Updates in Overactive Bladder

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AAPA 2024

Disclosure

- *I have no relevant relationships with ineligible companies to disclose within the past 24 months*
- *The case studies in this lecture are fictional*

Objectives

At the conclusion of this session, participants should be able to:

- Review the definitions of overactive bladder (OAB), stress urinary incontinence, and urge urinary incontinence
- Recognize the signs and symptoms and be able to differentiate OAB, stress urinary incontinence, and urge urinary incontinence in clinical practice
- Recognize the role of urodynamic tests when treating different types of incontinence
- Identify medical, behavioral, and surgical treatment options for OAB, stress urinary incontinence, and urge urinary incontinence
- Analyze the pharmacological treatment options for OAB and urge urinary incontinence, including their potential side effects and review American Geriatrics Society Beers Criteria for OAB medications
- Discuss the role of PTNS (Percutaneous Tibial Nerve Stimulation) as a treatment option for OAB

Overactive Bladder

- "urinary urgency, usually accompanied by frequency and nocturia, with or without urgency urinary incontinence, in the absence of UTI or other obvious pathology"
- Self limiting
- Clinical diagnosis

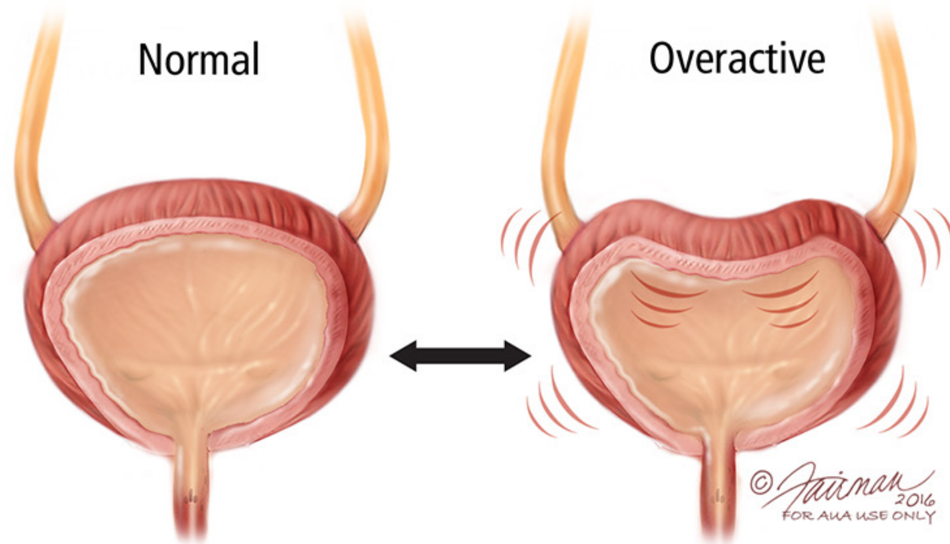
IUGA (International Urogynecological Association) and ICA (International Continence Society)

- Prevalence – up to 27% men / 47% women (AUA guidelines 2019)
- Pathophysiology: abnormal urothelium and suburothelial signaling that leads to pathologic sensation of urgency
- COST $80+ billion in the USA in 2020

Liu, Bonnie et al. Drug Therapy for Overactive Bladder. AUA Update Series 2021, Vol 40 page 193.

OAB Terms

- **Detrusor Overactivity** – urodynamic observation characterized by involuntary / spontaneous or provoked detrusor contractions during the filling phase
- **Nocturnal polyuria** - excessive (>20-30%) urine output at night
  - Treat with desmopression (DDAVP)
- **Polyuria** - > 40 ml urine / kg body weight during a 24 hr period
- **Post void residual (PVR)** – volume of fluid remaining in the bladder after completion of micturition, rule out urinary retention / ICBE
- **Urgency** – sudden desire to void that is difficult to defer
- **Urinary Frequency** - > 8 micturitions in 24 hr period



Overactive Bladder (OAB)

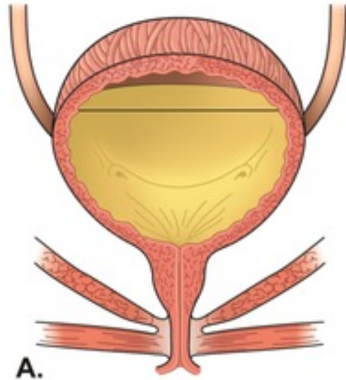
Definition

- Syndrome NOT a disease
- Different from stress urinary incontinence (SUI)
- Can be associated with Urge Urinary Incontinence (UUI)
- Urgency
- Urinary Frequency
- Nocturia

Lukacz, et al. Urgency urinary incontienence/overactive bladder in females: Treatment; Up-to-date Accessed 2/14/2022.

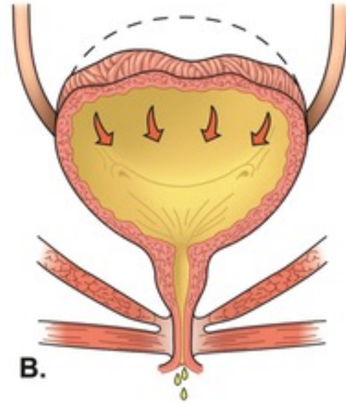
https://www.urologyhealth.org/urology-a-z/o/overactive-bladder-(oab)

Normal



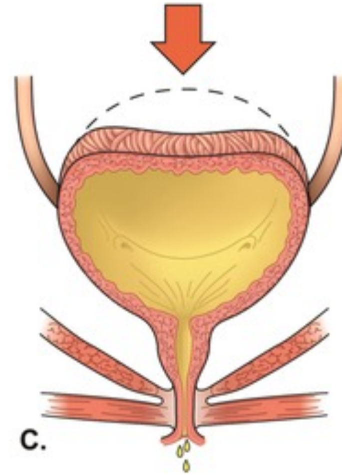
The bladder stays relaxed and the urethra stays contracted and closed until the patient is ready to void.

Urgency Incontinence



Bladder muscle contracts before the patient is ready to void.

Stress Incontinence



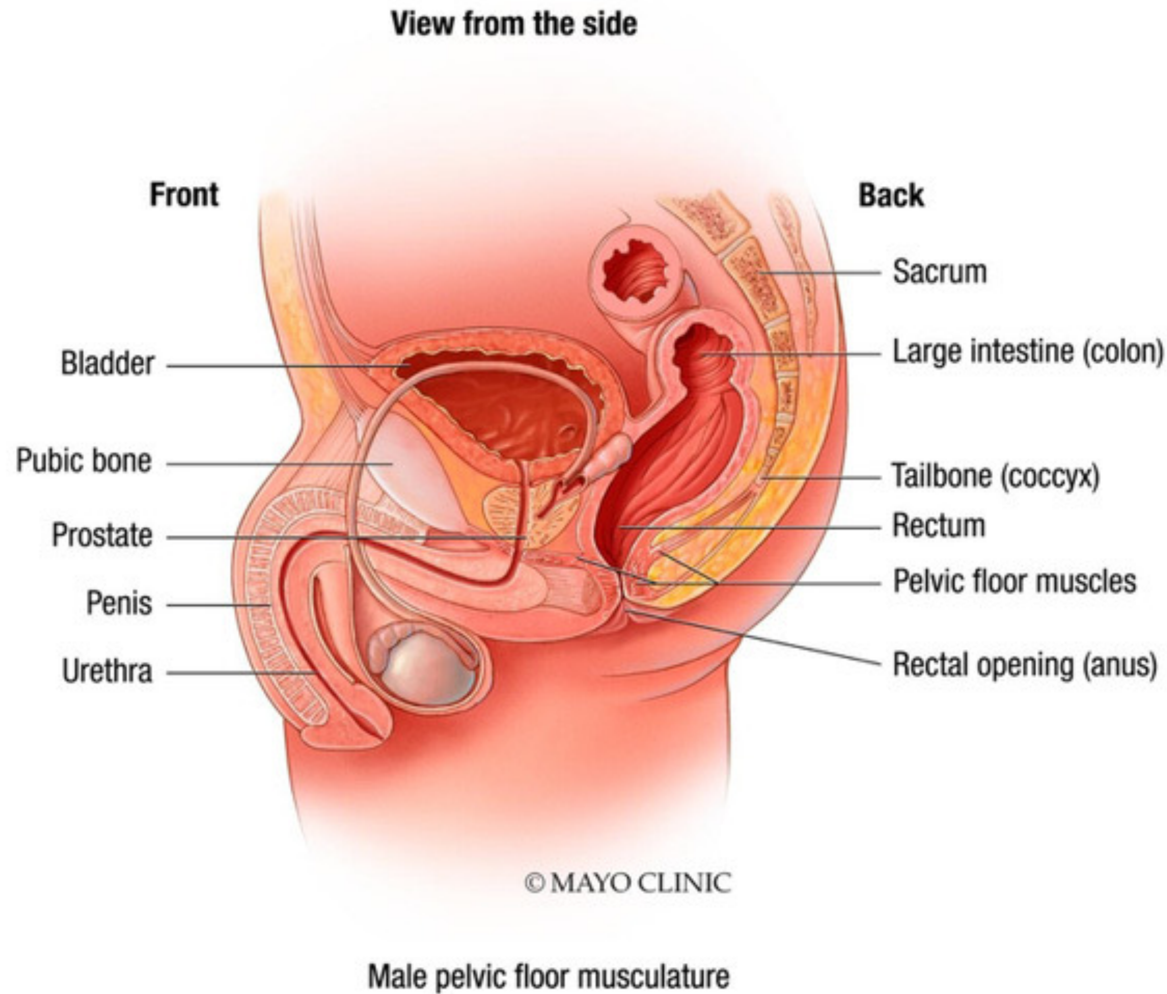
Urethra is too weak to stay closed during increased intra-abdominal pressure.

Urge Urinary Incontinence

Definition

- Involuntary loss of urine
- Urge to void immediately and often associated with involuntary urine leakage
- Temporary or persistent
- Quality of life

https://urogynecology.nm.org/urinary-incontinence.html



Male pelvic floor musculature

Stress Urinary Incontinence

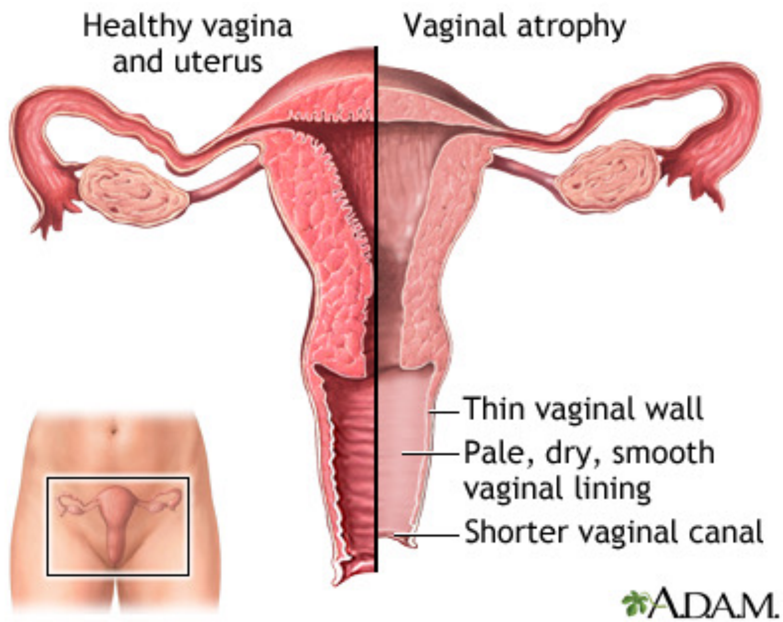
Involuntary and sudden loss of urine

Due to weak muscles in the pelvic floor and urethral sphincter

Leakage is caused by increased intraabdominal pressure usually d/t physical activities such as laughing, sneezing, straining, coughing, or exercising.

On UDS – due to bladder neck/ urethral hypermobility and intrinsic sphincter deficiency (ISD)

https://www.mayoclinichealthsystem.org/hometown-health/speaking-of-health/kegels-are-for-men-too



Genitourinary Syndrome of Menopause

GSM

Vulvovaginal atrophy and LUTS (lower urinary tract symptoms)

Pathophysiology: Decrease in estrogen causes increase in vulvovaginal atrophy which results in loss of urethral and bladder elasticity

Treatment: Vaginal Estrogen

Vaginal atrophy on exam:

- Shiny, pale dry tissue +/- petechiae
- Thinning of vaginal walls
- No vaginal rugae / vagina shorter / narrower

https://www.mountsinai.org/health-library/diseases-conditions/vaginal-dryness

Questionnaire for patients

Name: ______________________________ Date: ________________ MRN #________

OAB-q short form symptom bother

This questionnaire asks about how much you have been bothered by selected bladder symptoms during the past 4 weeks. Please place a ✓ or ✗ in the box that best describes the extent to which you were bothered by each symptom during the past 4 weeks. There are no right or wrong answers. Please be sure to answer every question.

During the past 4 weeks, how bothered were you by. . .	Not at all	A little bit	Some-what	Quite a bit	A great deal	A very great deal
1. An uncomfortable urge to urinate?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
2. A sudden urge to urinate with little or no warning?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
3. Accidental loss of small amounts of urine?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
4. Nighttime urination?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
5. Waking up at night because you had to urinate?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
6. Urine loss associated with a strong desire to urinate?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

Symptoms of OAB

- Urgency with urination
- Urge urinary incontinence (Wet OAB)
- Difficult to control urination
- Frequency of urination usually > 8 x in 24 hr period
- Nocturia 2+ per night

- Worsens with age
- Prevention: healthy weight / exercise / limit caffeine and etoh / no smoking / pelvic floor exercises

Past Medical History

- Questions to ask
  - Pregnancy / vaginal delivers / size of baby
  - Post menopausal
  - Pelvic surgeries / radiation
  - Genitourinary History
  - Recurrent UTIs

Physical Exam

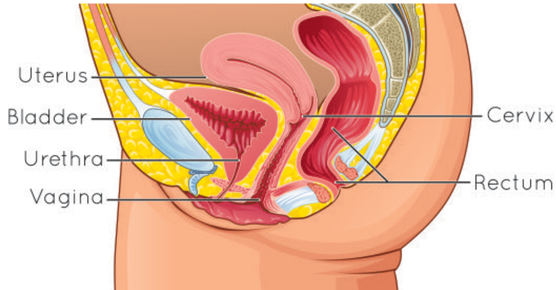
- Abdominal / Rectal / GU / pelvic
  - Rule out pelvic prolapse / vaginal atrophy
    - Cystocele
    - Rectocele
    - enterocele
- Cognitive function
  - Rule out dementia
- Post void Residual to rule out urinary retention
- Urine analysis – rule out infection

Chaperone present for pelvic exams and document

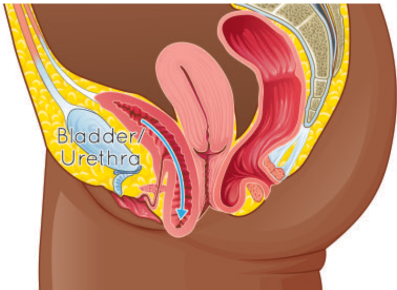
- CPT code 99459 (Pelvic Exam) captures the 4 minutes of clinical staff time associated with chaperoning a pelvic exam

https://www.aapc.com/discuss/threads/add-on-code-99459.196097/#:~:text=CPT%20code%2099459%20(Pelvic%20Exam,with%20chaperoning%20a%20pelvic%20exam.

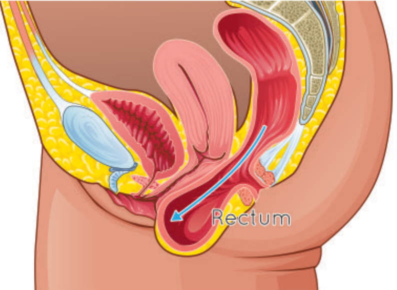
Pelvic Exam



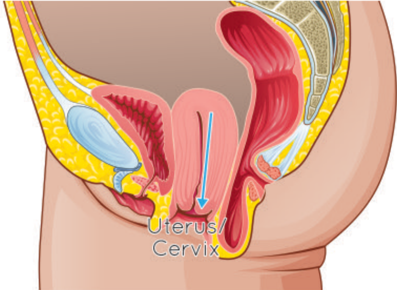
Anatomy without prolapse



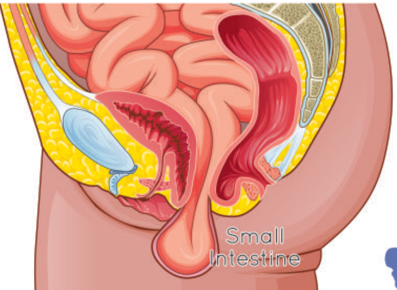
Cystocele / Cystourethrocele



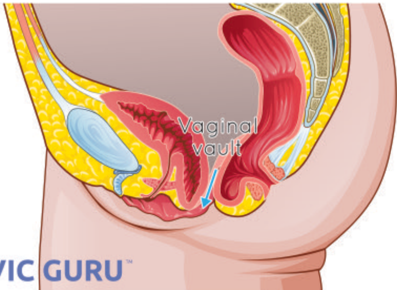
Rectocele



Uterine prolapse



Enterocele



Vaginal vault prolapse

Case Study

- Mrs LUTs is a 77 yo female with PMhx for HTN
  - 2 vaginal deliveries Full Term
  - Medications: Lisinopril
- CC: Urge urinary incontinence worsening x 3 years with rare SUI (stress urinary incontinence) Nocturia 2x a night
  - Always leaks when she gets up in the morning
  - States symptoms worsened after she stopped dancing
  - Denies any "bulge in her vaginal area"
  - Denies rUTIs
  - Spends lots of $$$$ on adult diapers / pads
- OAB questionnaire
- Work up
  - UA micro negative
  - PVR 2 ml
  - PE: pelvic organ prolapse, grade 1 cystocele
  - Obtain Voiding Diary

Urology Questionnaire

WELLSTAR Medical Group

UROLOGY

QUESTIONNAIRE

SUBJECTIVE UROLOGICAL HISTORY

NAME Mrs LUTS DATE 5/5/2024

Incontinence	YES	NO
1. Do you accidentally leak urine?	✓	
2. How many years have you had leakage of urine? 3+		
3. Do you lose urine with ....? [check all that apply]		
a. Coughing		✓
b. Laughing		rare
c. Sneezing		✓
d. Exercising		✓
e. Going from sitting to standing position?	✓	
f. Sexual Activity?		✓
4. Does urine leak out before you get to the restroom?	✓	
5. Can you NOT hold urine when you feel the need to void?	occas	
6. Number of pads per day to absorb lost urine? 2-3 sometimes more		

Voiding	YES	NO
7. Do you have to strain to void?		✓
8. Do you feel that your stream or urine flow is weak?		✓
9. Do you use the bathroom frequently?	✓	
a. More than every one to two hours?	yes at times	
b. Have you tried any medicines previously to help?		✓
10. How many times do you get up at night to void?	2X	
11. Can you feel your bladder dropping?		✓
a. If so, can you manually push it back?		✓
12. Do you have any vaginal pain?		✓
13. Do you have any constipation?		✓
14. Number of pregnancies 2 Vaginally 2 C-Section ____		
15. Do you do Kegel Exercises?		✓
16. Have you had any bladder/GYN Surgeries? ____		✓

9/27/18 GT

Voiding Diary

- Look at frequency – volume chart
- What is NORMAL
  - Voiding every 3-4 hours / median 6x a day
- Polydipsia related frequency -> managed with behavior / limit fluids
  - Calculate the urine output overnight
  - Excessive fluid intake can present as OAB

Assessing your overactive bladder (OAB) symptoms:

Use this diary to help keep track of your bladder habits.

FOLLOW THE GUIDELINES BELOW

- **Keep a diary for 3 days.** This way, your doctor can get a better understanding of your symptoms over time. Any 3 days you choose is fine
- **Begin your diary when you wake up.** Take notes throughout the day, and continue until the next morning
- During the day, **write down how much liquid you drink.** As well as you can, log the specific amount you have with each serving. Most beverage containers list the number of ounces they contain
- **Take note of how much you urinate during the day.** Your doctor may recommend using a special collection cup, which can help you correctly measure the amount of urine
- **If you have a wetting accident, write down when and where it happened.** It may reveal a pattern and help your doctor develop a treatment plan for you

Don't forget to bring your diary on your next visit to the doctor's office

3-Day Bladder Diary

Day 1	Fluids		Urination				Accidents		
DATE DD/MM/YY	What kind?	How much?	How many times?	How much?	Did you feel a strong urge to urinate?	What activity did this interrupt?	Did you have an accident?	How much did you leak?	What were you doing at the time?
6am-9am				S · M · L	Yes · No		Yes · No	S · M · L	
9am-12pm				S · M · L	Yes · No		Yes · No	S · M · L	
12pm-3pm				S · M · L	Yes · No		Yes · No	S · M · L	
3pm-6pm				S · M · L	Yes · No		Yes · No	S · M · L	
6pm-9pm				S · M · L	Yes · No		Yes · No	S · M · L	
9pm-12am				S · M · L	Yes · No		Yes · No	S · M · L	
12am-3am				S · M · L	Yes · No		Yes · No	S · M · L	
3am-6am				S · M · L	Yes · No		Yes · No	S · M · L	

Day 2	Fluids		Urination				Accidents		
DATE DD/MM/YY	What kind?	How much?	How many times?	How much?	Did you feel a strong urge to urinate?	What activity did this interrupt?	Did you have an accident?	How much did you leak?	What were you doing at the time?
6am-9am				S · M · L	Yes · No		Yes · No	S · M · L	
9am-12pm				S · M · L	Yes · No		Yes · No	S · M · L	
12pm-3pm				S · M · L	Yes · No		Yes · No	S · M · L	
3pm-6pm				S · M · L	Yes · No		Yes · No	S · M · L	
6pm-9pm				S · M · L	Yes · No		Yes · No	S · M · L	
9pm-12am				S · M · L	Yes · No		Yes · No	S · M · L	
12am-3am				S · M · L	Yes · No		Yes · No	S · M · L	
3am-6am				S · M · L	Yes · No		Yes · No	S · M · L	

Day 3	Fluids		Urination				Accidents		
DATE DD/MM/YY	What kind?	How much?	How many times?	How much?	Did you feel a strong urge to urinate?	What activity did this interrupt?	Did you have an accident?	How much did you leak?	What were you doing at the time?
6am-9am				S · M · L	Yes · No		Yes · No	S · M · L	
9am-12pm				S · M · L	Yes · No		Yes · No	S · M · L	
12pm-3pm				S · M · L	Yes · No		Yes · No	S · M · L	
3pm-6pm				S · M · L	Yes · No		Yes · No	S · M · L	
6pm-9pm				S · M · L	Yes · No		Yes · No	S · M · L	
9pm-12am				S · M · L	Yes · No		Yes · No	S · M · L	
12am-3am				S · M · L	Yes · No		Yes · No	S · M · L	
3am-6am				S · M · L	Yes · No		Yes · No	S · M · L	

https://urologyaustin.com/wp-content/uploads/2015/03/057-0226-PM_Bladder-Diary.pdf

Voiding Diary Specifics

- Voiding Diary – Prefer 2-3 days of information
  - On each day: wake up time // Bedtime
  - Measure each void. Write it down in ml or oz, recorded on the chart to the nearest hour
  - Document degree of urgency for each void (0 – 3: 0 = no urgency, 3 = very urgent)
  - Record of all “wet” events and degree of wetness. For example: dry, damp/dribble, wet/stream, soaked/flood or by pad weighing.
    - What you were doing when you leak – examples – standing up / getting your leggings off etc
  - Record of pad/underwear alterations
  - Record fluid intake in ml / cc and what it is
    - Coffee / water / wine etc.

Voiding Diary

Voiding Diary Instructions And Log

If you have any questions and/or concerns, please contact Wellstar Urology at 770-428-4475.

- ✓ Purchase a measuring cup that measures in CC or ML.
- ✓ Urinate into the measuring cup each time for two days to measure the amount of urine collected. Fill each amount into the "Amount Voided" column.
- ✓ Log all your fluids into "Fluid Intake" in CC or ML. If measuring in ounces, please multiply the ounce by 30 to convert to CC and fill this "CC" amount into the "Amount Voided" column.)
- ✓ Total each column "Amount Voided" and "Fluid Intake" each day.
- ✓ Bring the completed form back to your follow up appointment.

Voiding Diary

Name: Mrs LUTS

DOB: 1/1/1947

Date	Time	Amount Voided (CC or ML)	Fluid Intake (CC or ML)	Comments
5/1/2024	06:30	400 mL + leaked.		
	08:00		360 cc	coffee
	09:30	150 cc		slight leak:
	10:45	150 cc		
	10:45		360 cc	coffee
	11:30	75 cc		slight leak
	12:45	75 cc		
	1:00 pm		360 cc	Diet coke
	1:45	150 cc		
	2:50	125 cc	200 cc	H_2O
	4:00	150 cc		
	4:30		240 cc	H_2O
	5:45.	150 cc		
	6:30		240 cc	H_2O
	7:00	150 cc	120 cc	Red wine
	8 45	150 cc		
	9:00 pm		150 cc	H_2O
	9:45	100 cc		
	12 00	125 cc		slight leak
	4:00 am	150 cc		slight leak

Total: 2100 cc 1930 cc

Case Study

- Voiding Diary Summary
  - + frequency
  - Voids from 75-400 ml
  - + leakage
  - Drinks coffee/ diet coke/ wine and water

Case Study

- Reviewed Voiding Diary
- Discussed behavioral modifications / Bladder training
- Healthy bladder diet education provided - limit bladder irritants
- Discussed bladder training
- Pelvic Floor Exercises – she does water aerobics 3x a week at the YMCA
- What to do?

Case Study

- Treatment:
  - Healthy bladder diet / pelvic floor exercises – referral to PFPT
    - Limit the coffee/ soda / wine
  - Rx Virbegron 75 mg daily
  - Topical estrace cream daily x 2 weeks then 3x a week
- Follow up in 6-8 weeks to re-evaluate

Case Study

- Follow up appointment
  - PVR 0 ml
  - Some improvement in urgency / frequency / leakage
  - Continue to encourage behavioral modifications
  - Stressed importance of doing pelvic floor exercises

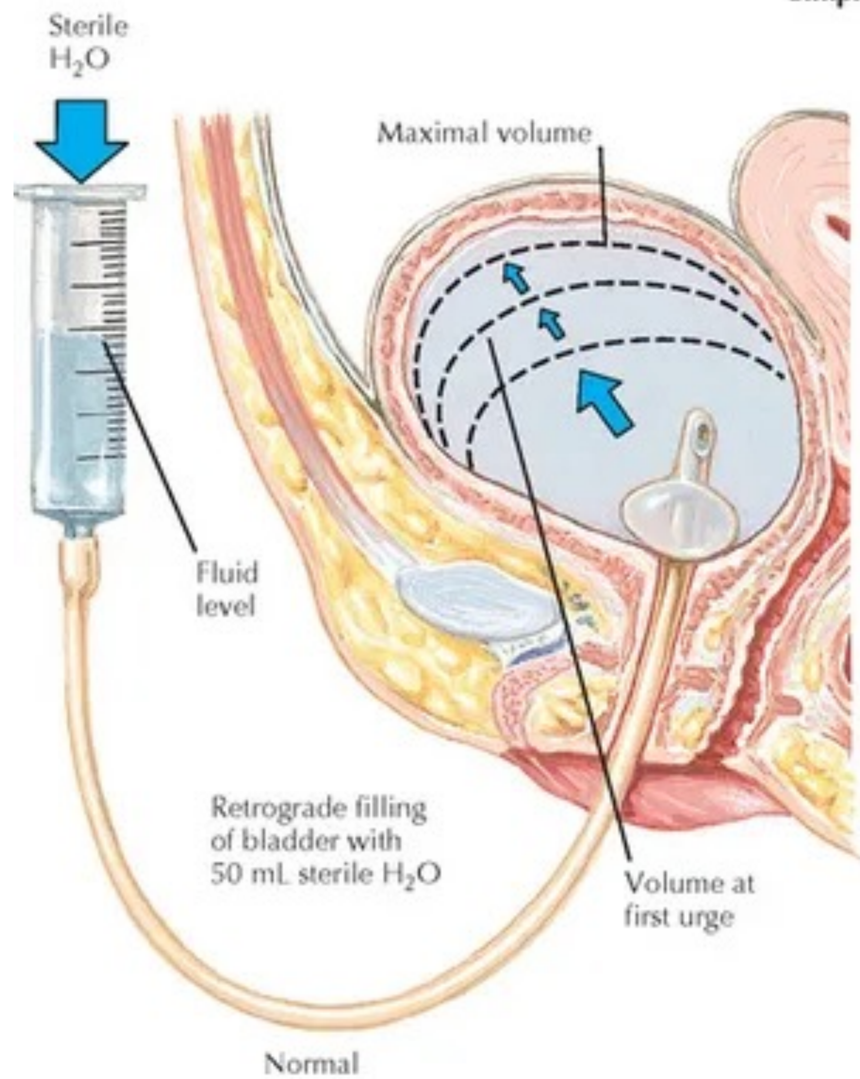
OAB Workup Review

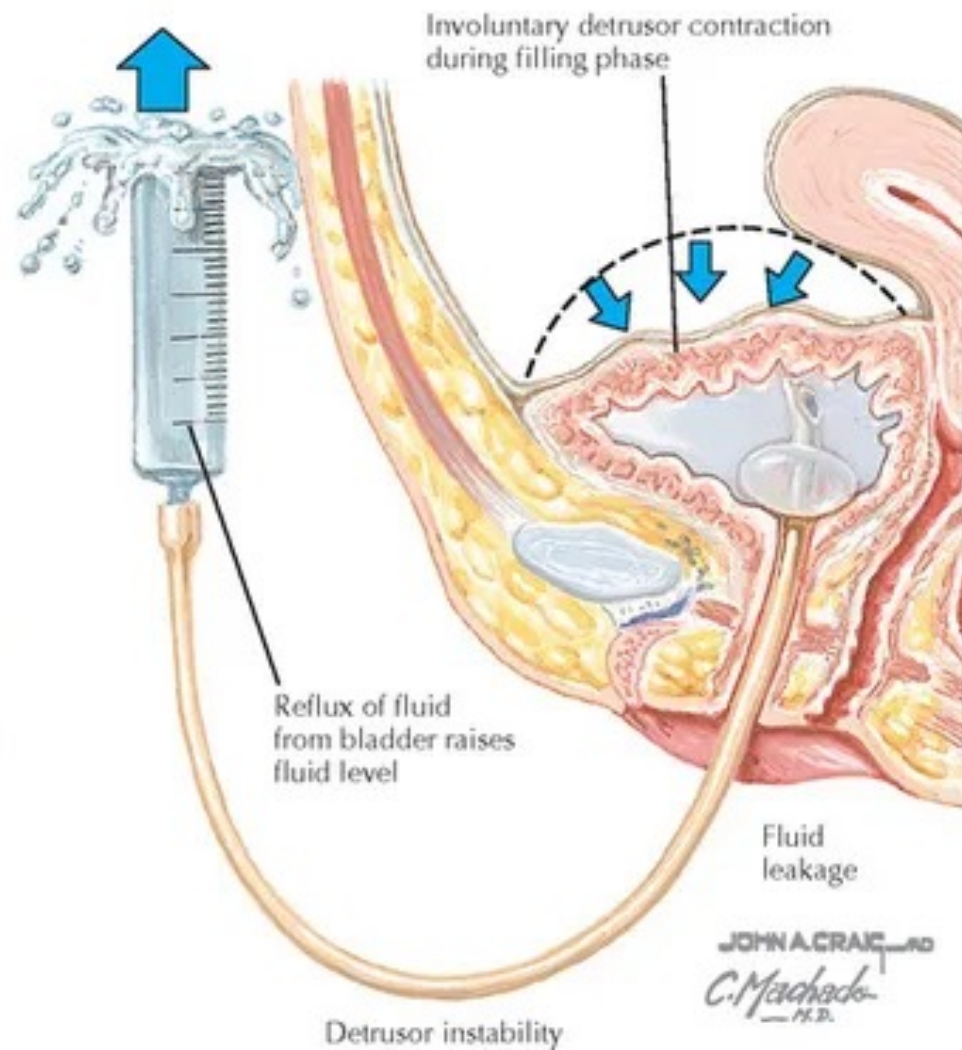
- Voiding Diary
- Urinalysis / Urine cx
- Pelvic exam
- No role for urodynamic study / cystoscopy / imaging in the **INITIAL** workup
  - UDS important to rule out other etiology or confirm diagnosis of OAB and UUI vs SUI
- Discuss treatment options
- Shared decision making when discussion treatment options
  - Every patient is different!

Urodynamic Testing indicated with LUTS

- Evaluates how well the bladder, urethra and urethral sphincter muscles are working
- Cystometry = measures the pressure inside your bladder during the filling stage (bladder capacity)
  - Cough and sneeze to eval for SUI
  - SUI is confirmed if there is involuntary leakage of urine with increase in abdominal pressure WITHOUT detrusor contraction
  - Measures bladder pressure and urine flow as you urinate
  - DO Detrusor overactivity / involuntary contractions of the detrusor muscle
- Electromyography = measures the activity of the pelvic floor muscles and nerves
- Pressure flow study = simultaneously measures the pressure inside your bladder and the flow of urine while peeing.
- Uroflowmetry = measures the flow of urine, how fast the urine comes out
  - Looking for weak bladder muscles or bladder outlet obstruction
- PVR - for urinary retention
- MUI – d/t DO and SUI

Simple cystometry





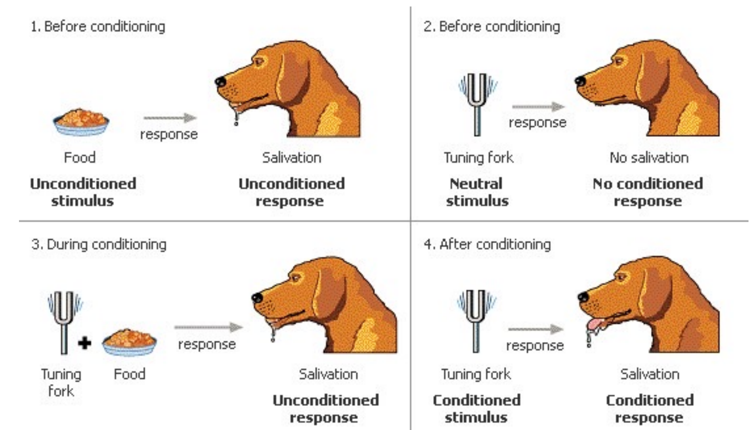
Treatment Options

- Shared Decision Making
  - Based on QoL

- First Line – Behavioral Modifications
- Second Line – pharmacotherapy
- Third Line

First Line Therapy

- Behavioral Modifications
  - Diet – healthy bladder diet
  - Bladder Training (change bladder habits / delayed voiding)
  - Pelvic Floor Exercises / referral to PT
  - Weight loss
    - 8% weight loss in obese women caused 42% decrease in s/sx compared to 26% in control
  - Vaginal atrophy – topical estrogen cream
  - Timeframe – 6-12 weeks



Lukacz, E et al. Urgency Urinary incontinence / overactive bladder in females: Treatment www.uptodate.com accessed 2/12/2022

Avoid these bladder irritants				
All alcoholic beverages	Carbonated Drinks	Cranberries	NutraSweet	Saccharin
Apples	Champagne	Fava beans	Onions (raw)	Sour cream
Apple juice	Cheese	Grapes	Peaches	Soy sauce
Bananas	Chicken livers	Guava	Pickled herring	Strawberries
Beer	Chilies/Spicy foods	Lemon juice	Pineapple	Tea
Brewer's Yeast	Chocolate	Lentils	Plums	Tomatoes
Canned Figs	Citrus fruits	Lima Beans	Prunes	Vinegar
Cantaloupes	Coffee	Nuts	Raisins	Vitamins-buffered with aspartame
	Corned beef	Mayonnaise	Rye bread	Yogurt

Healthy Bladder Diet

https://urogyn.coloradowomenshealth.com/blog/overactive-bladder-diet.html

Bladder Training

https://www.wikihow.com/Do-Bladder-Training-for-Sudden-Urges-to-Pee

Pelvic Floor Exercises – not just kegels

Second Line Therapy

- Can combine with 1st line therapy
- Medications
  - Anti-muscarinic agents
    - ER (extended-release medications preferred)
    - Higher risk of dementia
  - Beta 3 adrenergic agonists
    - $$$
  - COMBO
  - Takes up to 12 weeks to notice full effects
  - Risk of urinary retention, monitor with PVR
  - Use in caution with PVRs > 250-300 ml

https://dx.doi.org/10.1016/j.juro.2021.09.079 Vol. 188, 2455-2463 December 2021

Pharmacological Treatments

Anti-muscarinic agents

- MOA – stimulates acetylcholine to reduce smooth muscle contraction in the bladder
- Increase bladder capacity / decrease urgency
- Generic options / cheaper
- Can cause cognitive dysfunction
- Side Effects: dry mouth and eyes, constipation
- Contraindications
- Examples: trospium* / darifenacin

Liu, Bonnie et al. Drug Therapy for Overactive Bladder. AUA Update Series 2021, Vol 40 page 193

Beta 3 adrenergic agonists

- Mirabegron * (risk of HTN)
- Vibegron
- MOA – smooth muscle relaxation in the bladder
- Less side effects compared to anti-muscarinic agents
- $$$
- Contraindications
  - Uncontrolled HTN
  - Child Pugh class B / ESRD GFR < 30
  - Flecainide / propafenone cannot take 50 mg dose

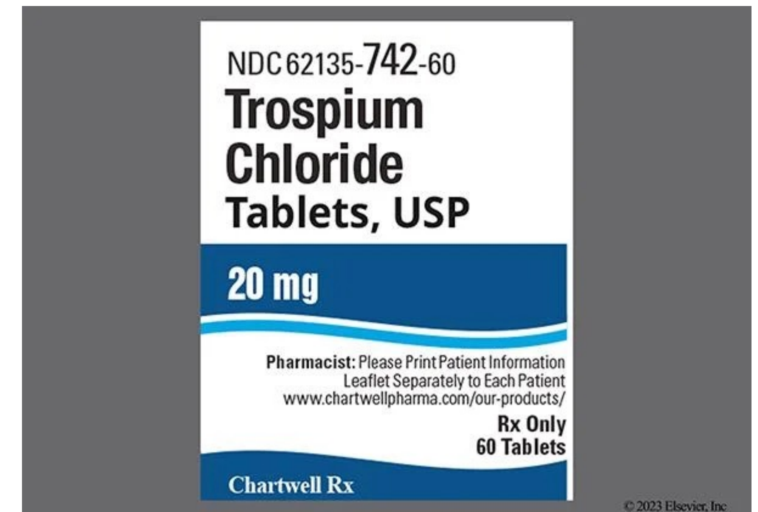
Anti-Muscarinic agents

- **Oxybutynin / Tolterodine**
  - Comes in immediate or extended release
    - Prefer extended release to min. SE
  - Cheap / generic
  - Not well tolerated
- **Oxybutynin**
  - Highly lipophilic / ***crosses the blood brain barrier resulting in CNS adverse effects***
  - Can be given transdermal or ER dosing which decreases SE
  - Avoid in elderly

Liu, Bonnie et al. Drug Therapy for Overactive Bladder. AUA Update Series 2021, Vol 40 page 193.

AUA Update Series 2021 OAB

- **Trospium**
  - less likely to pass the blood brain barrier / take at least ONE hour prior to food
  - Food significantly decreases bioavailability
  - M2 / M3
  - No need to adjust for hepatic dz / only AM NOT metabolized by CYp3A4
  - Study UK – patients who use AM (anti-muscarinic agents) have 20% increased risk of Dementia in the future



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AUA Update Series 2021 OAB

- Combo Beta 3 adrenergic agonists and AM drugs
  - Improvements in volume voided / frequency / urgency and QOL
  - BESIDE Study - > 65 yo placed on solifenasin 5 mg and mirbegron 50 mg compared to solifenasin 5 mg
    - Showed noticeable improvement in LUTS

- Role of PDE5 inhibitors
  - Tadalafil – FDA approved for LUTS in men with BPH
  - MOA – decreases contractions of detrusor muscle
  - ? FUTURE of Tadalafil for OAB

Liu, Bonnie et al. Drug Therapy for Overactive Bladder. AUA Update Series 2021, Vol 40 page 193.

Drake MJ, Chapple C, Esen AA, Athanasiou S, Cambronero J, Mitcheson D, Herschorn S, Saleem T, Huang M, Siddiqui E, Stölzel M, Herholdt C, MacDiarmid S; BESIDE study investigators. Efficacy and Safety of Mirabegron Add-on Therapy to Solifenacin in Incontinent Overactive Bladder Patients with an Inadequate Response to Initial 4-Week Solifenacin Monotherapy: A Randomised Double-blind Multicentre Phase 3B Study (BESIDE). Eur Urol. 2016 Jul;70(1):136-145. doi: 10.1016/j.eururo.2016.02.030. Epub 2016 Mar 8. PMID: 26965560.

Pharmacological Treatment

Recommend Follow up 4-6 weeks after starting medication

If no improvement – titrate medication / combo

Solifenacin / Trospium PLUS mirabegron

If some improvement – titrate medication

Obtain PVR – if >1/3 total voided amount watch closely

Cannot tolerate side effects -> 3rd line therapy

Assess role of topical estrace cream

Side Effects: dry mouth / constipation / dry eyes / blurred vision/ dyspepsia/ Urinary Retention / impaired cognitive function

https://dx.doi.org/10.1016/j.juro.2021.09.079 Vol. 188, 2455-2463 December 2021

Beers Criteria

American Geriatric Society updates Beers Criteria

- Criteria:
  - Potentially inappropriate medications in older adults
  - Potentially inappropriate medications to avoid in older adults with certain conditions
  - Medications to be used with caution in older adults
  - Medication combinations that may lead to harmful interactions
  - List of medications that should be avoided / dosed differently in those with poor renal function

OAB and Beer

- Updated in 2019
- Anticholinergics / Anti-muscarinic agents made the LIST
- Prescribe with caution in the elderly
  - anti-muscarinic agents are contraindicated in elderly on oral potassium supplements d/t slowing gastric motility
  - **Trospium is considered the safest (lowest DDI – drug drug interactions)**

AGS BEERS CRITERIA
FOR POTENTIALLY INAPPROPRIATE MEDICATION USE IN OLDER ADULTS

FROM THE AMERICAN GERIATRICS SOCIETY

This clinical tool, based on *The AGS 2012 Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults (AGS 2012 Beers Criteria)*, has been developed to assist healthcare providers in improving medication safety in older adults. Our purpose is to inform clinical decision-making concerning the prescribing of medications for older adults in order to improve safety and quality of care.

Originally conceived of in 1991 by the late Mark Beers, MD, a geriatrician, the *Beers Criteria* catalogues medications that cause adverse drug events in older adults due to their pharmacologic properties and the physiologic changes of aging. In 2011, the AGS undertook an update of the criteria, assembling a team of experts and funding the development of the AGS 2012 *Beers Criteria* using an enhanced, evidence-based methodology. Each criterion is rated (quality of evidence and strength of evidence) using the American College of Physicians' Guideline Grading System, which is based on the GRADE scheme developed by Guyatt et al.

The full document together with accompanying resources can be viewed online at www.americangeriatrics.org.

INTENDED USE

The goal of this clinical tool is to improve care of older adults by reducing their exposure to Potentially Inappropriate Medications (PIMs).

- This should be viewed as a guide for identifying medications for which the risks of use in older adults outweigh the benefits.
- These criteria are not meant to be applied in a punitive manner.
- This list is not meant to supersede clinical judgment or an individual patient's values and needs. Prescribing and managing disease conditions should be individualized and involve shared decision-making.
- These criteria also underscore the importance of using a team approach to prescribing and the use of non-pharmacological approaches and of having economic and organizational incentives for this type of model.
- Implicit criteria such as the STOPP/START criteria and Medication Appropriateness Index should be used in a complementary manner with the 2012 AGS *Beers Criteria* to guide clinicians in making decisions about safe medication use in older adults.

The criteria are not applicable in all circumstances (eg, patient's receiving palliative and hospice care). If a clinician is not able to find an alternative and chooses to continue to use a drug on this list in an individual patient, designation of the medication as potentially inappropriate can serve as a reminder for close monitoring so that the potential for an adverse drug effect can be incorporated into the medical record and prevented or detected early.

TABLE 1: 2012 AGS Beers Criteria for Potentially Inappropriate Medication Use in Older Adults

Organ System/ Therapeutic Category/Drug(s)	Recommendation, Rationale, *Quality of Evidence (QE) & Strength of Recommendation (SR)*
Anticholinergics (excludes TCAs)	
First-generation antihistamines (as single agent or as part of combination products) ■ Brompheniramine ■ Carbinoxamine ■ Chlorpheniramine ■ Clemastine ■ Cyproheptadine ■ Dexbrompheniramine ■ Dexchlorpheniramine ■ Diphenhydramine (oral) ■ Doxylamine ■ Hydroxyzine ■ Promethazine ■ Triprolidine	**Avoid.** Highly anticholinergic; clearance reduced with advanced age, and tolerance develops when used as hypnotic; increased risk of confusion, dry mouth, constipation, and other anticholinergic effects/toxicity. Use of diphenhydramine in special situations such as acute treatment of severe allergic reaction may be appropriate. *QE = High (Hydroxyzine and Promethazine), Moderate (All others); SR = Strong*
Antiparkinson agents ■ Benztropine (oral) ■ Trihexyphenidyl	**Avoid.** Not recommended for prevention of extrapyramidal symptoms with antipsychotics; more effective agents available for treatment of Parkinson disease. *QE = Moderate; SR = Strong*

Table 1 (continued on page 2)

Table 1 (continued from page 1)

TABLE 1: 2012 AGS Beers Criteria for Potentially Inappropriate Medication Use in Older A

Organ System/ Therapeutic Category/Drug(s)	Recommendation, Rationa *Quality of Evidence (QE) & Strength of Recon*
Antispasmodics ■ Belladonna alkaloids ■ Clidinium-chlordiazepoxide ■ Dicyclomine ■ Hyoscyamine ■ Propantheline ■ Scopolamine	**Avoid except in short-term palliative car oral secretions.** Highly anticholinergic, uncertain effectiveness. *QE = Moderate; SR = Strong*
Antithrombotics	
Dipyridamole, oral short-acting* *(does not apply to the extended-release combination with aspirin)*	**Avoid.** May cause orthostatic hypotension; more effect available; IV form acceptable for use in cardiac *QE = Moderate; SR = Strong*
Ticlopidine*	**Avoid.** Safer, effective alternatives available. *QE = Moderate; SR = Strong*
Anti-infective	
Nitrofurantoin	**Avoid for long-term suppression; avoid in CrCl <60 mL/min.** Potential for pulmonary toxicity; safer alternati efficacy in patients with CrCl <60 mL/min due concentration in the urine. *QE = Moderate; SR = Strong*
Cardiovascular	
Alpha$_1$ blockers ■ Doxazosin ■ Prazosin ■ Terazosin	**Avoid use as an antihypertensive.** High risk of orthostatic hypotension; not recon treatment for hypertension; alternative agents benefit profile. *QE = Moderate; SR = Strong*
Alpha agonists ■ Clonidine ■ Guanabenz* ■ Guanfacine* ■ Methyldopa* ■ Reserpine (>0.1 mg/day)*	**Avoid clonidine as a first-line antihyperte ers as listed.** High risk of adverse CNS effects; may cause br orthostatic hypotension; not recommended as for hypertension. *QE = Low; SR = Strong*
Antiarrhythmic drugs (Class Ia, Ic, III) ■ Amiodarone ■ Dofetilide ■ Dronedarone ■ Flecainide ■ Ibutilide ■ Procainamide ■ Propafenone ■ Quinidine ■ Sotalol	**Avoid antiarrhythmic drugs as first-line t fibrillation.** Data suggest that rate control yields better bal harms than rhythm control for most older adul Amiodarone is associated with multiple toxiciti disease, pulmonary disorders, and QT interval *QE = High; SR = Strong*
Disopyramide*	**Avoid.** Disopyramide is a potent negative inotrope an induce heart failure in older adults; strongly an antiarrhythmic drugs preferred. *QE = Low; SR = Strong*
Dronedarone	**Avoid in patients with permanent atrial f heart failure.** Worse outcomes have been reported in patien darone who have permanent atrial fibrillation c general, rate control is preferred over rhythm c fibrillation. *QE = Moderate; SR = Strong*
Digoxin >0.125 mg/day	**Avoid.** In heart failure, higher dosages associated with benefit and may increase risk of toxicity; decre may increase risk of toxicity. *QE = Moderate; SR = Strong*

Table 1

Rutman, Matthew P et al. "Overactive Bladder Prescribing Considerations: The Role of Polypharmacy, Anticholinergic Burden, and CYP2D6 Drug–Drug Interactions." Clinical drug investigation vol. 41,4 (2021): 293-302. doi:10.1007/s40261-021-01020-x

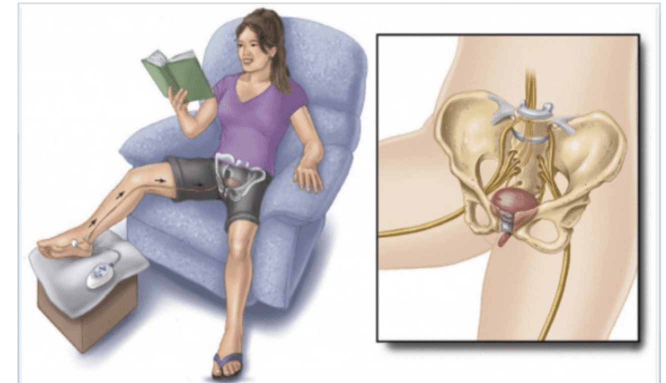
Third Line Therapy for OAB

- Percutaneous Tibial Nerve Stimulation
- Botox
- Implantable Tibial Nerve Stimulation
- SNS

Smith, et al What's on the Horizon for Implantable Tibial Nerve Stimulation 01 Jun 2022

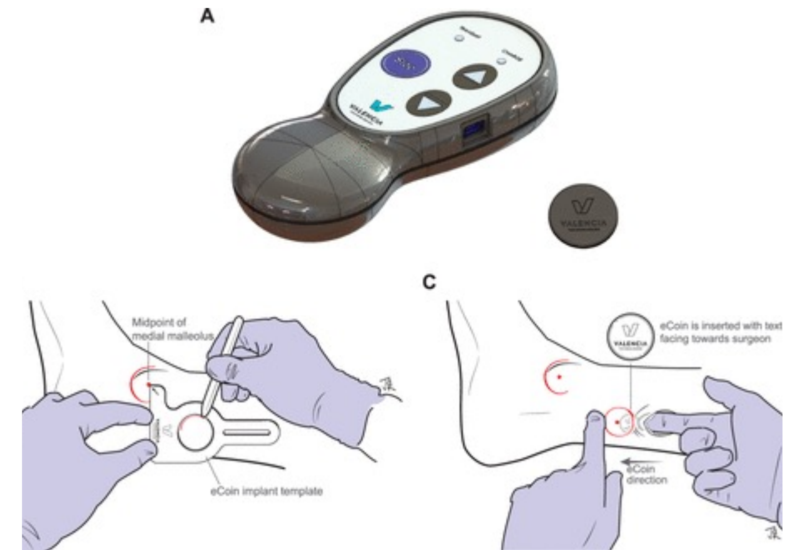
PTNS

- PTNS – Peripheral tibial nerve stimulation
- Started in 1983 / FDA approval 2005
  - Less invasive
  - Acupuncture-like electrical nerve stimulation
  - Weekly for 12 weeks / 30 minutes each session
  - Needle placed medially behind the ankle with mild electrical stimulation
  - Shown to reduce OAB s/sx and improve quality of life
  - Decreases incontinence episodes
  - Decreases Frequency
  - Increases bladder capacity
  - Delays detrusor overactivity
- *BCBS states it is still "experimental"*



Implantable / Peripheral Neurostimulator

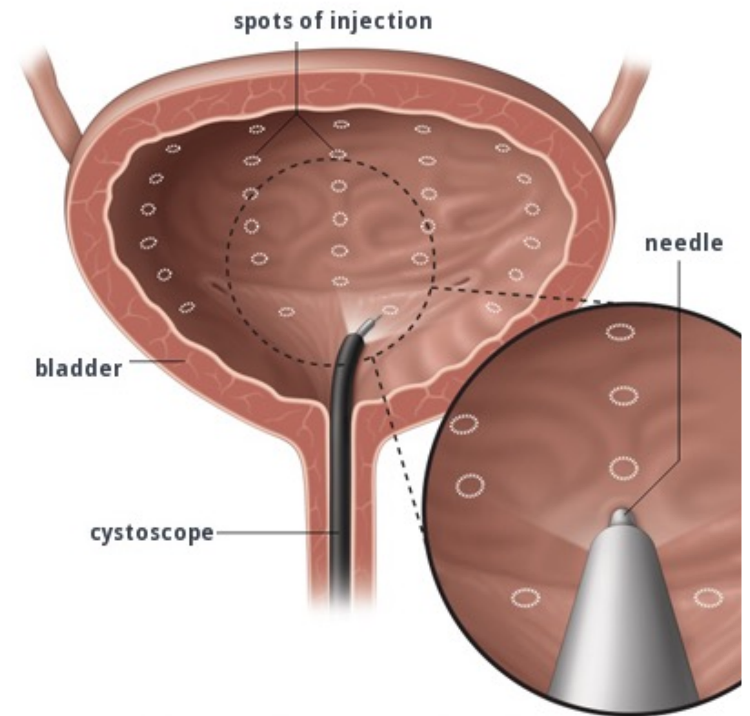
- eCoin Peripheral Neurostimulator System
  - FDA Approved March 2022
  - Indication – Urge Urinary Incontinence
  - Implanted into the ankle
  - Not MRI compatible
  - Provides Tibial nerve stimulation 2x a week
  - 3 year battery life
  - Added to AUA / SUFU guidelines May 2024
- Revi System (prev RENOVA)
  - FDA approved marketing of device 2023
  - Tibial neurostimulator device for UUI
  - OASIS study



https://www.fda.gov/medical-devices/recently-approved-devices/ecoin-peripheral-neurostimulator-p200036https://valenciatechnologies.com/implantable-tibial-nerve-stimulation-added-as-treatment-option-within-aua-sufu-2024-oab-guideline/

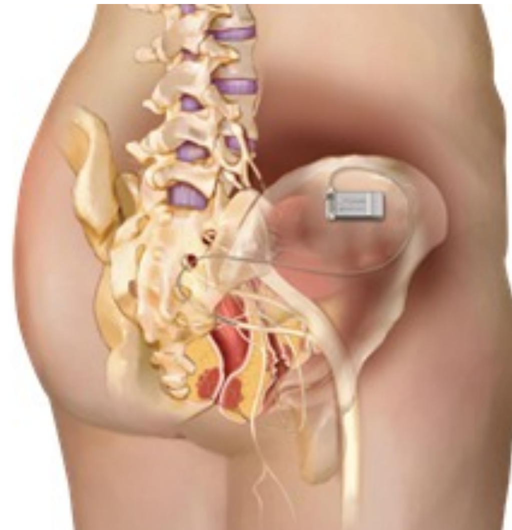
BOTOX

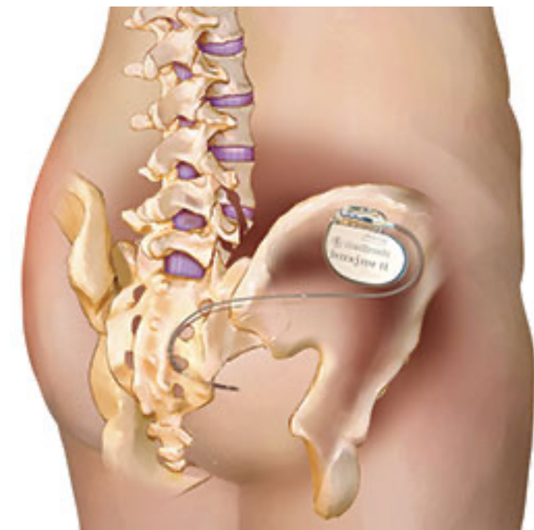
- Botulinum toxin
  - Consider if failed pharmacologic therapy
  - Botox administered under local anesthesia
  - Results are seen within 2 weeks and last for 3-12 months
  - Can cause increased risk of UTIs
  - AUA guidelines 2019
    - Pt must be able to do SIC if needed



Sacral Neuromodulator

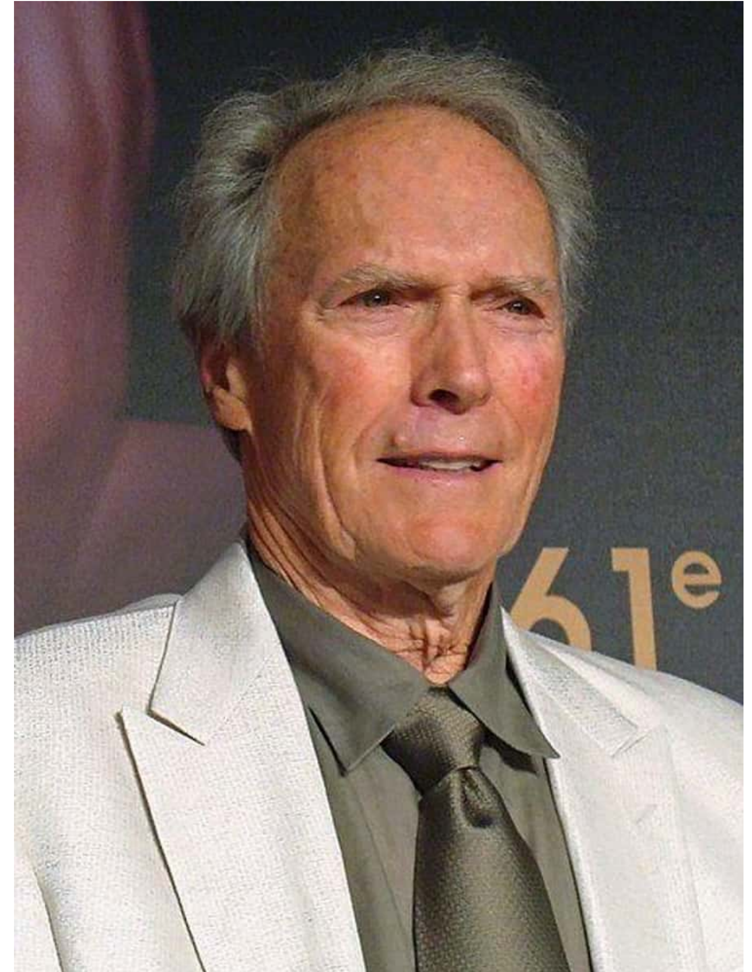
- Sacral Neuromodulation (SNS)
  - FDA approval 1997
  - Min. invasive surgical electrical stimulation
  - InterStim / Axonics
  - Patients must be able to learn to adjust the setting with a small device
  - Wire is placed into S3 foreman and connected to stimulation device
    - Two phase procedure
      - Test phase – need to see > 50% improvement in S/sx
      - Second stage implantation phase





Case Study

- 83 yo male with hx of BPH and now with LUTS (lower urinary tract symptoms)
  - PMHx: HTN BMI 27
  - Workup / GU history
    - Urodynamic study showed bladder outlet obstruction
    - PVR 35 ml
    - Prostate US 55 cc
    - I-PSS score 25/35 Q 4
  - S/p TURP 12/2020- path benign
  - Cystoscopy – open channel, no evidence of bladder neck contracture
  - Diet – likes his bourbon each night
  - Admits to constipation



International Prostate Symptom Score

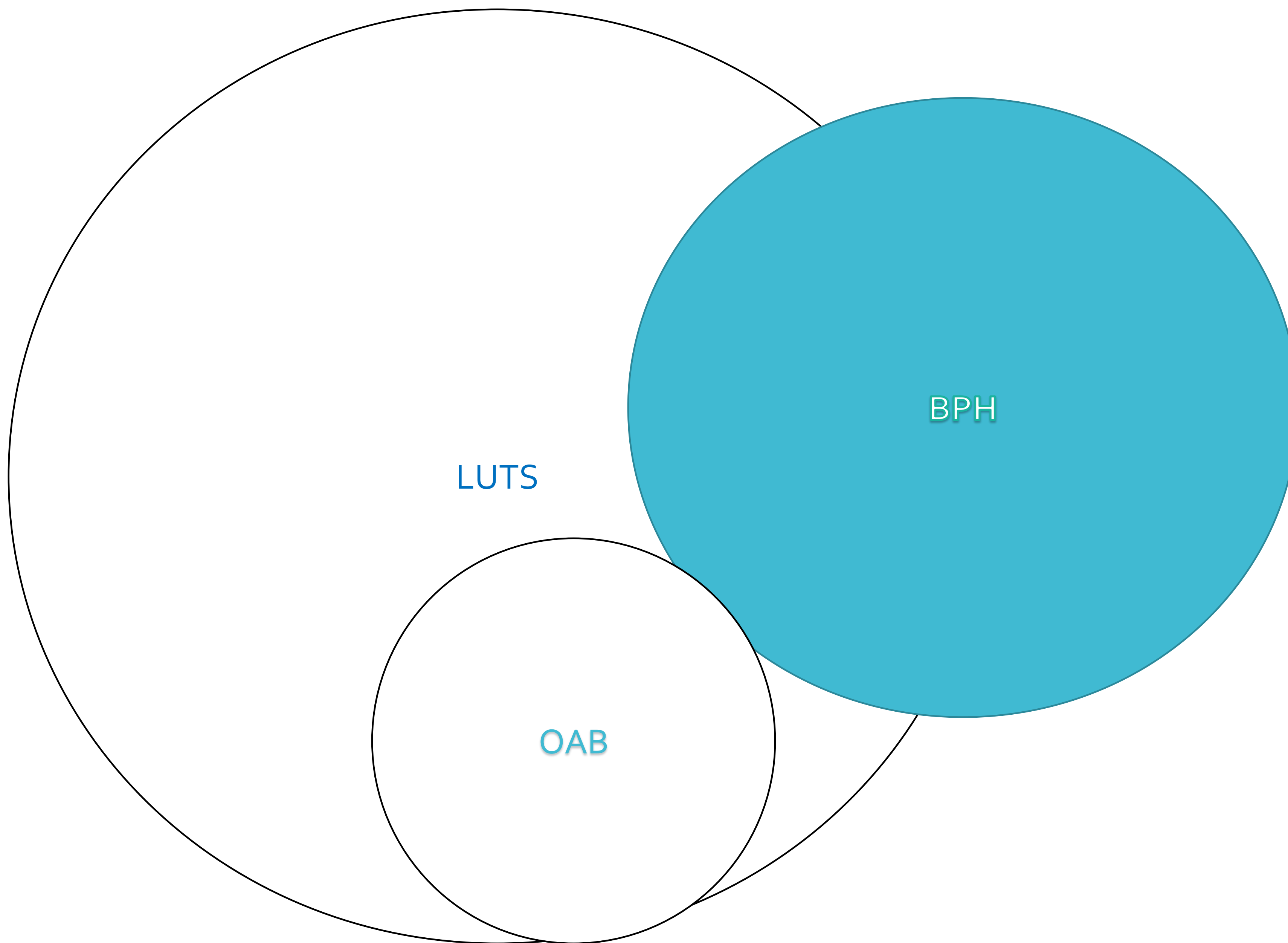
International Prostate Symptom Score (I-PSS)

Patient Name: ______________________ Date of birth: ________ Date completed ________

In the past month:	Not at All	Less than 1 in 5 Times	Less than Half the Time	About Half the Time	More than Half the Time	Almost Always	Your score
1. Incomplete Emptying How often have you had the sensation of not emptying your bladder?	0	1	2	3	4	5	
2. Frequency How often have you had to urinate less than every two hours?	0	1	2	3	4	5	
3. Intermittency How often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
4. Urgency How often have you found it difficult to postpone urination?	0	1	2	3	4	5	
5. Weak Stream How often have you had a weak urinary stream?	0	1	2	3	4	5	
6. Straining How often have you had to strain to start urination?	0	1	2	3	4	5	
	None	1 Time	2 Times	3 Times	4 Times	5 Times	
7. Nocturia How many times did you typically get up at night to urinate?	0	1	2	3	4	5	
Total I-PSS Score							

Score: 1-7: *Mild* 8-19: *Moderate* 20-35: *Severe*

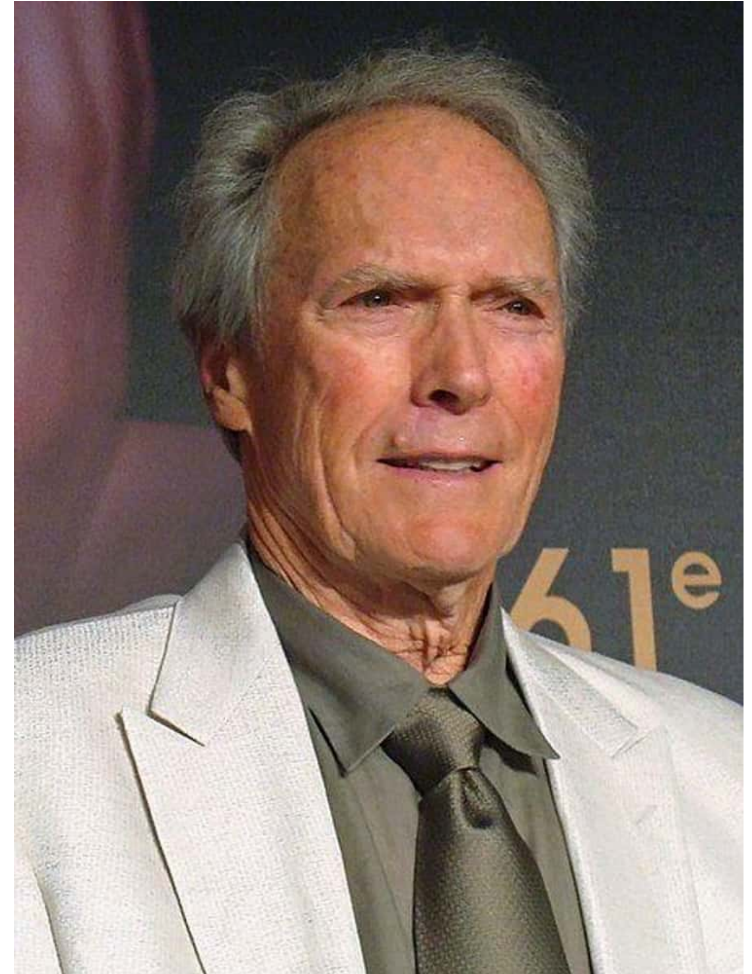
Quality of Life Due to Urinary Symptoms	Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible
If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that?	**0**	**1**	**2**	**3**	**4**	**5**	**6**


BPH
LUTS
OAB

Case Study

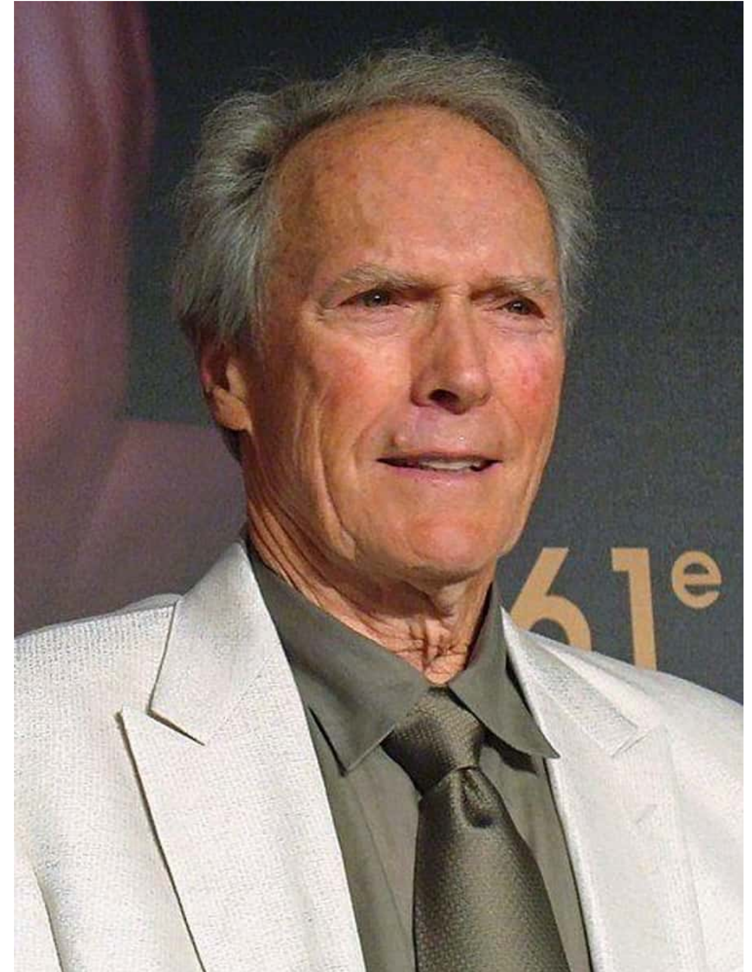
- Initially did very well with TURP for years but over the past 6-12 mo he has developed frequency / urgency and severe urge incontinence with some lack of sensory awareness
- 2-3 pads a day / accidents where he "doesn't make it to the bathroom in time"
- Effected his quality of life
- I-PSS 15/35 (urgency / frequency / nocturia)

- Treatment options



Case Study

- Behavioral Modifications
  - Healthy bladder diet
  - Bowel regimen
- Started on mirabegron 25 mg x 2 months, increased to 50 mg daily
  - No significant improvement
  - BP increased
- Discussed 3rd line therapies Botox / PTNS
- Elected to proceed with PTNS

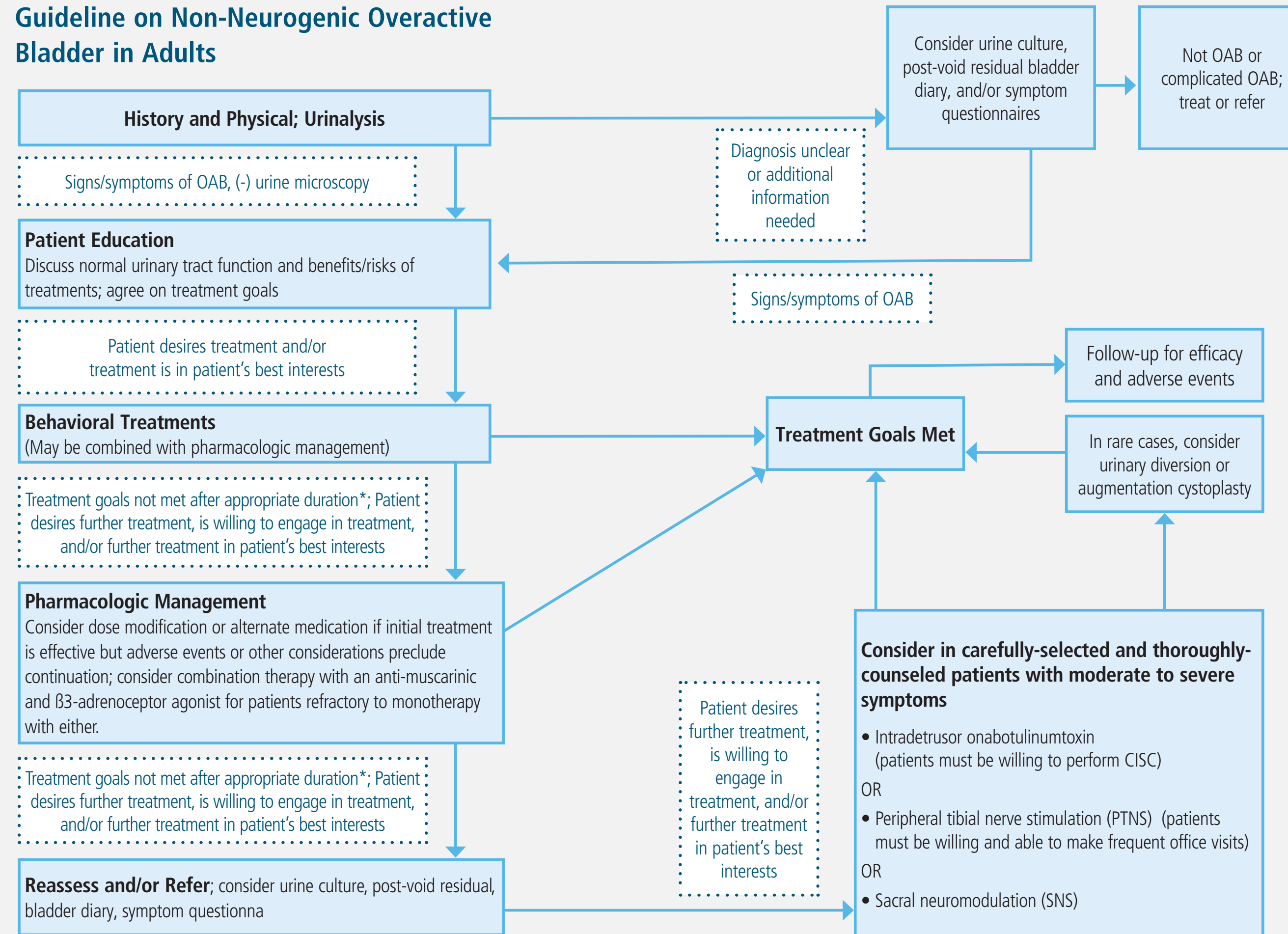


PTNS

- Prior to starting PTNS
  - Voids 5-6x a day
  - 3-4x nocturia
  - High Urgency
  - Severe urge urinary incontinence / 3 depends daily / daily accidents

- After completing 12 weekly sessions
  - Voids 4-5x a day
  - 1x nocturia
  - 1 depends a day, sometimes stays dry
  - Mild urgency

Patient agreed to have his picture taken for this presentation



AUA Guidelines OAB Adults 2019

Tips and Tricks

- Rule out infection / Stones as cause of LUTS
- Bladder training works – its free and NO side effects
- Nocturia
  - Causes: OAB / Obstructive Sleep apnea / excessive nighttime urine production
- Nocturnal Polyuria
  - Rule out Low nocturnal bladder capacity
- Good history / Voiding Diary is important
- What are your patients drinking on a daily basis
- In patients taking OAB meds, they may need good bowel regimen to prevent constipation
- Everyone should do kegels

Clinical Pearls

- When to refer to urology?
  - No response with 1st line therapy
  - Neurological disease
  - Hematuria / pelvic mass / underlying disease that could be contributing
  - Pelvic prolapse
  - Need for cystoscopy / urodynamic testing
- OAB is a clinical diagnosis
- Pelvic exam in important
- Role of estrace cream
- Treatment plans:
  - require shared decision making
  - step by step approach
  - individualized
- Screen for Dementia in OAB patients
- Indwelling catheters are NOT recommended as management for OAB
- Uncontrolled diabetes is a FACTOR with OAB

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Thank you