in the evaluation of pelvic floor disorders
- Describe the anatomic changes associated with pelvic floor disorders
- Describe non-surgical and surgical management for pelvic floor disorders
- Differentiate the types of urinary incontinence

### References:

- Kaplan USMLE step 2 CK - Obstetrics and Gynecology
- Online Meded videos
- Team 435

### Team members:

Reham AlHalabi, Maha Barakah & Dana AlRasheed

Team leader: Rahaf AlShammari

Revised by: Sondos AlHawamdeh

# Introduction

- The lifetime risk for undergoing a surgery for prolapse or urinary incontinence is 11%.
- The most common indication for hysterectomy for women age 55 and greater is pelvic prolapse.

## Pelvic Anatomy and Pelvic Support

### Anatomy:

- The pelvic floor is made up of muscles, and fascia (**perineal membrane**)
- The muscles are named the pelvic diaphragm, consisting of **levator ani muscles** (puborectalis, pubococcygeus, iliococcygeus) and coccygeus muscles
- The peritoneal membranes (part of the urogenital diaphragm) is present in the urogenital triangle. the vagina and urethra pass through it.

### Support:

- The uterus is supported by the **cardinal ligaments, uterosacral ligaments, and endopelvic fascia.**
- Arcus tendineus fascia pelvis: gives lateral support to the vagina which supports the cervix.

What is pelvic organ prolapse?

- Pelvic organ prolapse (POP or female genital prolapse) is the protrusion of bladder, rectum, intestines, uterus, cervix, or vaginal apex into the vaginal vault due to decreased pelvic floor support.

## Risk Factors for Pelvic Floor Disorders

Pelvic organ prolapse is related to pelvic relaxation, usually related to:

- Most commonly is **vaginal childbirth** (clinically 3 or more consider risk factor)
- Advanced age
- Obesity.
- Genetic predisposition.
- Menopause
- Pelvic surgery
- Connective tissue diseases
- Increased intra-abdominal pressure

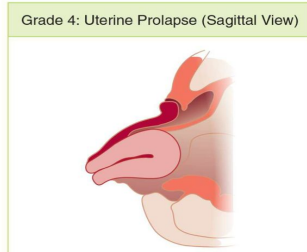
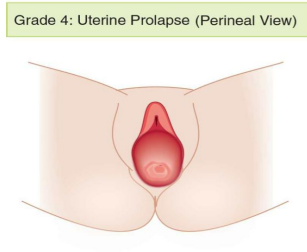
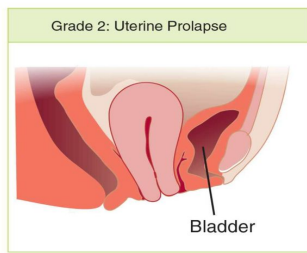
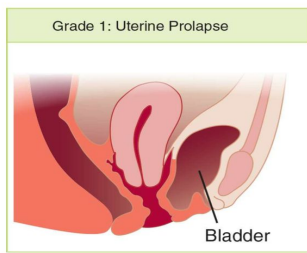
### Pelvic organ prolapse include:

- Uterine prolapse
- Vaginal prolapse, which includes
  - Cystocele
  - Rectocele
  - Enterocele

## Signs and Symptoms of Pelvic Floor Disorders

- Majority are asymptomatic (no intervention).
- Vaginal pressure or heaviness
- Abdominal lower back pain (back pain not consider main presentation because is common in male and female)
- Vaginal or perineal pain or discomfort
- **Mass sensation/bulging** (most common presentation).
- Urinary or fecal loss or retention
- Sexual health issues

# Uterine Prolapse



Half of parous women who had a vaginal delivery will show a prolapse when clinically examined, but might not have any symptoms or functional abnormalities

Physical findings may not correlate with specific pelvic symptoms.

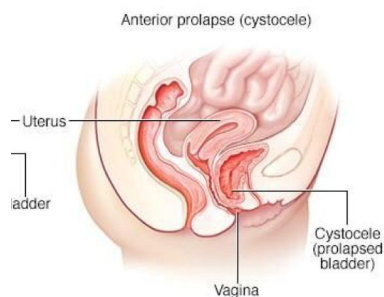
## Grades :

The severity of prolapse is indicated by increase in grade from 1

Kaplan	APGO Video
	<b>Stage 0 :</b> No prolapse, the cervix or vaginal cuff is at the top of the vagina
<b>Grade 1:</b> cervix descends halfway to the hymen	<b>Stage I :</b> The leading part of the prolapse is more than 1 cm above the hymen
<b>Grade 2:</b> cervix descends to the hymen	<b>Stage II :</b> The leading part of the prolapse is less than or equal to 1 cm above or below the hymen
<b>Grade 3:</b> cervix extends halfway past the hymen	<b>Stage III :</b> The leading edge is more than 1 cm beyond the hymen, but less than or equal to the total vaginal length
<b>Grade 4 (procidentia):</b> entire uterus, as well as the anterior and posterior vaginal walls, extends outside the introitus	<b>Stage IV (Procidentia) :</b> Complete eversion

# Vaginal Prolapse 3 types

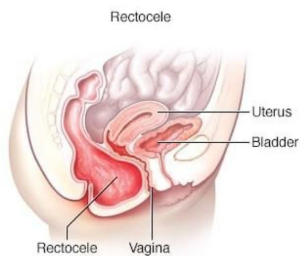
## Cystocele



Herniation or bulging of the **anterior vaginal wall** and overlying **bladder** base into the vaginal lumen

- Postmenopausal woman
- Anterior vaginal wall protrusion
- Urinary incontinence

## Rectocele

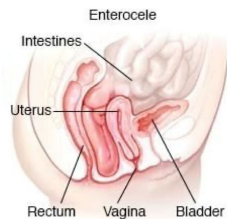


Herniation or bulging of the **posterior vaginal wall** and underlying **rectum** into the vaginal lumen

- Postmenopausal woman
- Posterior vaginal wall protrusion
- Digitally assisted removal of stool

## Enterocoele

Peritoneum of cul de sac (small bowel)



Herniation of the **pouch of Douglas** containing **small bowel** into the vaginal lumen.

## Examination and diagnosis:

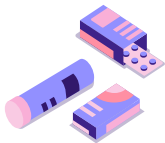
- ➔ Mainly made through observation at the time of pelvic examination. The prolapsed vagina, rectum, and uterus are easily visualized, particularly as the patient increases intra-abdominal pressure by straining.
- ➔ Speculum

## Management:

Since this is mainly a lifestyle problem, usually it is treated depending on the effect on the lifestyle.

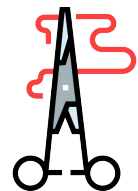
### 1) Non-surgical treatment for a minor degree of relaxation.

- Kegel exercises (voluntary contractions of the pubococcygeus muscle)
- Estrogen replacement in postmenopausal women. (local or combined with progesterone)
- Pessaries (objects inserted into the vagina that elevate the pelvic structures into their more normal anatomic relationships) most gynecologists use them as first-line therapy.
  - Ring pessary: supportive and used for mild prolapse
  - Gellhorn or Cube **pessaries**: space occupying and used in high degree prolapses or Procidentia



### 2) Surgical treatment when more conservative management has failed.

- Hysterectomy and vaginal repair (**Colporrhaphy**)
    - vaginal hysterectomy > uterine prolapse
    - anterior vaginal repair (**Colporrhaphy**) > the cystocele
    - posterior vaginal repair(**Colporrhaphy**) > the rectocele.
- The anterior and posterior colporrhaphy uses the endopelvic fascia that supports the bladder and the rectum, and application of this fascia restores normal anatomy to the bladder & rectum.
  - Limit strenuous activity for 3 months postoperatively to avoid recurrence of the relaxation.
    - Abdominal sacral colpopexy: suspending the vagina to the sacrum
    - Colpocleisis: closure of the vagina. It's used in older women who won't tolerate invasive surgery and are no longer sexually active.



# Urinary incontinence

Urinary incontinence is the inability to hold urine, producing involuntary urinary leakage.

## EVALUATION OF INCONTINENCE

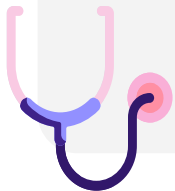
### History:

- A 3-day (full, 24-hour days) voiding diary (a record of the bladder's behavior that helps to identify the diagnosis)
- List the amount of fluid taken in and the amount of urine produced, record how much urge is felt and whether there is pain at, before, or after voiding.
- Urine loss with physical activity suggests stress.
- Urge to empty but not getting to the toilet fast enough suggests urge. Incontinence with both physical activity and sense of urgency suggests mixed.
- Continuous loss of urine day and night suggests fistula.



### Physical Exam:

- An abdominal exam should rule out masses, ascites, and organomegaly, which can influence intra-abdominal pressure.
- pudendal nerve innervation of the perineum with the bulbocavernosus and clitoral sacral reflex (lightly brushing the labia majora or tapping the clitoris should produce a reflex of the external anal sphincter muscle).
- pelvic exam to evaluate for inflammation, infection, and atrophy, which can increase bladder sensitivity and lead to urgency, frequency, and dysuria.
- Vaginal wall prolapse findings will identify cystocele, rectocele, and enterocele.
- Q-tip test to assess for hypermobility of the urethrovesical junction.
  - ◆ With patient in supine position, place a sterile, well-lubricated cotton-tipped swab in the urethra (angle the swab  $<30$  degrees from the horizontal; with inadequate bladder neck support, angle will be  $>30$  degrees)



### Urinalysis & culture:

A urinalysis should be performed in all patients, looking for leukocytes (WBC), bacteria, and RBC.

- Many WBC and bacteria would suggest a UTI; do urine culture for identification of bacteria and antibiotic sensitivities. Treat with appropriate antibiotics.
- Microscopic hematuria would suggest a bladder stone or foreign body and tumor. Do further work-up with cystoscopy.



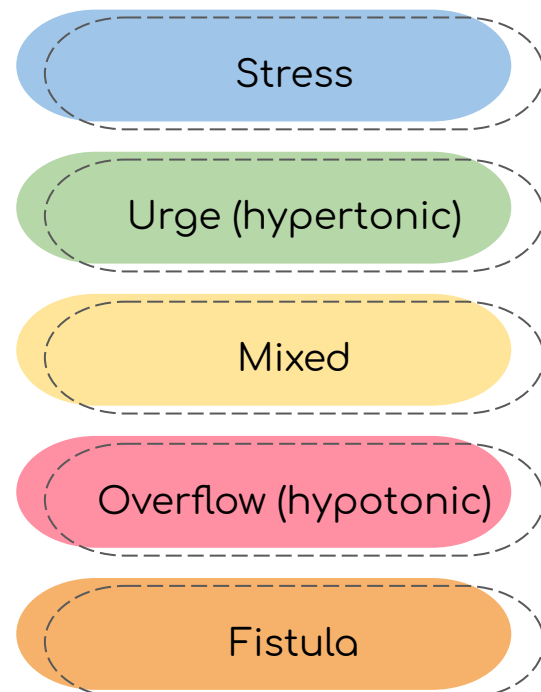
## Cystometric studies:

- Basic office cystometry begins with the patient emptying the bladder as much as possible. A urinary catheter is first used to empty the bladder and then left in place to infuse saline by gravity retrograde assessing the following:
- ◆ **Residual volume:** how much is left in bladder after voiding (normal <100 mL)
  - ◆ **Sensation-of-fullness volume:** how much infusion (in mL) until patient senses fluid in bladder (normal 200–225 mL)
  - ◆ **Urge-to-void volume:** how much infusion (in mL) until patient feels the need to empty bladder (normal 400–500 mL)
  - ◆ **Involuntary bladder contractions:** detect involuntary detrusor contractions by watching saline level in syringe rise or fall (absence of contractions is normal)

Post-void residual	<100 mL
Sensation of fullness	200–225 mL
Urge to void	400–500 mL

Table II-2-1. Cystometric Volume Measurements

## Classification Of Incontinence



# Classification Of Incontinence

## 1) Genuine stress incontinence (most common incontinence in young women)

- the result of rises in bladder pressure due to intra-abdominal pressure increases (e.g., coughing and sneezing). Which are not transmitted to the urethra.
- may be associated with **urethral hypermobility** (loss of integrity of pelvic floor muscles) or less commonly with intrinsic sphincteric deficiency (weakness of urethral sphincter itself).

### Diagnosis:

#### > History:

- o Loss of urine simultaneous with activities which increase abdominal pressure such as coughing, jumping, laughing or sneezing
- o No urine loss when sleeping
- o 25% of women will have stress incontinence for the first 4-6 months after vaginal delivery

#### > Examination:

- o Normal neurologic test
- o Positive Q Tip test

#### > Investigation:

- o Normal urinalysis, culture and cystometric studies.

### Management:

#### > Kegel exercise

#### > Estrogen replacement therapy in menopausal women

#### > Surgical therapy:

- o Tension tension-free vaginal tape procedure (minimally invasive):  
(a mesh tape is placed transcutaneously around and under the mid urethra. It does not elevate the urethra but forms a resistant platform against intra-abdominal pressure.)
- o Urethropexy:  
(Surgical therapy aims to elevate the urethral sphincter so that it is again an intraabdominal location. This is done by attachment of the sphincter to the symphysis pubis, using the Burch procedure as well as the Marshall-Marchetti-Krantz (MMK) procedure. The success rate of both of these procedures is 85-90%.)

#### > Bulking agents: used in sphincter deficiency when surgery fails or is contradicted (second-line therapy)

## 2) Hypertonic incontinence (motor urge)

- most common incontinence in older women
- the result of involuntary rises in bladder pressure, occurring from idiopathic detrusor contractions that cannot be voluntarily suppressed.

### Diagnosis:

#### > History:

- o Loss of urine in large amounts often without warning.
- o Takes place both day and night.
- o The most common symptom is urgency.

#### > Examination:

- o Pelvic examination shows normal anatomy.
- o Neurologic examination is normal.

#### > Investigation:

- o Urinalysis and culture are normal. Cystometric studies show normal residual volume, but involuntary detrusor contractions are present even with small volumes of urine in the bladder.

### Management:

- Behavioral Therapy, Anticholinergic medications (e.g., oxybutynin and tolterodine); NSAIDs to inhibit detrusor contractions; tricyclic antidepressants; calcium-channel blockers.



### 3) Mixed incontinence

- mostly older women
- a combination of both stress and urge incontinence. The contribution of each type of involuntary urine loss varies by individual.

#### Diagnosis:

- **History:**
  - Loss of urine may occur with both physical activity, coughing and sneezing as well as after experiencing an overwhelming urge to urinate.
- **Examination:**
  - Pelvic exam may or may not show vaginal prolapse (cystocele, rectocele, or enterocele). Q-tip test is variable. Pudendal nerve innervation will be normal.
- **Investigation:**
  - Urinalysis will be unremarkable.
  - Cystometry will show a normal residual volume, but sensation-of-fullness and urge-to-void volume may be decreased. Involuntary detrusor contractions may be seen.

#### Management:

- No single therapy works for everyone; options will be directed by whether the stress or the urge component is greater.

### 4) Overflow (hypotonic) incontinence

- A rise in bladder pressure occurs gradually from an overdistended, hypotonic bladder. When the bladder pressure exceeds the urethral pressure, involuntary urine loss occurs but only until the bladder pressure equals urethral pressure. The bladder never empties. Then the process begins all over.
- This may be caused by denervated bladder (e.g., diabetic neuropathy, multiple sclerosis) or systemic medications (e.g., ganglionic blockers, anticholinergics).

#### Diagnosis:

- **History:**
  - Loss of urine occurs intermittently in small amounts. This can take place both day and night. The patient may complain of pelvic fullness.
- **Examination:**
  - Pelvic examination may show normal anatomy; however, the neurologic examination will show decreased pudendal nerve sensation.
- **Investigation:**
  - Urinalysis and culture are usually normal, but may show an infection. Cystometric studies show markedly increased residual volume, but involuntary detrusor contractions do not occur.

#### Management:

- Possible intermittent self-catheterization, discontinuation of the offending systemic medications, cholinergic medications to stimulate bladder contractions, and  $\alpha$ -adrenergic blocker to relax the bladder neck.



## 5) Fistula

- the normal urethral-bladder mechanism is intact but is bypassed by urine leaking out through a fistula from the urinary tract.

### Diagnosis:

- **History:**
  - The patient usually has a history of radical pelvic surgery or pelvic radiation therapy. Loss of urine occurs continually in small amounts. This can take place both day and night.
- **Examination:**
  - Pelvic examination may show normal anatomy and normal neurologic findings.
- **Investigation:**
  - Urinalysis and culture are normal. An intravenous pyelogram (IVP) will demonstrate dye leakage from a urinary tract fistula. With a urinary tract- vaginal fistula, intravenous indigo carmine dye will leak onto a vaginal tampon.

### Management:

- Surgical repair of the fistula.



### Hypertonic, motor, urge, overactive bladder

**Path:** Random spasms of detrusor muscles

**Pt:** Urge +

Nocturia +

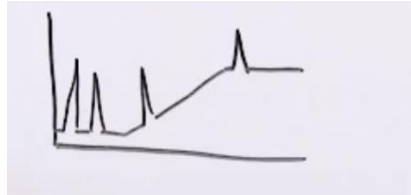
Leak + Incontinence

**Dx:** Cystometry is decreased

Physical Exam > Normal

Urinalysis > Normal

**Tx:** Anti spasmodics (Oxybutarine)



### Hypotonic, overflow, neurogenic bladder

**Path:** -absence of detrusor muscles contractions (neural cause)

-Patients can't feel that they are full to initiate contractions or bladder can't contract.

-Neurogenic bladder (MS, Trauma, Antispasmodic meds) > leaks & explodes.

(Wall tension of bladder will exceed the pressure of sphincter and little urine leaks, once the pressure relieved below that tension > leak stops)

**little urine leaks when tension > sphincter pressure**

**Pt:** Urge -

Incontinual signs and symptoms +

Leaks regularly throughout the day

**Dx:** Cystometry is decreased

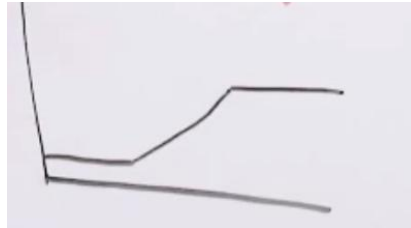
Physical Exam > distended bladder

Focal neurological deficit (paraplegia)

Urinalysis > Normal

**Tx:** Induce spasms (Bethanechol)

Intermittent vs chronic indwelling catheter.



### Irritative Bladder

**Path:** inflammation (Stones, Cancer, UTI)

**Pt:** frequency, Urgency, dysuria

+Urge

-Nocturia

**Dx:** Physical Exam > Normal

Urinalysis > WBCs, RBCs (cancer, stones)

**Tx:** Based on underlying condition

UTI: Antibiotics

(Amoxicillin, Nitrofurantoin, TMP-SMX)

Stones: Imaging > strain & capture the stone,

define what type is it and modify risk factors

Cancer: Imaging > Surgery.

### Fistula ( continuous leakage)

Epithelialized tract between 2 organs (bladder and anything)

**Path:** Inflammation, Radiation

History of surgery, cancer, IBD (especially Crohn's)

**Pt:** constant continuous leakage

Normal function (bladder still fills, feel the urge and relax the

sphincter, expel urine through the bladder and into the urethra the

normal way, but in addition constant leak of urine to: skin, vagina, rectum

**Dx:** Physical Exam > see fistula

Tampon test ( you put the tampon where you think the exit is and inject blue dye into the urethra > bladder and wait to see where blue dye goes, it to tampon > +ve fistula

**Tx:** Surgical fistulotomy.

# Teaching case (video case)

A 75-year-old woman G5P5 woman presents for an annual exam and reports a “fullness” in the vaginal area. The symptom is more noticeable when she is standing for a long time. This feeling is bothersome to her and is affecting her daily activities. She does not complain of urinary or fecal incontinence. She has no other urinary or gastrointestinal symptoms. There has been no vaginal bleeding. Her past medical history is significant for well-controlled hypertension and chronic bronchitis. She has never had surgery. Pelvic exam reveals normal appearing external genitalia except for generalized atrophic changes. The vagina and cervix are without lesions. Relaxation of the anterior and posterior vaginal wall are noted to approximately one centimeter beyond the hymen when she is asked to Valsalva. The cervix also descends to the level of the hymen with Valsalva. Uterus is normal size. Ovaries are not palpable. No rectal masses are noted. Rectal sphincter tone is slightly decreased. The patient wishes to discuss options for treatment.



## 1- What are the most important support mechanisms for the pelvic organs?

- Levator ani muscles pelvic diaphragm; semi contracted 4 muscle which will angulate pelvic organs: puborectalis, pubococcygeus, iliococcygeus, coccygeus
- Uterosacral ligaments for the uterus and vaginal apex the only 2 ligaments that provide uterine support are: **cardinal ligament** (transverse) and **uterosacral ligament** (goes backward), whereas, the round ligament is responsible for uterine orientation (retro or anteverted)
- The vesicovaginal and rectovaginal connective tissues for the anterior and posterior vaginal wall (**fascia**)

## 2-What increases this patient's risk for pelvic organ prolapse?

- A. One vaginal delivery or more **strongest risk**
- B. Genetic predisposition
- C. Menopause
- D. Advance age
- E. Pelvic surgery
- F. Connective tissue diseases; **marfan and ehler danlos syndrome**
- G. Increased intra-abdominal pressure ; **straining due to constipation, obesity, lifting**
- H. **Use of forceps during operative vaginal delivery that's why physicians prefer ventose over forceps**
- I. **Smoking weakens connective tissues**

## 3-What are the symptoms of pelvic organ prolapse? **Can be asymptomatic**

1. Vaginal pressure or heaviness
2. Abdominal lower back pain
3. Vaginal or perineal pain or discomfort
4. Mass sensation/bulging
5. Urinary or fecal loss or retention
6. Sexual health issues

#### 4-What are the different types of pelvic organ prolapse?

Name of prolapse	Pelvic structure	Kaplan notes
Cystocele	Anterior wall of the vagina	Herniation or bulging of the anterior vaginal wall and overlying bladder base into the vaginal lumen. <b>Triad:</b> <ol style="list-style-type: none"> <li>1. Postmenopausal woman</li> <li>2. Anterior vaginal wall protrusion</li> <li>3. Urinary incontinence</li> </ol>
Rectocele	Posterior wall of the vagina	Herniation or bulging of the posterior vaginal wall and underlying rectum into the vaginal lumen. <b>Triad:</b> <ol style="list-style-type: none"> <li>1. Postmenopausal woman</li> <li>2. Posterior vaginal wall protrusion</li> <li>3. Digitally assisted removal of stool</li> </ol>
Enterocoele	Peritoneum of cul de sac	Herniation of the pouch of Douglas containing small bowel into the vaginal lumen
Uterine Prolapse		
Vaginal Vault Prolapse (ceiling of vagina)		
Perineal Descent		

#### 5. What are the steps in evaluating someone with prolapse?

- The most important thing to evaluate is the patient's complaint. Prolapse is not dangerous on woman unless it is impacting her ability to empty her bladder (causing urinary retention).
- The Pelvic Organ Prolapse Quantitative (POPQ) is an objective evaluation tool that gynecologists and pelvic floor specialists (Urogynecologists) use to measure prolapse.
- Grading systems (such as the Baden Walker system) may also be used to document prolapse.
- If indicated, evaluation for urinary retention (such as performance of a post void residual) should be completed.
- Some providers will also evaluate levator muscle strength by asking a woman to perform a Kegel squeeze on examination.

## 6. What are treatment options that you should discuss with this patient?

### Non-surgical:

1. Kegel exercises (Kaplan)
2. Estrogen for post-menopausal women, **pt has symptoms of atrophic vaginitis which bother her, and if we are planning to do surgery since we want the tissue be in a better thickness** (Kaplan)
3. Pessaries: most gynecologists use them as first-line therapy, it has many types, such as:
  - a. Ring pessary: supportive and used for mild prolapse
  - b. Gellhorn or Cube pessaries: space occupying and used in high degree prolapses or Procidentia

### Surgical:

1. Hysterectomy: apical support is provided by either:
  - a. Uterosacral ligament suspension
  - b. Sacrospinous ligament suspension
2. Abdominal sacral colpopexy: suspending the vagina to the sacrum
3. Colpocleisis: closure of the vagina. It's used in older women who won't tolerate invasive surgery and are no longer sexually active. (Kaplan: The anterior and posterior colporrhaphy uses the endopelvic fascia to restore the bladder and the rectum to their normal anatomy)

## 7. When is surgery indicated for prolapse?

- Patients desire to for surgical correction
- Recurrent vaginal ulceration or other complications for pessary use

## 8. What are the different types of urinary incontinence?

- **Stress urinary incontinence:** loss of urine associated with coughing, sneezing, laughing, or physical activity
- **Urge incontinence:** loss of urine associated with or immediately preceded by urgency.
- **Mixed urinary incontinence:** a combination of stress and urge incontinence
- **Continuous incontinence:** continual urine passage (commonly caused by vesicovaginal fistula)
- **Overflow incontinence:** Loss of urine intermittently in small amounts and pelvic fullness.
- **Functional incontinence:** Physical or psychological inability to go to and urinate

## 9. What are the steps in evaluating someone with urinary incontinence?

- Questions (history) to clarify what type of incontinence they are experiencing, along with a physical examination and a urinalysis
- Many providers may do a cough stress test, **Valsalva maneuver** or a post void residual to further evaluate bladder function during physical examination. Urodynamic testing may be performed if the provider feels that this is warranted. Some providers will have patients fill voiding diaries to evaluate symptoms

## 10. What are nonsurgical treatment options for urinary incontinence?

- **Behavioral modification** is important to discuss with patients with incontinence symptoms. Decreasing bladder irritants and timed voids can be important and low risk treatments for many women.
- Pelvic floor physical therapy (**Kegel exercises**) can be important and effective in managing urinary incontinence symptoms.
- Medical therapy primarily focused on treatment of detrusor over-activity (**anticholinergics**)
- Incontinence **pessaries** can be an effective treatment of stress incontinence

### History Taking:

Pelvic floor disorders are classified into several groups of disorders.

If a patient present with any of the complaints, you have to ask about of the others.

1. Pelvic Organ Prolapse: vaginal pressure, fullness, buldge (visible or on touch).
2. Lower Urinary Tract symptoms: frequency, urgency, nocturia, urinary incontinence, urinary retention.
3. Bowel Emptying Disorders: : urgency, incontinence, incomplete. emptying.
4. Sexual Disorders: dyspareunia, loss of gratifaction, inorganismia.
5. Chronic Pelvic Pain: back, pelvic or vaginal pain.

