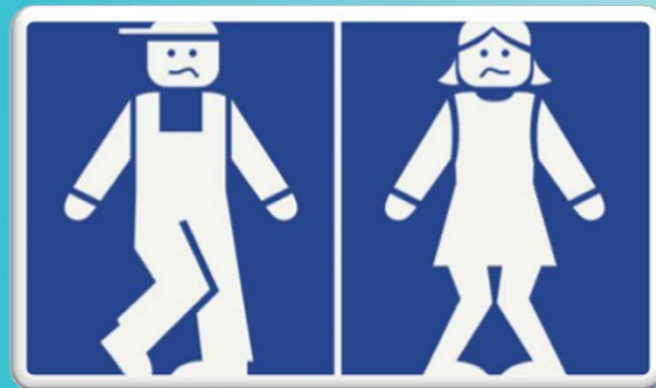


# Canadian Undergraduate Urology Curriculum (CanUUC): INCONTINENCE



# Objectives

1. Describe the normal neurological regulation of bladder and sphincter control.
2. Define stress, urge, mixed, overflow and total incontinence.
3. Outline the basic management plan (including history and physical examination) of an incontinent patient.
4. Describe the medical and surgical treatment options for stress incontinence.
5. Describe the medical treatment options for urge incontinence
6. List the reversible causes of urinary incontinence

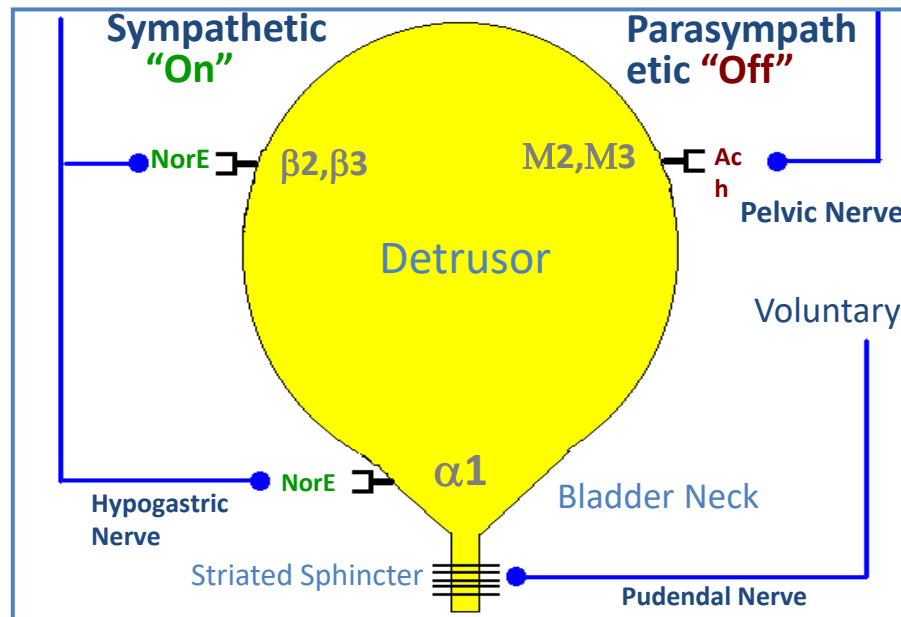
## What is Needed for Normal Bladder Function?

1. Filling - Efficient and low pressure
2. Storage - Low pressure, with perfect continence
3. Emptying - Periodic complete urine expulsion, at low pressure, when convenient

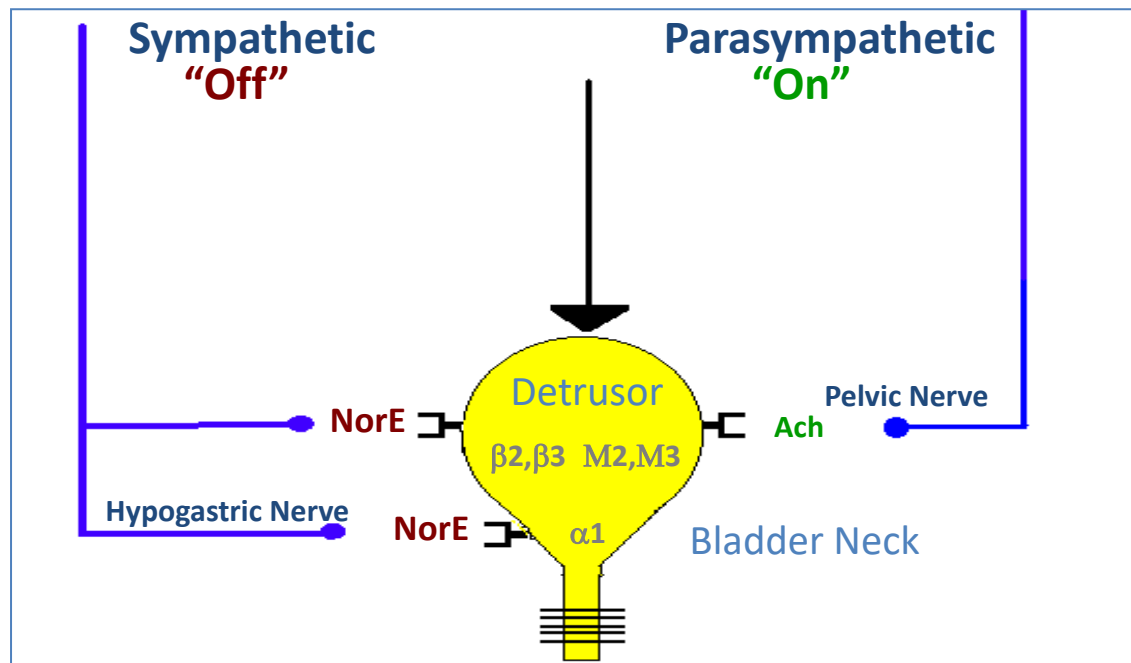
# The Bladder: Innervation

- **Bladder innervation**
  - Sympathetic (Hypogastric nerve)
  - Parasympathetic (Pelvic Nerve)
  - Somatic (Pudendal Nerve)
- **Common disorders classification:**
  - Stress Urinary Incontinence
  - Urge Incontinence/Overactive Bladder (OAB)
  - Neurogenic Bladder

# Normal Bladder Function: Bladder Filling



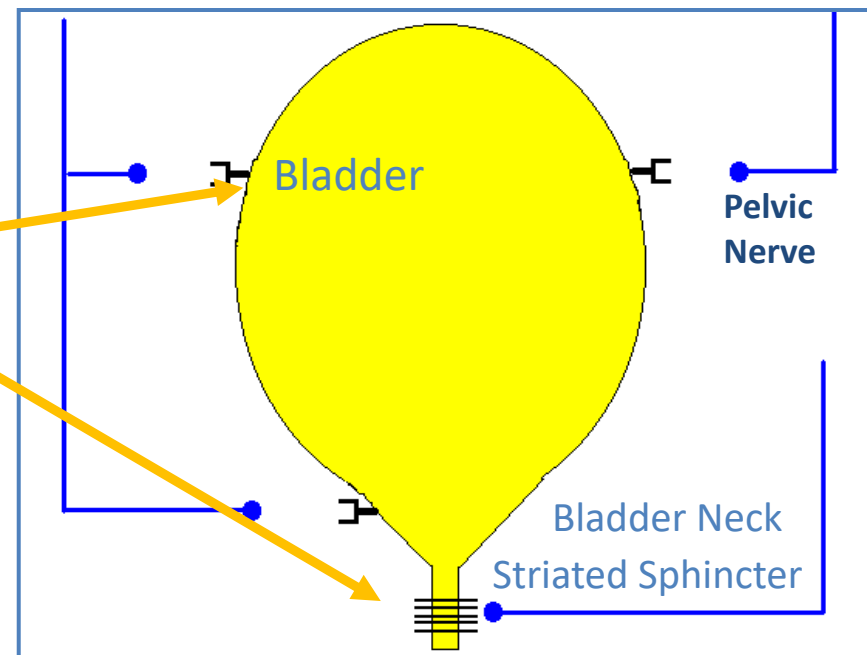
# Normal Bladder Function: Bladder Emptying



# Voiding Dysfunction: Functional Classification

## Classification:

- Failure to Store
  - » Bladder
  - » Outlet
- Failure to Empty
  - » Bladder
  - » Outlet



## Urinary Incontinence: Definition

*"the complaint of any involuntary loss of urine".*



## Incontinence: Types

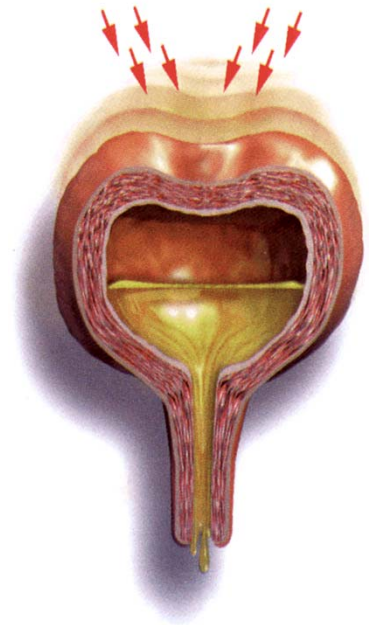
- Stress incontinence: Loss of urine with exertion or sneezing or coughing.
- Urge incontinence: Leakage accompanied by or immediately preceded by urinary urgency.
- Mixed incontinence: Loss of urine associated with urgency and also with exertion, effort, sneezing, or coughing.

## Incontinence: Types (continued)

- Overflow incontinence: Leakage of urine associated with urinary retention.
- Total incontinence: Is the complaint of a continuous leakage.
- Functional incontinence: Relates to a physical, intellectual or environmental issues that can be a contributing cause of incontinence in a person with normal bladder function.

## Other Incontinence Terms: Definitions

- Frequency: voiding too often
- Urgency: sudden compelling desire to pass urine which is difficult to defer
- Nocturia: waking one or more times per night to void



# Incontinence History: Try to Classify the Incontinence

## Stress Incontinence

- *Involuntary loss of urine with coughing or sneezing, or physical exertion*
- "Do you leak when you cough, sneeze, laugh, lift, walk, run, jump?"

## Urgency Incontinence

- *Involuntary loss of urine associated with or immediately preceded by urgency*
- "Do you get that feeling like you "really" have to pee before you leak?"

**Mixed Incontinence - both**

## Incontinence History: Other Key Points

- Use and number of incontinence pads
- Lower urinary tract symptoms (LUTS)
- Presence of neurologic disease
- History of pelvic surgery or radiotherapy
- Obstetrical history
- Bowel and sexual function
- Medication history
- **\*\*Impact on quality of life\*\***

# Physical Examination

- **General examination**
  - Edema, Neurologic Abnormalities, Mobility, Cognition, Dexterity
- **Abdominal examination**
  - Assess for palpable or distended bladder
- **Pelvic exam - women, ?prolapse**
- **DRE - men**
- **Cough test - observe urine loss**

## Incontinence: Investigations

- **Urinalysis**
- **Urine Culture**
- **Voiding Diary**
  - Type of incontinence
  - Number of episodes
  - Volume of leakage

**Incontinence in the Elderly:**  
**Try to identify and treat underlying reversible causes (DIAPPERS)**

**D – delirium (impaired cognition)**

**I – infection (UTI)**

**A – atrophic vaginitis/urethritis**

**P – psychological**

**P – pharmacologic (diuretics, narcotics, etc.)**

**E – endocrine (DM)/excessive urinary output**

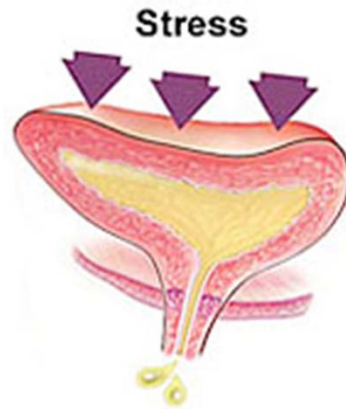
**R – restricted mobility**

**S – stool impaction**



## Stress Urinary Incontinence

*“Loss of urine with exertion or sneezing or coughing”*



# Stress Incontinence: Primary Care (Initial) Management

## Risk Reduction:

- Weight loss
- Smoking cessation
- Topical Estrogen

## Behavioral techniques:

- Kegel exercises
  - » Designed to strengthen pelvic floor muscles
  - » Initial treatment for stress incontinence
  - » Also helpful for urge incontinence

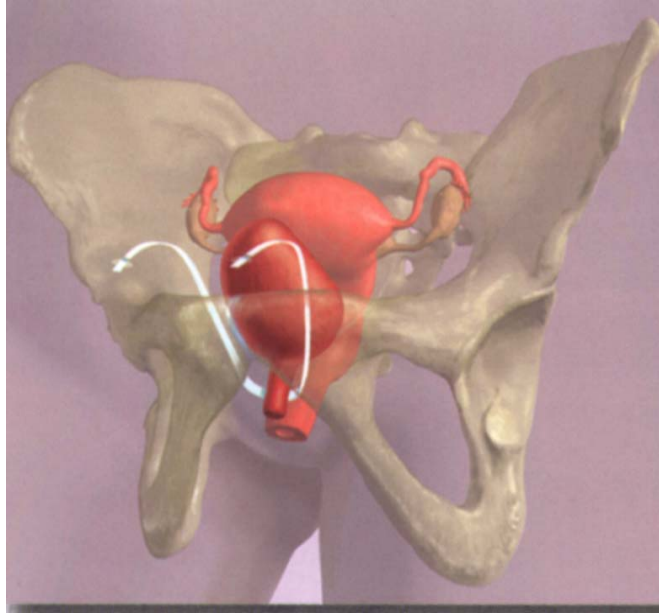
## Stress Incontinence: When to Refer?

- If incontinence causes decrease in quality of life
- Failed previous SUI treatment
- Failed Kegel exercises

## Stress Incontinence: Other Treatment Options

- **Pelvic Floor Biofeedback**
- **Pessary**
  - Intra-vaginal insert to reduce prolapse and support the urethra
- **Urethral Bulking Agents: (collagen, etc.)**
  - Minimally invasive
  - Less durable than surgery
- **Surgery**
  - Urethral sling – Effective and durable

## Stress Incontinence Surgery: Retropubic Sling

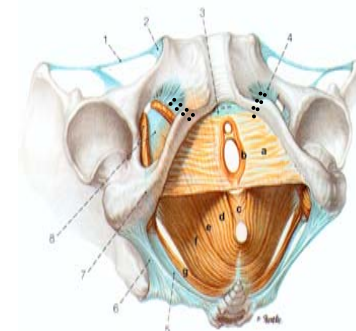


## Stress Incontinence: Surgery Synthetic Mid-Urethral Sling

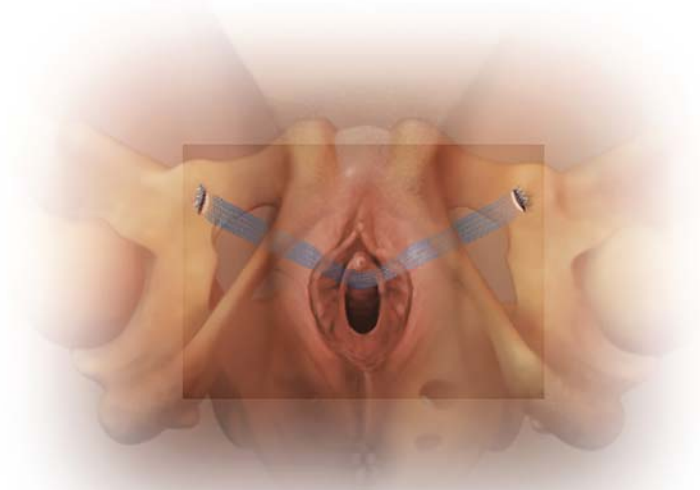
- Day surgery
- 20-30 minutes
- Risks:
  - Bleeding
  - Infection
  - Too tight/retention
  - Mesh complications (chronic pain, erosion/extrusion...)
- Off work 2-4 weeks
  - No restrictions after 4 weeks

## Stress Incontinence Surgery: Mid-Urethral Slings

- Limited vaginal dissection
- Polypropylene mesh under midurethra without tension
- No fixation of the tape
- Operation can be done under local anaesthetic, sedation, GA, or SA



# Stress Incontinence Surgery: Transobturator Sling



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## Stress Incontinence Surgery: Does it Work?

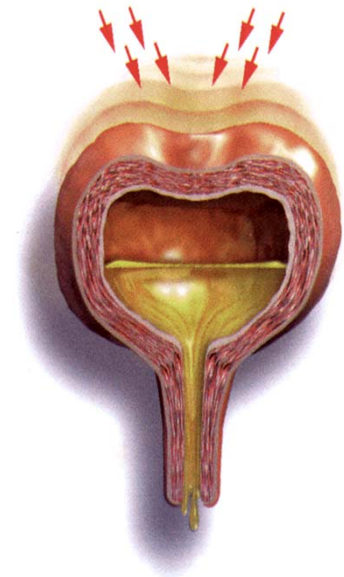
- **Success: 80-85%**
- **Not all bladder/women the same**
- **Treats stress incontinence, not OAB**
- **30% of women will have improvements in OAB symptoms**
- **Retention: 2-3%**

# Urge Urinary Incontinence (UUI) /Overactive Bladder (OAB)

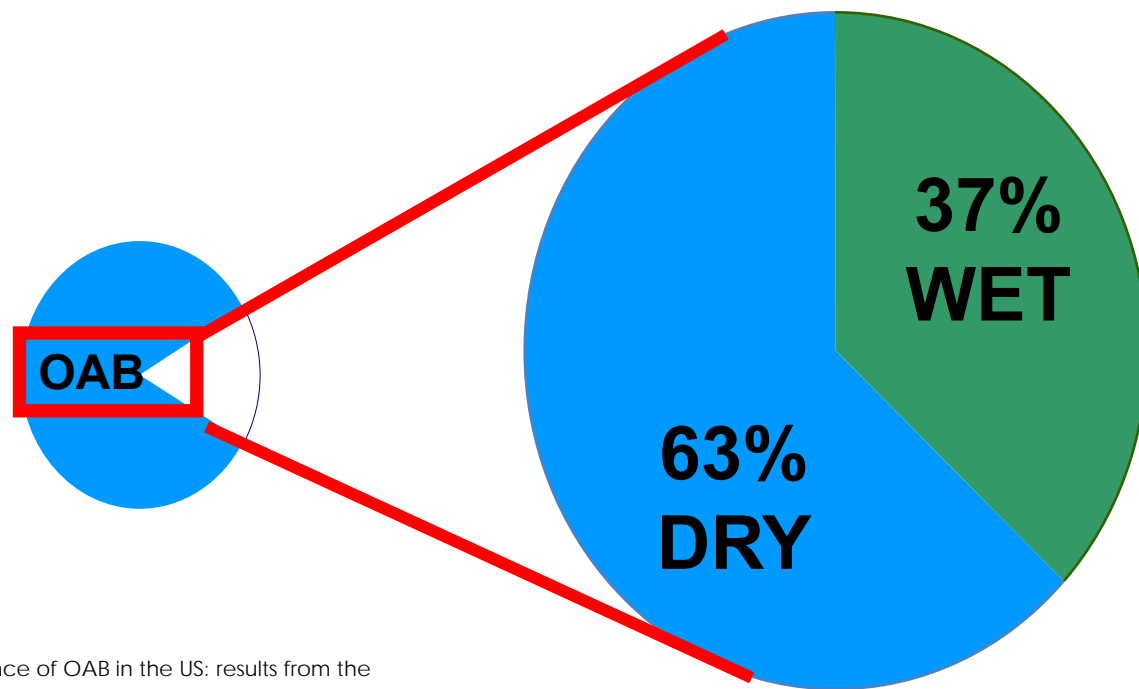
- **Urge Incontinence:**
  - Involuntary leakage of urine accompanied by or immediately preceded by urinary urgency
- **OAB:**
  - A symptom complex of urgency, with or without urge incontinence, usually with frequency and nocturia

## Overactive Bladder: Definitions

- Frequency: voiding too often
- Urgency: sudden compelling desire to pass urine which is difficult to defer
- Urge incontinence: involuntary loss of urine associated with or immediately preceded by urgency
- Nocturia: waking one or more times per night to void



## Overactive Bladder: Prevalence: Incontinent versus Continent



Stewart W et al. Prevalence of OAB in the US: results from the NOBLE program. Poster presented at WHO/ICI; July, 2001; Paris, France.

## Overactive Bladder: Etiology

- **Inappropriate contraction (or sensation) of detrusor muscle during bladder filling**
- **Idiopathic**
  - No identifiable cause
  - ?related to aging (unclear mechanism)
- **Neurogenic**
  - Stroke, Parkinson's disease, MS, Alzheimer's disease, brain tumor

## Overactive Bladder: Important Questions on History

- How often do you void during the day?
  - Give examples: q1hr, q2-3hr, etc.
- When you gotta go, do you gotta go?
- How many times do you get out of bed to void?
- Do you leak urine?
- Do you have to wear pads? Change clothes?
- Do you have a strong or slow stream?
- Feel like you empty?

## OAB/Urges Incontinence: Primary (Initial) Treatment

- Most cases of OAB can be diagnosed and treated by primary health care providers.
- Treat OAB and urge incontinence the same.
- Treat for 6-8 weeks and reassess
- Consider voiding diary (frequency volume chart for 3 days)

# Overactive Bladder: Treatment Options

- First line therapy:
  - Behavioral therapy
- Second line therapy:
  - Medication (Anti-cholinergics, B3-Agonists)
  - Combined therapy
- Third line therapy:
  - Minimally invasive therapy
  - Surgery



## Overactive Bladder Treatment: Behavioral Therapy

- Patients should implement the following program at home:
  - Regular pelvic floor muscle exercises
  - Specified voiding schedule aimed at avoiding emergencies
  - Reduce fluid intake to 1.5 litres per day
  - Avoid caffeine and alcohol

# Overactive Bladder Treatment: Anti-cholinergic Medications

## First line treatment :

- |                  |             |                 |
|------------------|-------------|-----------------|
| • Oxybutynin IR  | generic oxy | 2.5 to 5mg QID  |
| • Tolterodine IR | Detrol      | 1 or 2mg BID    |
| • Tolterodine ER | Detrol LA   | 2 or 4mg OD     |
| • Oxybutynin ER  | Ditropan XL | to 30mg OD      |
| • Oxybutynin TDS | Oxytrol     | 3.9mg OD (2-wk) |
| • Oxybutynin ER  | Uromax      | 10 or 15mg OD   |
| • Darifenacin    | Enablex     | 7.5 or 15mg OD  |
| • Solifenacin    | Vesicare    | 5 or 10mg OD    |
| • Trospium       | Trosec      | 20mg BID        |
| • Fesoterodine   | Toviaz      | 4 or 8 mg OD    |

## Other

- |             |            |            |
|-------------|------------|------------|
| • Myrbetriq | Mirabegron | 25-50mg OD |
|-------------|------------|------------|

# Anti-Cholinergic Medications and Glaucoma

## What do you do?

- Okay, if open angle glaucoma
- May be okay for closed angle glaucoma if treated.
- If not sure, ask for the ophthalmologist “okay”, not the urologist

## Overactive Bladder Treatment: Follow-up Appointment

- Review urinalysis and culture
- Compare voiding diaries
- “Did the treatment work?”
- Any side effects (dry mouth, dry eyes, constipation, cognitive impairment) ?
- Switch to another anti-cholinergic medications,  
or
- Increase dose

## When should you refer to a urologist?

1. Uncertain diagnosis/no clear treatment plan
2. Unsuccessful therapy for OAB – after 2-3 meds?
3. Neurological disease
4. Stress incontinence concurrently
5. Hematuria without infection
6. Persistent symptoms of poor bladder emptying
7. History of previous radical pelvic or anti-incontinence surgery

## What to include in the referral?

- Urinalysis & Urine Culture
- Previous urologic/pelvic surgery
- Type of incontinence (UUI, SUI, Mixed)
- Attempted treatments
- ? Voiding diary

## Refractory OAB

- **>3 failed medical treatments**
- **Treatment Options:**
  - Intravesical Onabotulinum toxin A
  - Sacral or peripheral nerve stimulation
  - Bladder augmentation (rarely)

## OAB/UUI: Key Clinical Points

- Educate and reassure the patient
- No anti-cholinergic better than another
- Efficacy and side effects vary from individual to individual
- OK to try different medications
- Realistic expectations – not a cure
- Be careful in geriatric patients
  - Trosec 20 mg daily or bid, Detrol 2mg or 4mg, Enablex, Vesicare, Fesoterodine, Mirabegron



## Total Incontinence: Key Points

- Total incontinence: the complaint of a continuous leakage.
- This may be indicative of an abnormal communicating tract between urinary tract and other organ (commonly with the vagina)
  - i.e. vesicovaginal fistula
- Inquire about past surgical history, radiation therapy
- Needs referral and further investigation

## Overflow Incontinence: Key Points

- **Overflow incontinence: Leakage of urine due to chronic urinary retention**
- **Usually related to bladder outlet obstruction**
  - BPH or Urethral Stricture
- May also be related to a weak or “hypotonic” bladder
- **Treatment:**
  - Relief of urinary obstruction
  - If due to a weak bladder - self-catherization

## Neurogenic Bladder: Definition

- Failure of bladder function with loss of innervation
- Normal bladder:
  - Holds 350-500mL
  - Senses fullness
  - Low pressure
  - Empties >80% efficiency

# Neurogenic Bladder: Classification

- **Innervation:**
  - Parasympathetic (S2-4) – empties bladder (bladder contracts, sphincter relaxes)
  - Sympathetic (T10-L2) – fills bladder (bladder relaxes, sphincter contracts)
- **Classification:**
  - Upper motor neuron (lumbar and higher)
  - Lower motor neuron (sacral and lower)

# Neurogenic Bladder

- **Upper motor lesion:**
  - Detrusor overactivity – Above pons
  - Detrusor overactivity & discoordinated sphincter – Spinal cord (thoracic & lumbar)
- **Treatment**
  - Lower bladder pressure and treat urge incontinence – Anticholinergics, intradetrusor botulinum toxinA
  - Empty bladder – Intermittent self catheterization
  - Augment bladder (surgery) if high pressures persist

## Neurogenic Bladder

- **Lower motor lesion (sacral or lower):**
  - Detrusor atony/areflexia
  - Treat with Clean Intermittent catheterization

# Neurogenic Bladder: Autonomic Dysreflexia

## ➤ Autonomic dysreflexia

- May occur in patients with a spinal cord injury above T6
- Massive sympathetic release in response to stimulation below spinal cord lesion
- Hypertension, headaches, bradycardia, flushing above
- THIS IS A POTENTIALLY LIFE THREATENING EVENT
- Identify and stop main contributor: empty bladder, treat constipation, alleviate pain...
- Treat with alpha-blockers, sublingual nifedipine

## Incontinence: Take Home Points

- **Urinary incontinence is quite common**
- **Basic evaluation**
  - Classify incontinence on history
  - Urinalysis, Urine C&S
  - Voiding Diary
- **Always try conservative therapies (lifestyle modifications, timed voiding, pelvic floor muscle training...) before pharmacologic/surgical treatment.**



# Approach to Urinary Incontinence

