Adventures in UroGyne: Updates in Urinary Incontinence

39th Annual Contemporary Issues in Obstetrics and Gynecology
Sandestin, Florida
July 22, 2025

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THE UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

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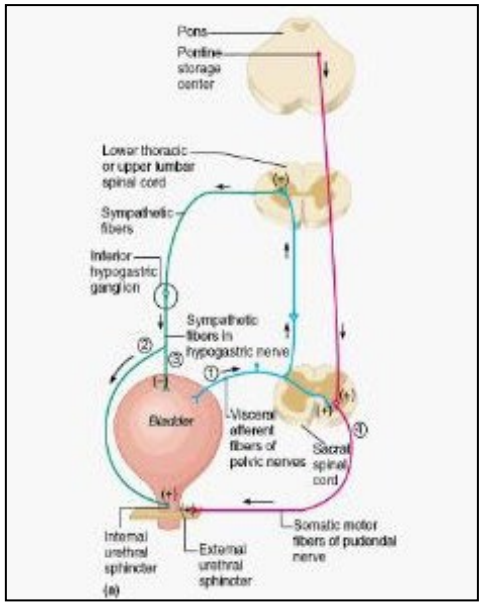
OBJECTIVES

1. Definition (SUI and OAB)
2. Etiology and Pathophysiology
3. Evaluation and Diagnosis
4. Treatment Options
    a. Conservative Management
        a. Pharmacologic Treatments
        b. Efficacy and side effects
    b. Surgical Therapies

Normal Micturition

- Continence
  - Intact micturition physiology and an intact functional ability to toilet oneself
- Sources of Control
  - Higher cortex of the brain, pons, spinal cord
  - Peripheral autonomic, somatic, sensory afferent innervation
  - Anatomical components of the lower urinary tract.
- Bladder is a “compliant balloon”
  - As it fills, the pressure remains lower than urethral resistance.
- Normal urination
  - Urethral resistance decreases and a phasic contraction of the detrusor muscle empties the bladder



Urinary Incontinence

The 3 Incontinence Questions (3IQ) Assessment Tool

The 3IQ is a patient questionnaire that helps your doctor distinguish urgency incontinence from stress incontinence. It should take no more than a couple of minutes. Complete the quiz and bring it to your next appointment.

1. During the last 3 months, have you leaked urine (even a small amount)?
   ☐ Yes ☐ No (if this response is marked, the 3IQ test is complete)

2. During the last 3 months, did you leak urine (check all that apply):
   ☐ When you were performing some physical activity, such as coughing, sneezing, lifting, or exercising?
   ☐ When you had the urge or the feeling that you needed to empty your bladder, but you could not get to the toilet fast enough?
   ☐ Without physical activity and without sense of urgency?

3. During the last 3 months, did you leak urine most often (check only one):
   ☐ When you were performing some physical activity, such as coughing, sneezing, lifting, or exercising?
   ☐ When you had the urge or the feeling that you needed to empty your bladder, but you could not get to the toilet fast enough?
   ☐ Without physical activity and without a sense of urgency?
   ☐ About equally as often with physical activity as with a sense of urgency?

Definitions of type of urinary incontinence are based on responses to question 3.

Response to Question 3	Type of Incontinence
Most often with physical activity	Stress only or stress predominant
Most often with the urge to empty the bladder	Urgency only or urgency predominant
Without physical activity or sense of urgency	Other cause only or other cause predominant
About equally with physical activity and sense of urgency	Mixed

Rogers, R.G., 2008. Urinary stress incontinence in women. New England Journal of Medicine, 358(10), pp.1029-1036.

Differential Diagnosis - Urinary Incontinence

Genitourinary etiology

- Filling and storage disorders
  - Urodynamic stress incontinence
  - Detrusor overactivity (idiopathic)
  - Detrusor overactivity (neurogenic)
  - Mixed types
- Fistula
  - Vesical
  - Ureteral
  - Urethral
- Congenital
  - Ectopic ureter
  - (Epispadias)

Non-genitourinary etiology

- Functional
  - Neurologic
  - Cognitive
  - Psychologic
  - Physical impairment
- Environmental
  - Behavioral
- Pharmacologic
- Metabolic

Risk Factors

- Age
- White
- Post-menopausal status
- Obesity
- Smoking
- Medical comorbidities
  - Diabetes
  - Sleep apnea
- Cognitive impairment
- Nerve damage
  - Spinal cord injury
  - Cerebrovascular accident
  - Multiple sclerosis

Forde et al. Urogynecological conditions associated with overactive bladder symptoms in women. Can Urol Associ J. 2017;11(3-4):E83-87
DuBeau CE. Interpreting the effect of common medical conditions on voiding dysfunction in the elderly. Urol Clin North Am. Feb 1996;23(1):11-8.

Factors to consider and rule out

- Infection / Inflammation
  - Recurrent Urinary Tract Infection
  - "Interstitial Cystitis" / Painful Bladder Syndrome
- Bladder outlet obstruction
  - Urethral Stricture
- Bladder pathology
  - Bladder cancer
  - Bladder stones
- Behavior / Iatrogenic
  - Diuresis due to excessive fluid intake
  - Impaired urine concentration
  - Medications

Radomski SB, Barkin J. Medical management of overactive bladder. Can J Urol. 2012;19 Suppl 1:2–9

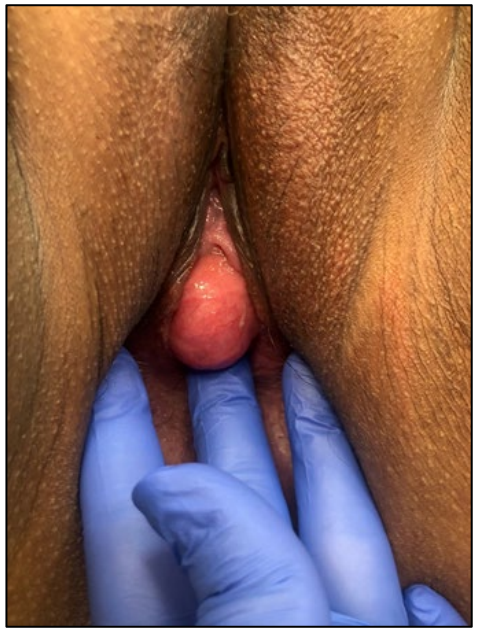
Other Considerations

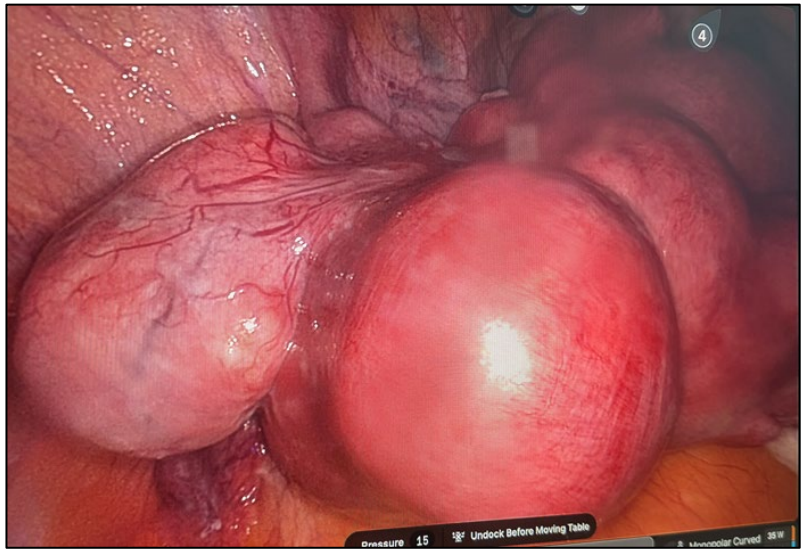
Medications that affect lower urinary tract (LUT) function	
Type of Medication	LUT Effects
Diuretics	Polyuria, frequency, urgency
Caffeine	Frequency, urgency
Alcohol	Sedation, impaired mobility, diuresis
Narcotic analgesics	Urinary retention, fecal impaction, sedation, delirium
Anticholinergic agents	Urinary retention, voiding difficulty
Antihistamines	Anticholinergic actions, sedation
Psychotropic agents Antidepressants Antipsychotics Sedatives and hypnotics	 Anticholinergic actions, sedation Anticholinergic actions, sedation Sedation, muscle relaxation, confusion
Alpha-adrenergic blockers	Stress incontinence
Alpha-adrenergic agonists	Urinary retention, voiding difficulty
Calcium-channel blockers	Urinary retention, voiding difficulty

Modified from Parsons M, Cardozo L. Female urinary incontinence in practice. London: The Royal Society of Medicine Press; 2004. p. 36
http://www.rsmpress.co.uk/bkparsons.htm

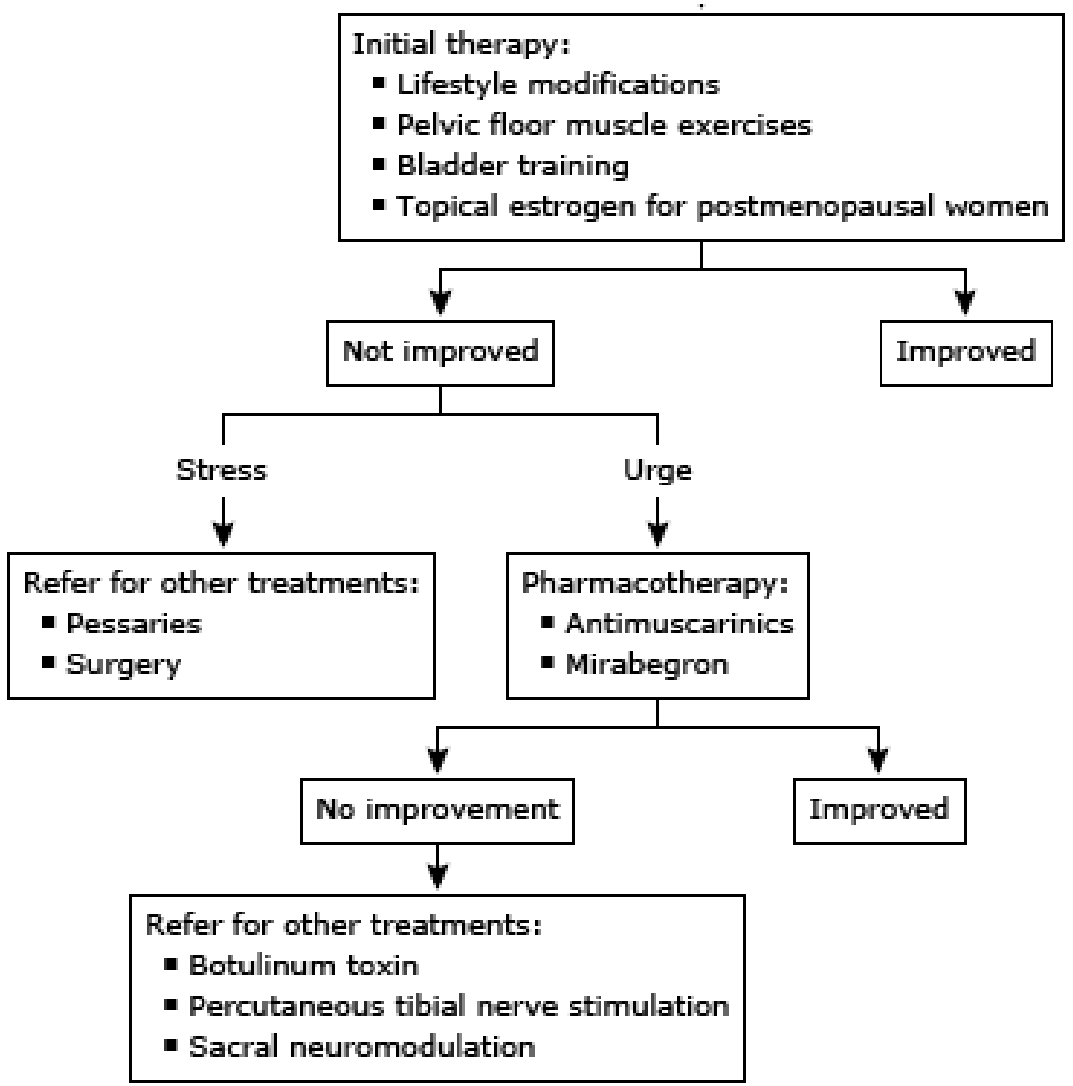
History & Physical

- Check Urine Dipstick (or UA with UCx)
  - rule out infection
- Uroflow and Post void residual
  - rule out obstructive voiding, retention
- Abdominal and Pelvic exam
  - fibroids
  - urethral diverticulum
  - HSV
  - cough stress test
  - urethral hypermobility
  - prolapse
- Neurologic exam – S2, S3, S4
- Cystoscopy
  - lesions, stones
- BLADDER DIARY





Treatment Algorithm



Stress Urinary Incontinence Definition

- Involuntary, sudden loss of urine secondary to increased intraabdominal pressure that is bothersome or affecting the patient's quality of life.
- Physical activities precipitating SUI include laughing, sneezing, straining, coughing, or exercising.

Committee Opinion No. 603: Evaluation of uncomplicated stress urinary incontinence in women before surgical treatment. Obstet Gynecol. 2014 Jun;123(6):1403-1407.

The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

AUGS
Advancing Female Pelvic Medicine and Reconstructive Surgery

PRACTICE BULLETIN

CLINICAL MANAGEMENT GUIDELINES FOR OBSTETRICIAN–GYNECOLOGISTS

NUMBER 155, NOVEMBER 2015
(Reaffirmed 2018)

(Replaces Practice Bulletin Number 63, June 2005)

Urinary Incontinence in Women

Urinary incontinence, the involuntary leakage of urine, is caused by a variety of factors and may result in a wide range of urinary symptoms that can affect women's physical, psychological, and social well-being and sometimes can impose significant lifestyle restrictions. Identifying the etiology of each woman's urinary incontinence symptoms and developing an individualized treatment plan is essential for improving her quality of life. The purpose of this joint document of the American College of Obstetricians and Gynecologists and the American Urogynecologic Society is to review information on the current understanding of urinary incontinence in women and to outline guidelines for diagnosis and management that are consistent with the best available scientific evidence.

Background

Urinary incontinence is a common condition in women. Approximately 25% of young women (1), 44–57% of middle-aged and postmenopausal women (2), and 75% of older women experience some involuntary urine loss (3, 4). The estimated direct cost of urinary incontinence care in the United States is $19.5 billion (5). Approximately 6% of nursing home admissions of older women can be

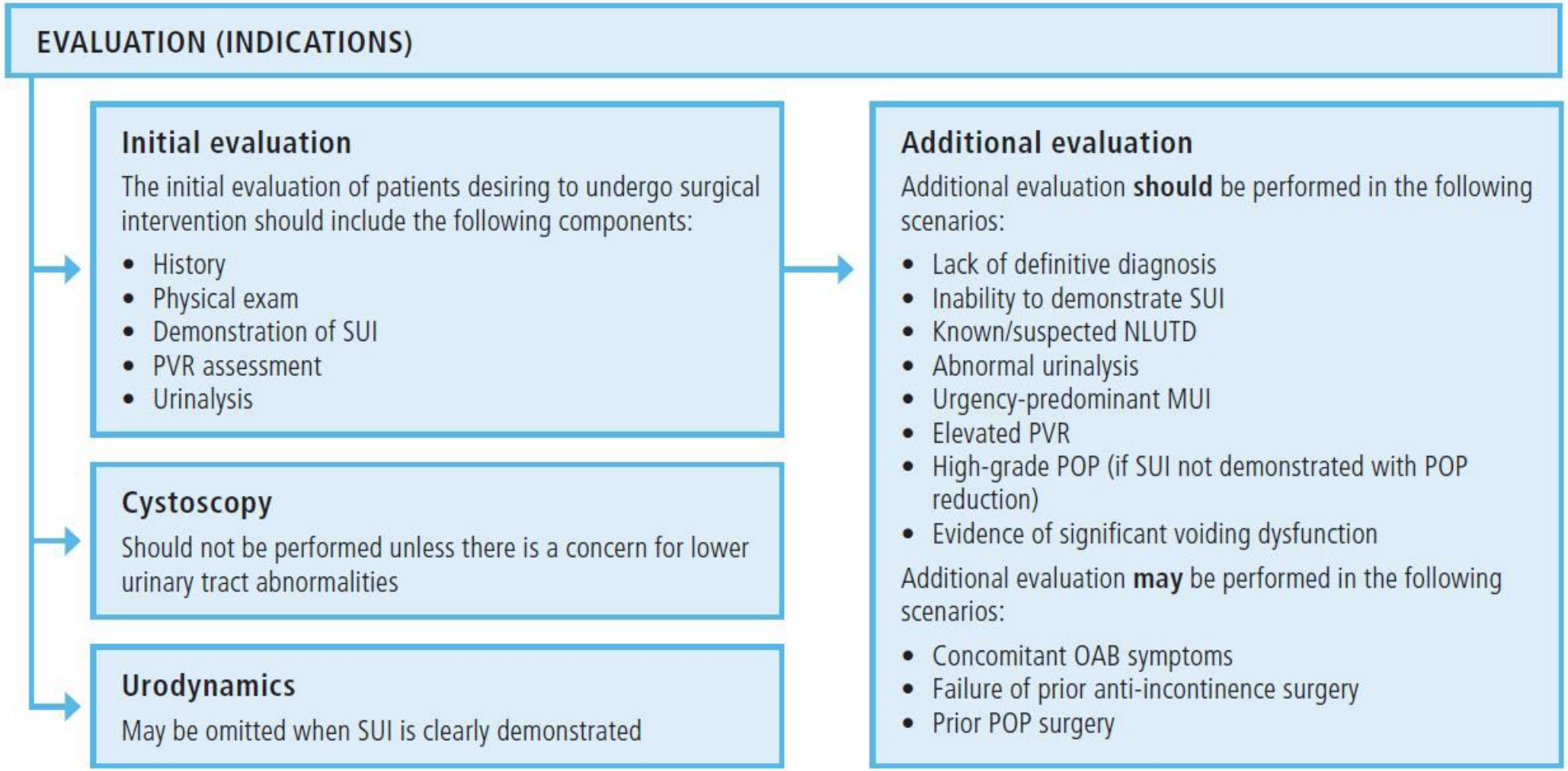
Etiology

Urinary incontinence can be caused by a variety of factors. The differential diagnosis includes genitourinary and nongenitourinary conditions (see Box 1). Some conditions that cause or contribute to urinary incontinence are potentially reversible.

Types

There are three main types of urinary incontinence in

Female Stress Urinary Incontinence: AUA/SUFU Evaluation and Treatment Algorithm



Stress Urinary Incontinence Guideline - American Urological Association

TREATMENT

Non-Surgical

- Continence pessary
- Vaginal inserts
- Pelvic floor muscle exercises

Surgical

- Bulking agents
- Midurethral sling (synthetic)
- Autologous fascia pubovaginal sling
- Burch colposuspension

If a midurethral sling surgery is selected, either the retropubic or transobturator midurethral sling may be offered. A single-incision sling may be offered to index patients if they are informed as to the immaturity of evidence regarding their efficacy and safety. Physicians must discuss the specific risks and benefits of mesh as well as alternatives to a mesh sling.

SPECIAL CASES

1. Fixed immobile urethra

- Pubovaginal sling
- Retropubic midurethral sling
- Urethral bulking agents

2. Concomitant surgery for POP repair and SUI

Any incontinence procedure

3. Concomitant NLUTD

Surgical treatment following appropriate evaluation and counseling

4. Child-bearing, diabetes, obesity, geriatric

Surgical treatment following appropriate evaluation and counseling

Stress Urinary Incontinence Guideline - American Urological Association

Treatment Options

- **Absorbent products**
- Artificial sphincter
- **Behavioral therapy***
  - education, fluid mgmt, bladder training
  - pelvic floor muscle training (+/- biofeedback)
- Bladder outlet reconstruction
- Closure of bladder outlet
- Continuous catheterization
- Electrical stimulation
- External collecting device
- **Intravaginal Supportive Device (pessary with knob)**
- Occlusive devices
  - Miniguard®
  - FemAssist®
  - CapSure™
  - FemSoft®
  - Revive®
  - Impressa®
- Urinary diversion

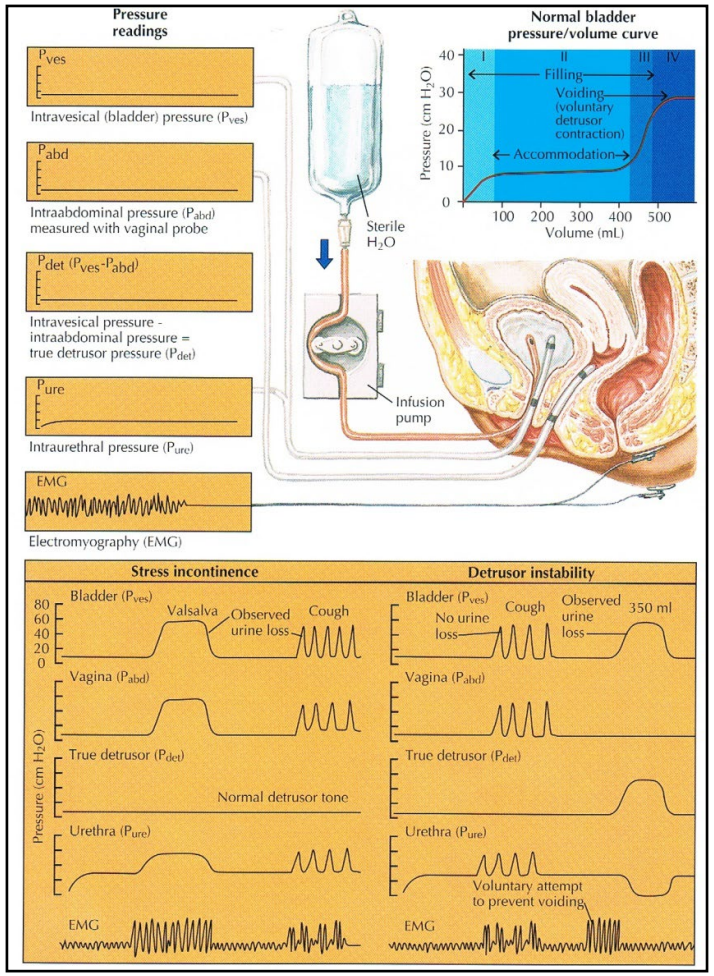
Surgery

- Colpourethropexy
- Needle Urethropexy
- Suburethral slings
- Peri-urethral bulking agents
- Mid-urethral Slings

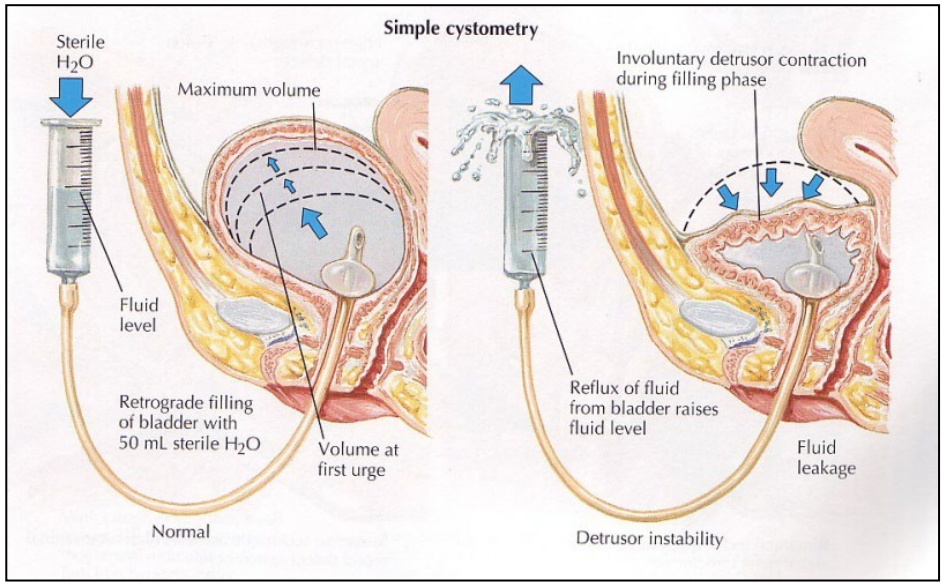
Pharmacologic therapy

- Estrogen
- α-Adrenergic agonists
- β-Adrenergic agonists
- β-Adrenergic antagonists
- SNRIs (serotonin-norepinephrine reuptake inhibitors)

Stress Urinary Incontinence



Simple Cystometrics



Netter diagrams

PESSARY

MILEX Products, Inc., Chicago, IL, USA

A. Ring
B. Shaatz
C. Gellhorn
D. Gellhorn
E. Ring with support
F. Gellhorn
G. Risser
H. Smith
I. Tandem cube
J. Cube
K. Hodge with knob
L. Hodge
M. Gehrung
N. Incontinence dish with support
O. Donut
P. Incontinence ring
Q. Hodge with support
R. Inflatoball (latex)

Surgical Treatments

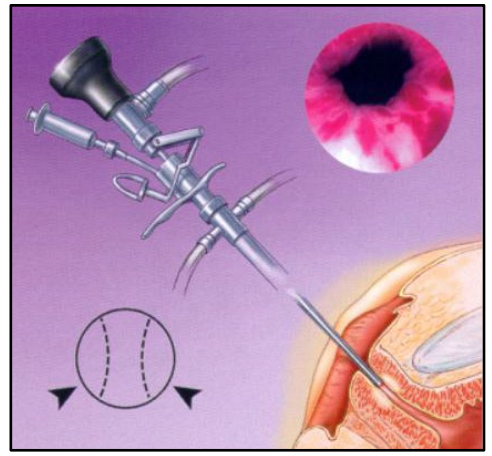
- (1907) Suburethal sling: Giordano described procedure in which gracilis muscle flaps were transplanted near the urethra
- (1914) Kelly plication
- (1917) Surgeons Goebell, Frankenheim, and Stoeckel developed a sling procedure using pyramidalis muscle w attached rectus fascia.
  - after the muscle bellies were dissected free to the level of the symphysis, the ends were passed behind the pubic bone and sutured below the urethra. The vesical neck was also plicated.
- (1930s) saw the decrease of musculofascial slings and the advent of slings composed only of fascia
- (1938) Periurethral bulking agents
- (1942) Aldridge dissected b/l strips of rectus fascia from the ant aspect of the muscle, leaving the medial portions attached to the muscle
  - the strips of fascia were then tunneled through the muscle, passed behind the symphysis, and sutured below the urethra. Ensuing years have brought the use of synthetic materials for slings and the use of suture bridges and patch slings
- (1949) Marshall-Marchetti-Krantz procedure
- Needle Urethropexy
  - Pereyra (1959), Stamey (1973), Raz (1981), Gittes (1987), Bone anchor needle suspension (1988)
- (1961) Burch Colposuspension
- (1972) Artificial sphincter
- (1996) Mid-urethral Sling

Howard Kelly operating with his surgical staff, 1916.

Treatment Options to date

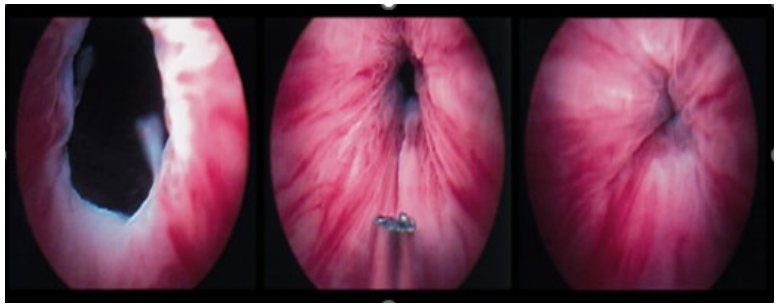
- Kelly Plication (1914)
- Peri-urethral bulking agents (1938)
- MMK: Marshall-Marchetti-Krantz procedure (1949)
- Burch Colposuspension (1961)
- Sub-Urethral Slings (1907)
  - Autologous Fascial Sling (Rectus, Fascia Lata), 1907 von Giordano
  - Needle Urethropexy
    - Pereyra (1959), Stamey (1973), Raz (1981), Gittes (1987), Bone anchor needle suspension (1988)
- Mid-urethral Sling – Drs. Ulmsten and Petros (1996)

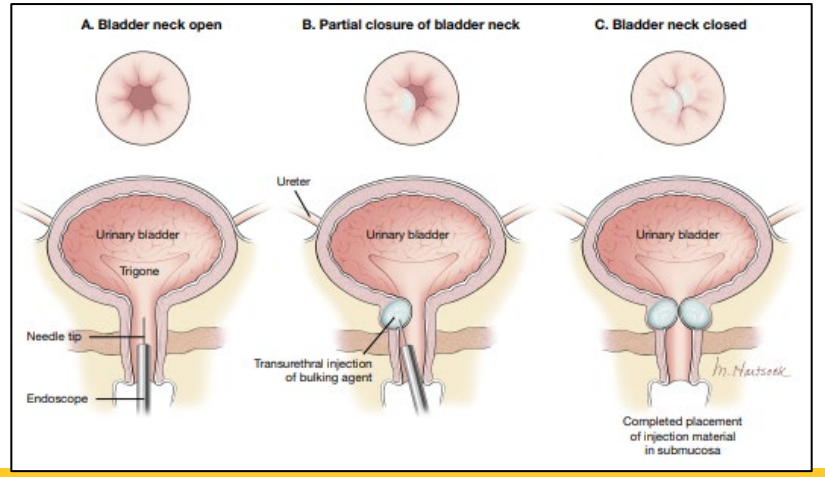
Bulking Agents



Periurethral bulking agents

- 1938, Murless (sclerosing agent)
- 1970's, Teflon
- Autologous fat
- 1989, first reported use of GAX-collagen (Glutaraldehyde cross-linked)
- 1993, FDA approves GAX-collagen for incontinence
- Durasphere®
  - Pyrolytic carbon-coated beads
- Coaptite®
  - Calcium hydroxyapatite particles
- Macroplastique®
  - Cross-linked polydimethysiloxane
- Bulkamid®
  - Polyacrylamid hydrogel





Marshall-Marchetti-Krantz & Burch

- 1949: MMK – a single suture (No. 1 chromic) placed on both sides of the urethrovesical junction
  - Each suture is then fixed to the periosteum or fibrocartilage of the pubic bone in such a way that the vesical neck is barely brought in contact with the pubic symphysis.

- 1962: 'Burch' was a modification due to difficulty in finding adequate periosteum in an elderly patient for MMK
  - Coopers ligament
    - Modification to LSC and RA procedures

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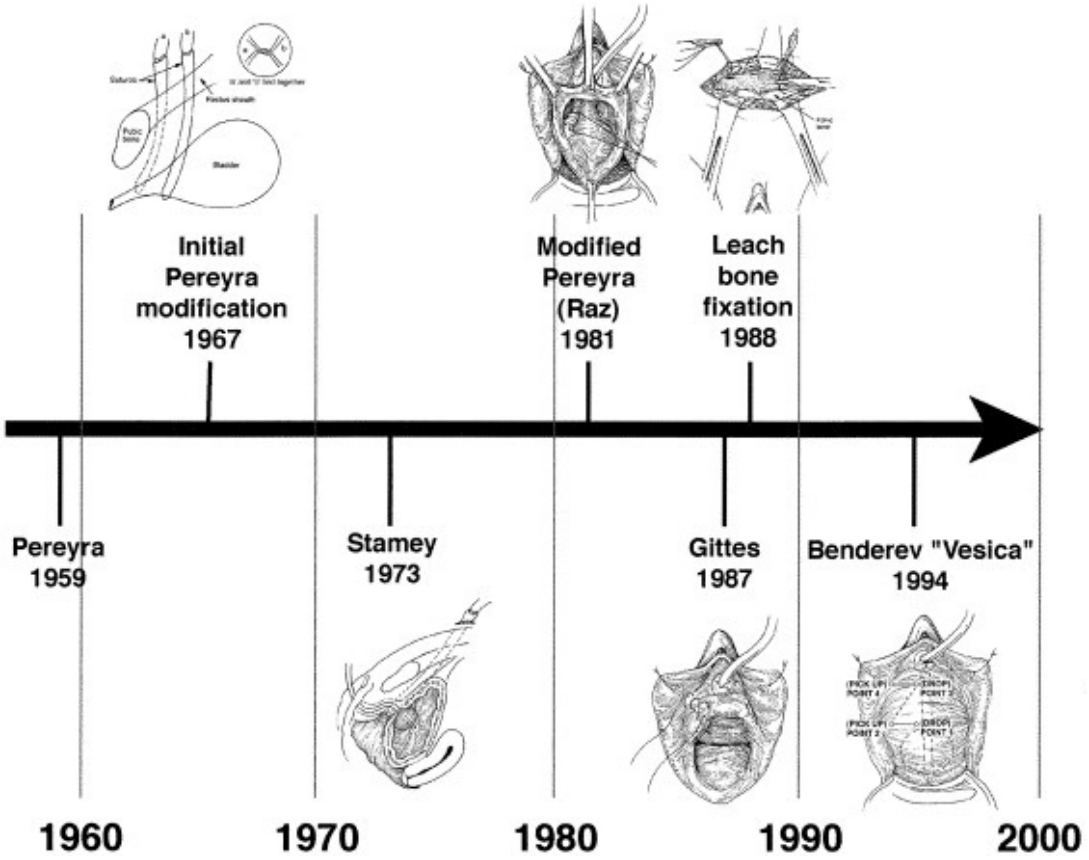
Needle Urethropexy



- Pereyra (1959)
- Stamey (1973)
- Raz (1981) "modified Pereyra"
- Gittes (1987)
- Bone anchor needle suspension (1988)

REVIEW ARTICLE| VOLUME 29, ISSUE 3, P575-584, AUGUST 01, 2002
Needle suspension procedures for female incontinence. Dawn Bodell, DO, Gary Leach, MD
DOI:https://doi.org/10.1016/S0094-0143(02)00073-3

Midurethral Sling – Gold Standard

- 1990: Ulmsten and Petros described the Integral Theory
- 1996: Ulmsten described the “TVT” retropubic operation

- 1999: Palma (preamble to ‘mini-sling’ using bovine)
- 2001: Delorme advanced modality to the transobturator tape

- 2006: TVT Secur (Gynecare)

  → Era of mini-slings?
- *2012: Postmarket surveillance studies*
- *Single incision slings*

Ulmsten U, Henriksson L, Johnson P, Varhos G. An ambulatory surgical procedure under local anesthesia for treatment of female urinary incontinence. Int Urogynecol J Pelvic Floor Dysfunct 1996;7:81-5

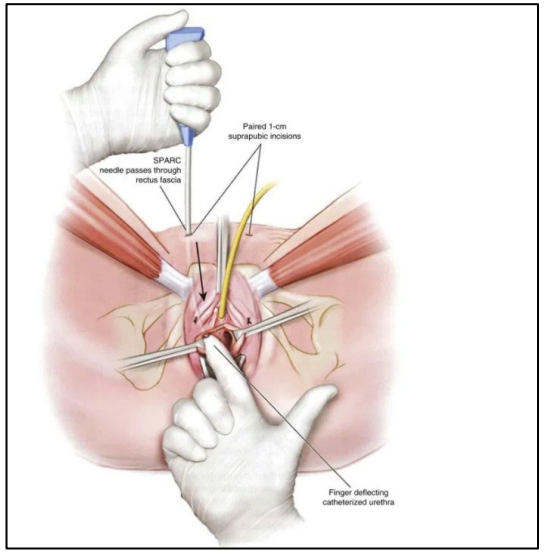
Delorme E. Transobturator urethral suspension: mini-invasive procedure in the treatment of stress urinary incontinence in women. Prog Urol 2001;11:1306-13

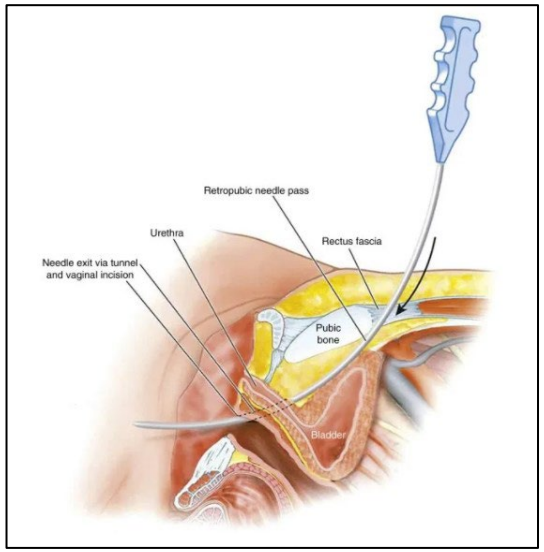
Naumann, G. (2012) Single-Incision Slings (SIS) - a New Option for the Surgical Treatment of Female Stress Urinary Incontinence. Geburtshilfe Frauenheilkd. [Online] 72 (2), 125–131

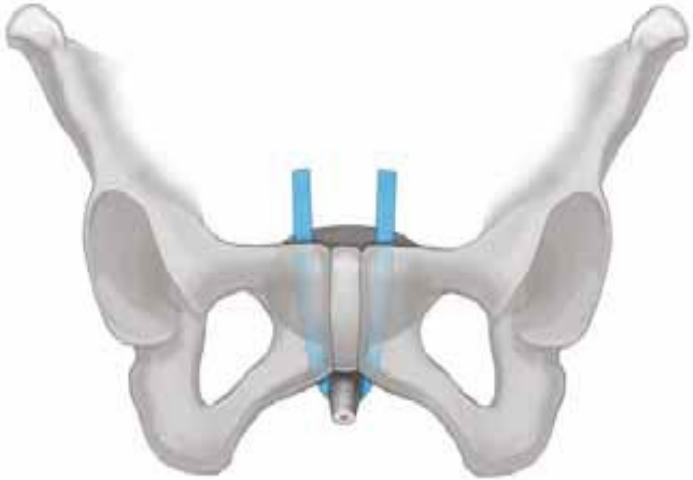
Preop Counseling

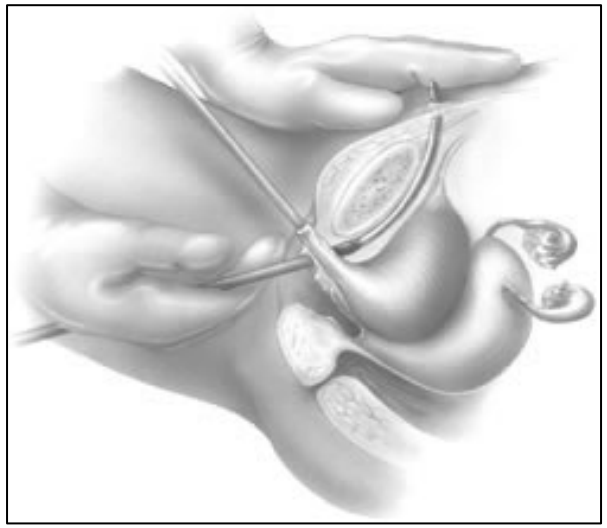
- Benefits – “cure rates”
  - Long term data

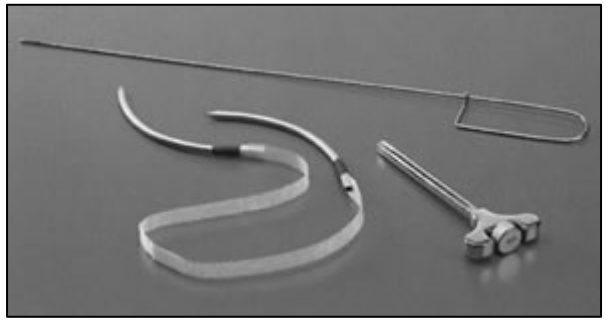
- AE’s:
  - Failure
  - Retention
  - Mesh erosion
  - Mesh exposure



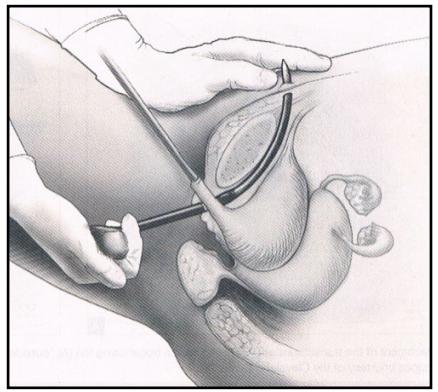


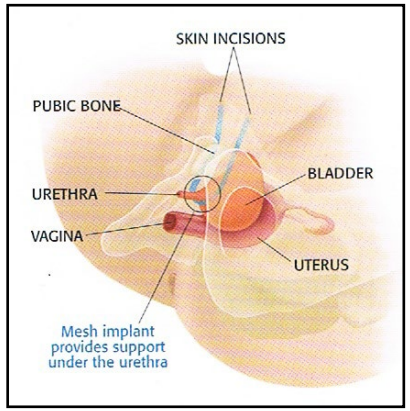


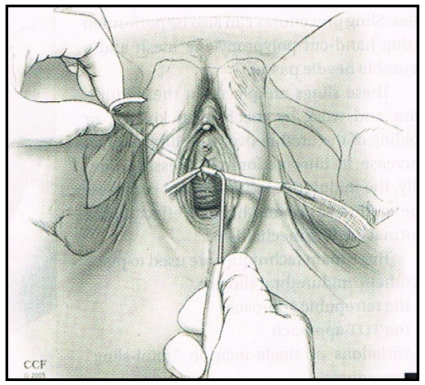


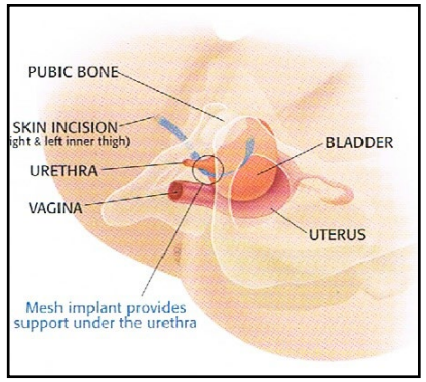


https://obgynkey.com/synthetic-midurethral-slings-for-stress-urinary-incontinence

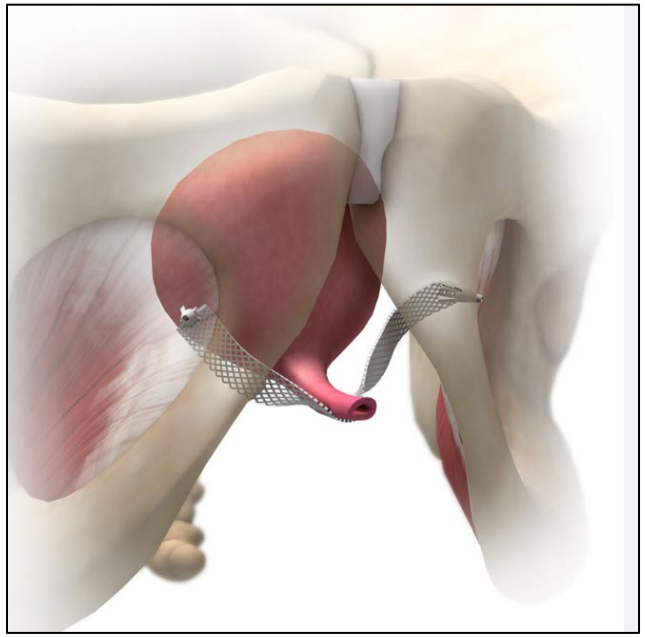


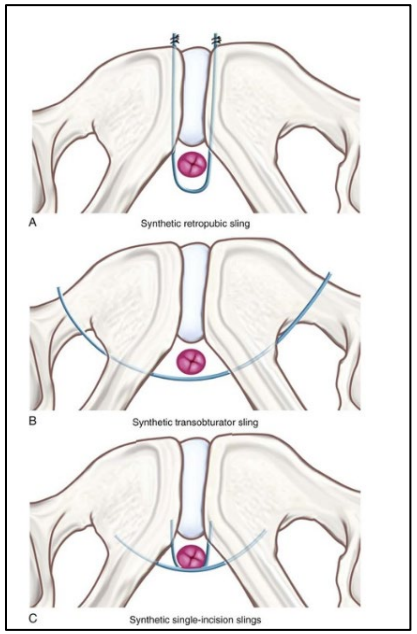






TOMUS Trial





Single-Incision Synthetic Midurethral Slings | Abdominal Key
Mallorie L. Hoover, DO, and Mickey Karram, MD. Urethral bulking agents for SUI: Rethinking their indications. OBG Management. October 2020. Vol. 32 No. 10

Dangerous territory

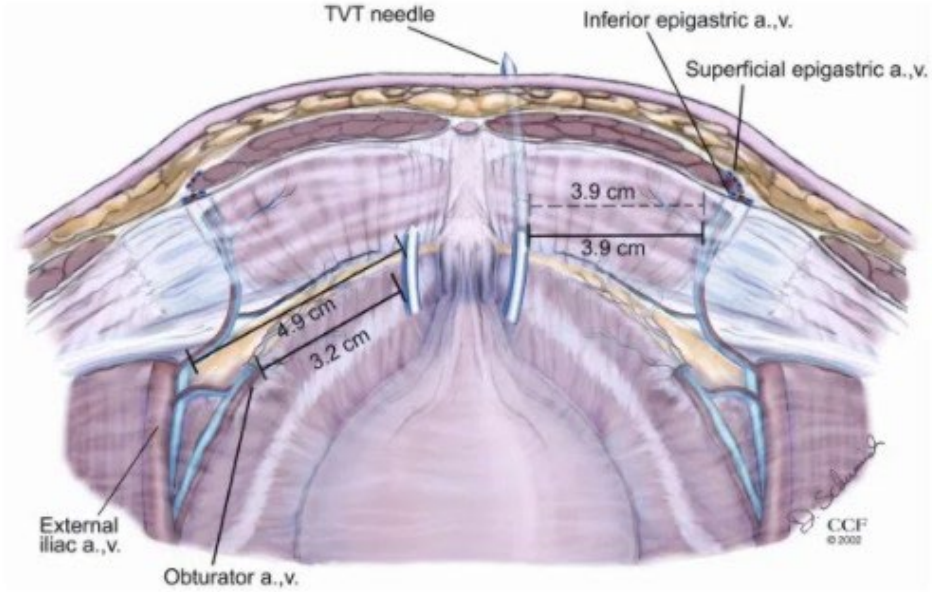
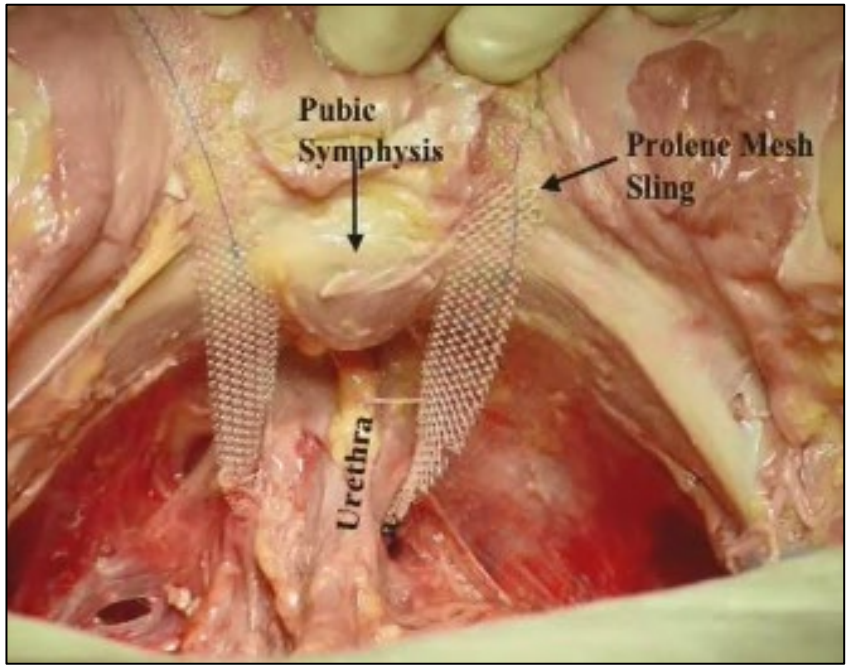
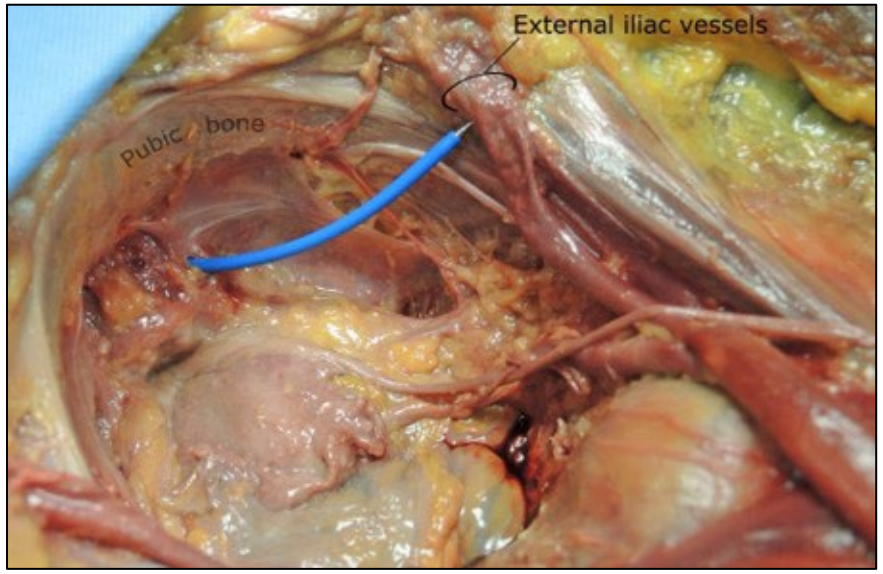


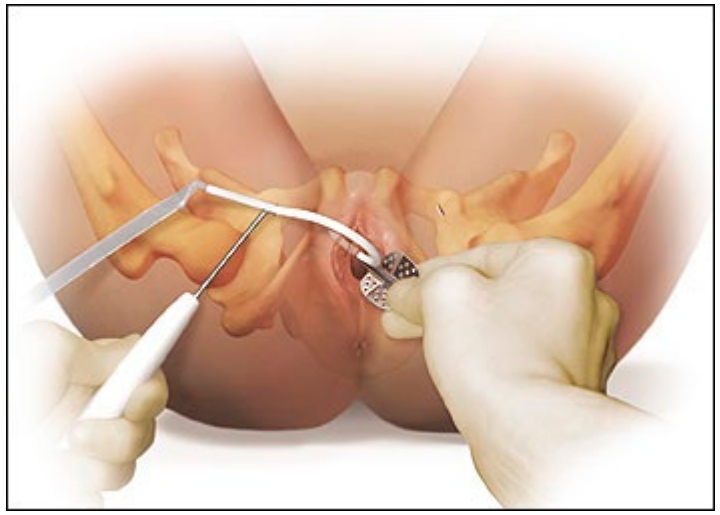
FIGURE 20.10
The relationship of the tension-free vaginal tape (TVT) needle to the vascular anatomy of the anterior abdominal wall and retropubic space. Numbers represent the mean distance from the lateral aspect of the TVT needle to the medial edge of the vessels. a, artery; v, vein.
(From Cleveland Clinic, with permission.)

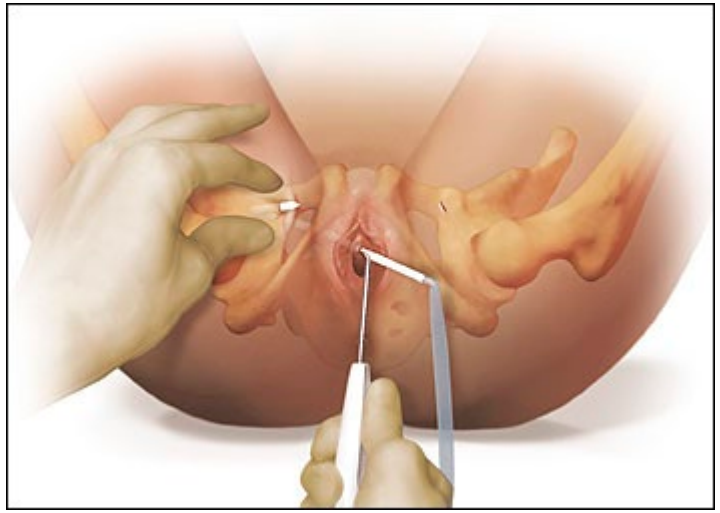


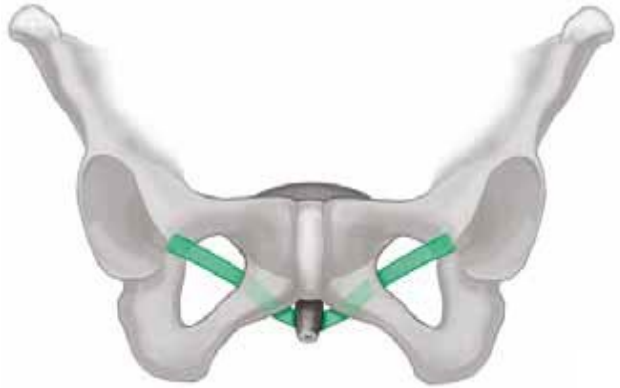


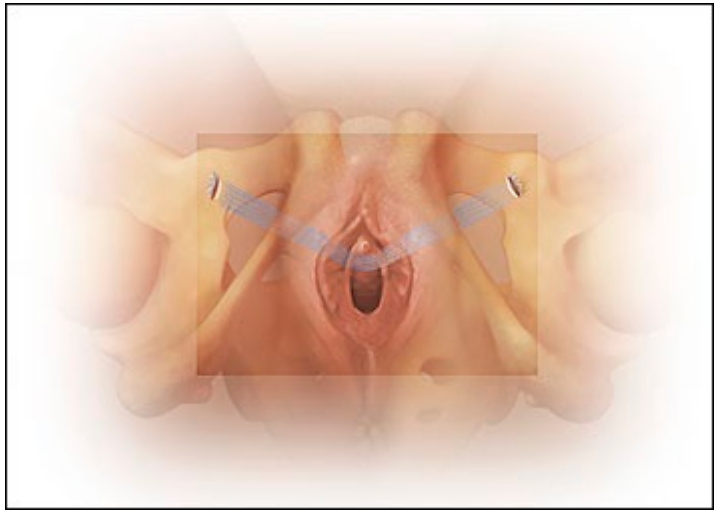
https://obgynkey.com/synthetic-midurethral-slings-for-stress-urinary-incontinence

Images from: Maria Florian-Rodriguez
Whiteside et al. CCF

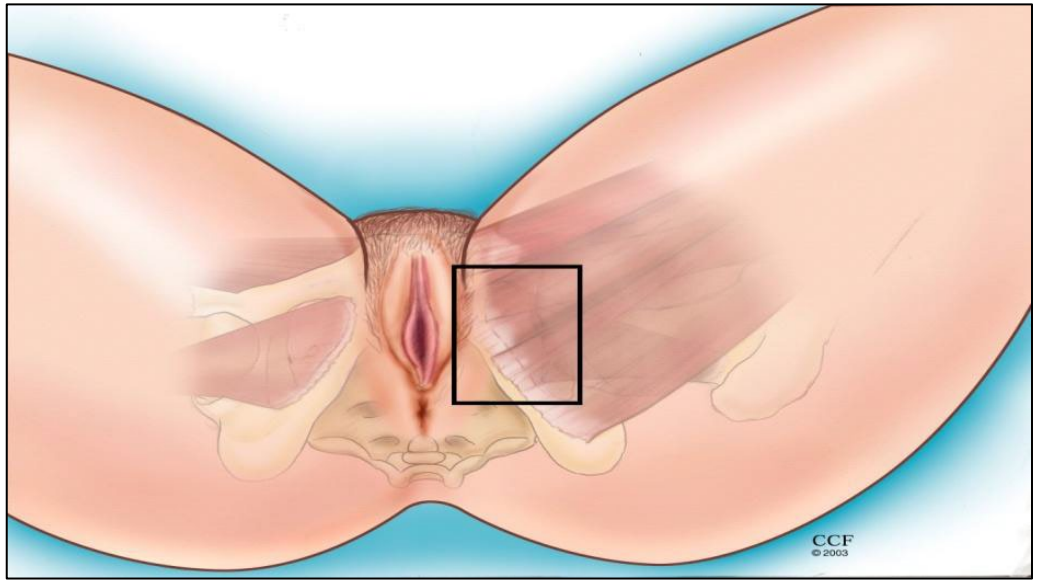


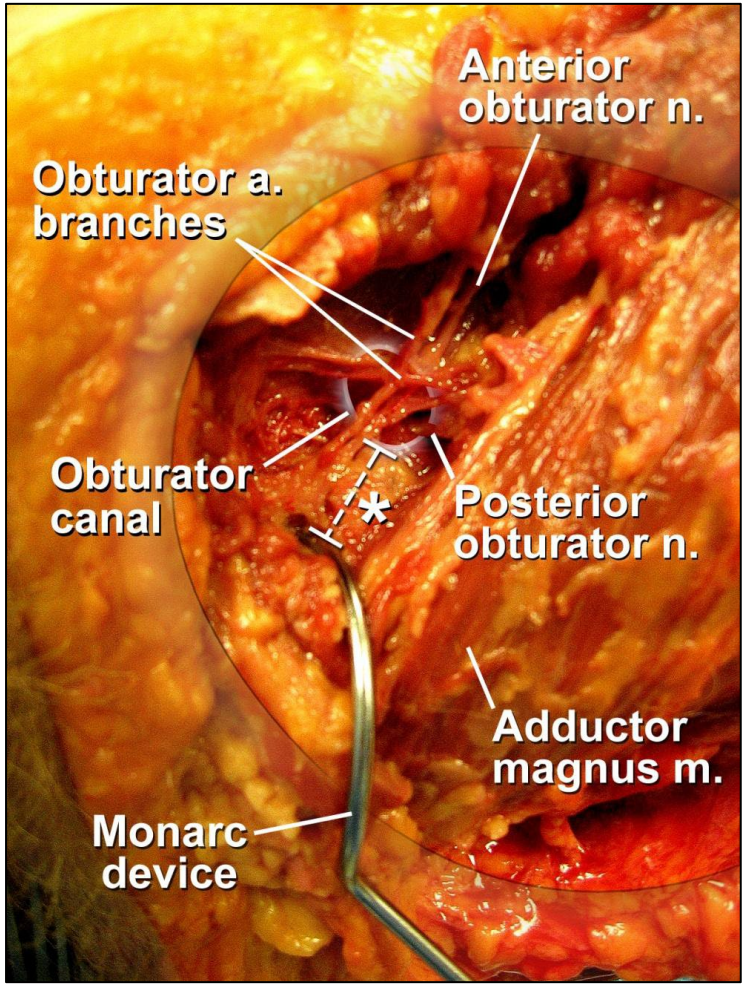






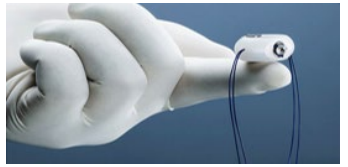
Stephanie Molden, MD, Vincent Lucente, Marisa Mastropietro
Institute of Female Pelvic Medicine & Reconstructive Surgery, Bethlehem, PA, USA

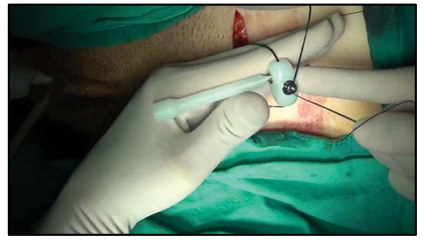

CCF
© 2003

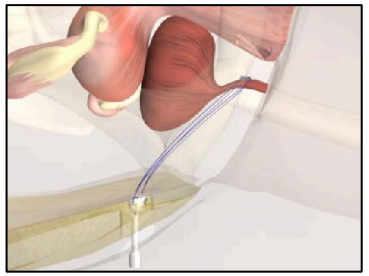

Anterior obturator n.
Obturator a. branches
Obturator canal
*
Posterior obturator n.
Adductor magnus m.
Monarc device

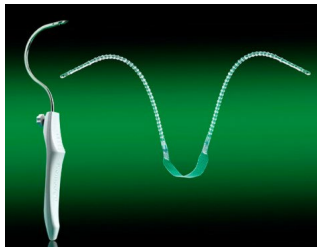
Single incision slings

Remeex (Regulation Mechanical External™)

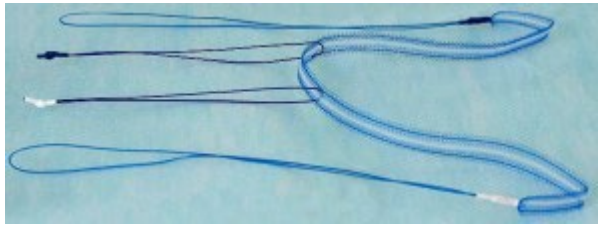






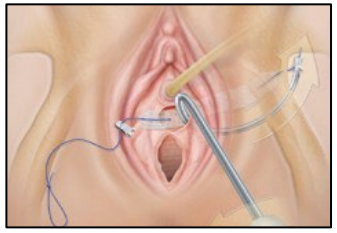


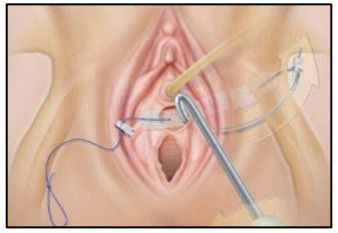
Safyre



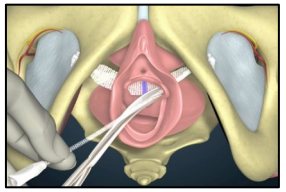
Transobturator adjustable tape

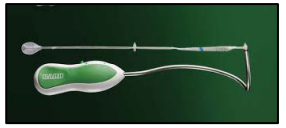
Solyx™
Single-Incision Sling System



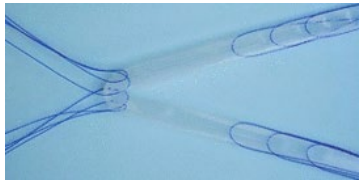


Altis®(Coloplast)





Adjust® (C.R. Bard)



Transvaginal adjustable tape

Adjustable Midurethral Slings in the Treatment of Female Stress Urinary Incontinence | IntechOpen. DOI: 10.5772/66856
Carlos, E. et al. 2010. Are-adjustable sling for female recurrent stress incontinence and sphincteric deficiency: Outcomes and complications in 125 patients using the Remeex sling system. Neurourology and urodynamics, 29(8), pp.1429-1432.

AUGS
Advancing Female Pelvic Medicine and Reconstructive Surgery

SUFU
Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction

Position Statement on Mesh Midurethral Slings for Stress Urinary Incontinence

The polypropylene mesh midurethral sling is the recognized worldwide standard of care for the surgical treatment of stress urinary incontinence. The procedure is safe, effective, and has improved the quality of life for millions of women.

Introduction

The purpose of this position statement by the American Urogynecologic Society (AUGS) and the Society of Urodynamics, Female Pelvic Medicine and Urogenital Reconstruction (SUFU) is to support the use of the midurethral sling in the surgical management of stress urinary incontinence, the type of urine leakage generally associated with coughing, laughing and sneezing.

Developed in the early 1990's, midurethral slings (MUS) treat stress urinary incontinence (SUI) in a minimally invasive, generally outpatient procedure. This technique utilizes a small mesh strip composed of monofilament polypropylene placed through the vagina under the mid-urethra exiting from 2 small sites in either the suprapubic or groin areas.

SUI is a highly prevalent condition of involuntary urine leakage resulting from faulty closure of the urethra typically associated with coughing, sneezing or exertion. SUI is often a debilitating and bothersome condition that can substantially reduce a woman's quality of life. Although non-surgical treatments such as pelvic floor exercises and behavioral modification are helpful in alleviating symptoms in some women [1], many proceed with surgery which is a more effective treatment [2].

In July 2011, the U.S. Food and Drug Administration (FDA) released a white paper [3] and safety communication [4] on the safety and effectiveness of transvaginal placement of surgical mesh specifically for pelvic organ prolapse. In addition, lawyers have publicly advertised their services, targeting women with transvaginal mesh placed for both pelvic organ prolapse and stress urinary incontinence (SUI), and the media has reported on the pelvic organ prolapse mesh litigation. We are concerned that the multimedia attention has resulted in confusion, fear, and an unbalanced negative perception regarding the midurethral sling as a treatment for SUI. This negative perception of the MUS is not shared by the medical community and the overwhelming majority of women who have been satisfied with their MUS. Furthermore, the FDA website states that: "The safety and effectiveness of multi-incision slings is well-established in clinical trials that followed patients for up to one-year."[5].

NHS inform

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Home > Tests and treatments > Non-surgical procedures

Transvaginal mesh implants

In recent years there has been some growing concerns about the use of transvaginal mesh implants, which are used for the treatment of pelvic organ prolapse (POP) or stress urinary incontinence (SUI).

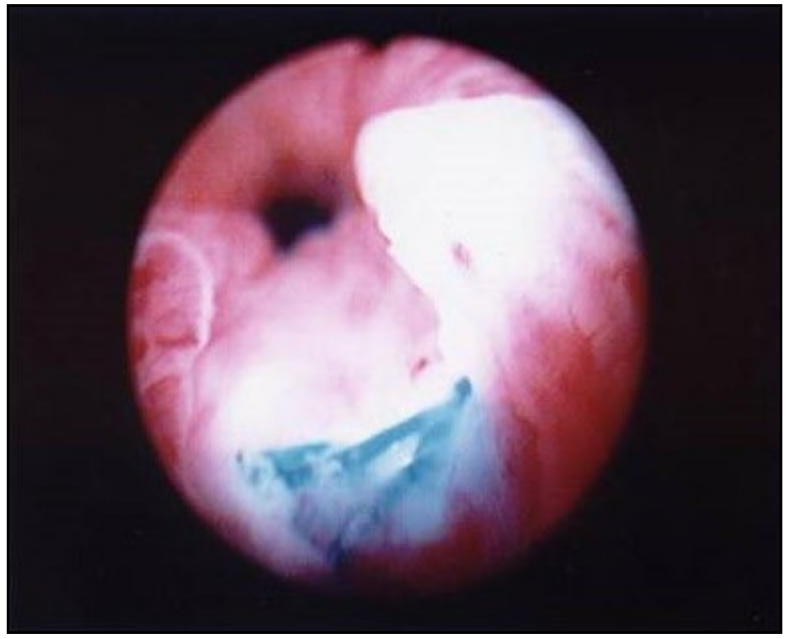
Following the public petition in Scottish Government about concerns raised with complications related to use of transvaginal mesh for both POP and SUI, the Scottish Government completed an independent review. This looked into the safety, use and efficacy (effectiveness) of transvaginal implants.

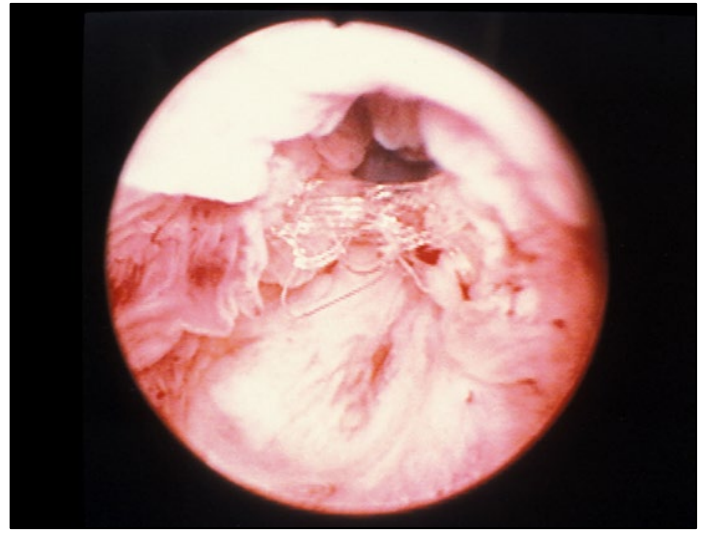
The report which was published in March 2017 made recommendations around managing patient who are considering surgery for SUi and POP and those suspected of having mesh related complications.

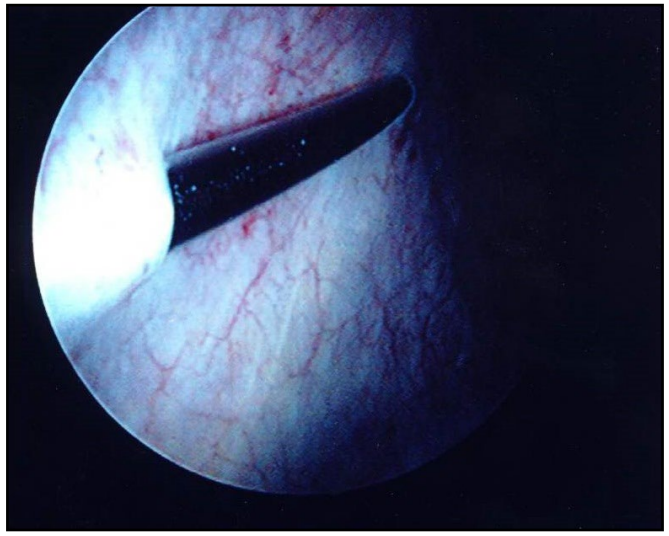
Some of the conclusions made by the independent review include:

- Shared decision making with health professionals and patient choice is essential when choosing treatments
- In the case of surgical treatment for stress urinary incontinence, individuals must be offered all appropriate treatments (mesh and non-mesh) as well as the information to make treatment option choices about their treatment
- In the surgical treatment of pelvic organ prolapse, current evidence does not show any extra benefit from the use of transvaginal implants (prolypropylene mesh or biological graft) over native tissue repair. Transvaginal mesh procedures must not be offered routinely

Complications



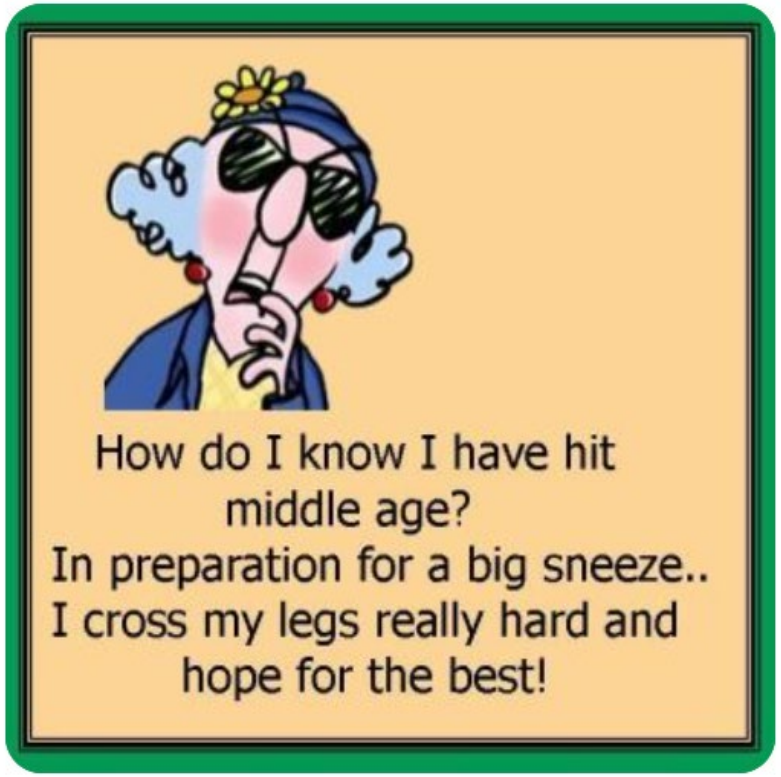




Images: Drs. Ferzandi and Kow

Take home points

- Bladder retraining
- Pelvic Floor Physical Therapy
- Pessary Devices
- Bulking Agents
- But….
  - The Gold Standard is MUS
  - Most studied device in medical literature



Definition – Overactive Bladder

- International Continence Society Definition
  - "Urinary urgency, usually accompanied by frequency and nocturia, with or without urgency urinary incontinence (UI), in the absence of urinary tract infection (UTI) or other obvious pathology."

- Urinary frequency
- Nocturia
- Urgency urinary incontinence

Hayden et al. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. Int Urogynecol J 2010;21:5-26
White, N., Iglesia, CB. Overactive bladder. Obstet Gynecol Clin N Am. 2016; 43(1):59-68
Wallace et al. Bladder training for urinary incontinence in adults. Cochrane Database Syst Rev 2004(1); CD001308

Symptoms / Complaints

- Diagnosis is made by clinical and subjective criteria

- Urinating eight or more times per day
- Waking up ≥ 1 time at night to urinate
- An overwhelming and sudden need to urinate, even if recently voided
  - “I don’t empty my bladder”
  - “I have urinary retention”
  - “Key in the door”
- Leakage of urine before she’s able to make it to a bathroom

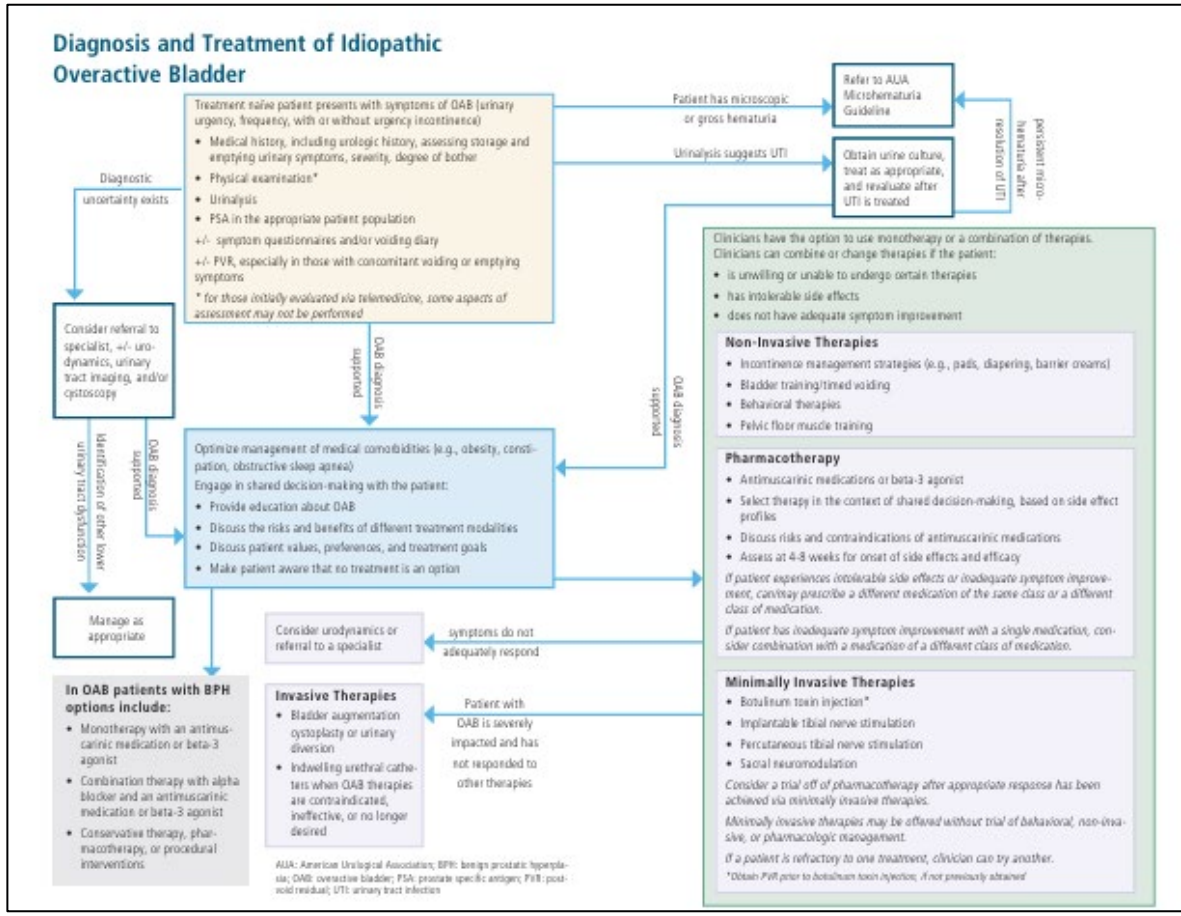
Overactive Bladder

- Bladder Diary
- UDS (?)

- First Tier
  - Bladder Retraining
    - timed voiding, fluid management
  - Caffeine and EtOH Reduction
  - Pelvic floor Physical Therapy (muscle relaxation)

- Second Tier
  - Medications (Anti-cholingerics, B3 agonists)

- Third Tier
  - Procedural



The AUA/SUFU Guideline on the Diagnosis and Treatment of Idiopathic Overactive Bladder - American Urological Association

American Urogynecologic Society

Patient Name:

Intake and Voiding Diary

This chart is a record of your fluid intake, voiding and urine leakage. Please bring this diary to your next visit.

Instructions:

1. Choose 4 days (entire 24 hours) to complete this record – they do not have to be in a row. Pick days in which will be convenient for you to measure every void.
2. Begin recording when you wake up in the morning–continue for a full 24 hours.
3. **Make a separate record for each time you void, leak, or have anything to drink.**
4. Measure voids (using cc measurements) using the hat.
5. Measure fluid intake in ounces.
6. When recording a leak – please indicate the volume using a scale of 1-3 *(1=drops/damp, 2=wet-soaked, 3=bladder emptied), your activity during the leak, and if you had an urge ("yes" or "no").

DAY 1	**Date:**				
Time	**Amount Voided** *(in ccs)*	**Leak Volume** *(scale of 1-3)*	**Activity during leak**	**Was there an urge**	**Fluid intake** *(Amount in ounces/type)*
Example					
7:15a	*325 cc*				
7:45a		*2*	*Watching TV*	*Yes*	
8:15a					*8 oz coffee, 8 oz orange juice*
10:30a		*1*	*Jogging*	*No*	

Plan / Process and Treatment

- Rule out UTI (UA, Ucx)
- Check Post-void residual
- Review Voiding diary (+/- Urodynamics)

- Timed Voiding & Fluid Management
  - Caffeine
  - EtOH

Pharmacotherapy

- Antimuscarinics
  - act on bladder M2/M3 receptors to inhibit involuntary detrusor contractions

- β-agonists
  - activates β-3 receptor in detrusor, causing detrusor relaxation and increased bladder capacity

Dosing of Rx

Drug	Brand Name	Dose	Frequency
Antimuscarinic – IR			
Oxybutynin IR	Ditropan	5mg	2-4x daily
Tolterodine IR	Detrol	1-2mg	bid
Trospium chloride	Sanctura	20mg	bid
Antimuscarinic - ER			
Darifenacin ER	Enablex	7.5mg, 15mg	daily
Fesoterodine ER	Toviaz	4mg, 8mg	daily
Oxybutynin ER	Ditropan XL	5mg – 30mg	daily
Oxybutynin TDS	Oxytrol	3.9mg = 1patch	twice weekly
Oxybutynin 10% gel	Gelnique	100mg = 1 g of gel	daily
Solifenacin	Vesicare	5mg, 10mg	daily
Tolterodine ER	Detrol LA	2-4mg	daily
Trospium chloride	Sanctura XR	60mg	daily
β-3 Agonist			
Mirabegron	Myrbetriq	25mg, 50mg	daily
Vibegron	Gemtesa	75mg	daily

Rosenberg et al. A practical primary care approach to overactive bladder. Can J Urol. 2014;21(Suppl 2):2-11

Pharmacotherapy – Side Effects

Anti-cholinergics

- Dry mouth
- Dry eyes
- Constipation
- Urinary retention
- GERD
- Blurry vision
- Cognitive side effects
- Contraindications: narrow angle glaucoma, gastroparesis, urinary retention

β3 Agonists

- High blood pressure*
- Contraindication: uncontrolled hypertension, ESRD, liver disease

- *Mirabegron

Chapple et al. Onset of action of the b3-adrenoceptor agonist, mirabegron, in Phase II and III clinical trials in patients with overactive bladder. World J Urol (2014) 32:1565–1572
Benner et al. Patient-reported reasons for discontinuing overactive bladder medication. 2009 BJU International 105, 1276–1282

Antimuscarinics

AUGS COMMUNICATION

AUGS Consensus Statement: Association of Anticholinergic Medication Use and Cognition in Women With Overactive Bladder

Author Information

Female Pelvic Medicine & Reconstructive Surgery 23(3):p 177-178, 5/6 2017. | *DOI:* 10.1097/SPV.0000000000000423

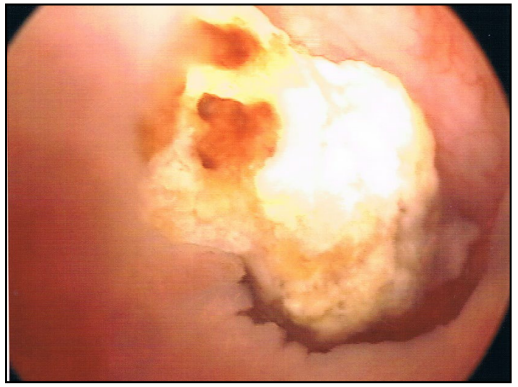
- AUGS STATEMENT ON USE OF ANTI-CHOLINERGICS and the ELDERLY
- Patient selection for pharmacotherapy
  - Assess cost, dosing frequency, drug-drug interactions, potential side effects, and comorbid conditions that may increase adverse drug effects
  - Head-to-head comparison trials consistently show that extended-release agents have lower rates of adverse effects than immediate release agents
- Clinical strategies
  - Decreasing the starting dose of all antimuscarinics is especially important in adults ≥60 years of age
  - Antimuscarinics can take up to four weeks to reach their full efficacy
    - Avoid escalating the dose or declaring treatment failure prematurely.
  - The quick onset of action of the immediate release preparations makes them useful when continence is desired at specific times
  - Patients who fail treatment with one antimuscarinic may respond to an alternate antimuscarinic

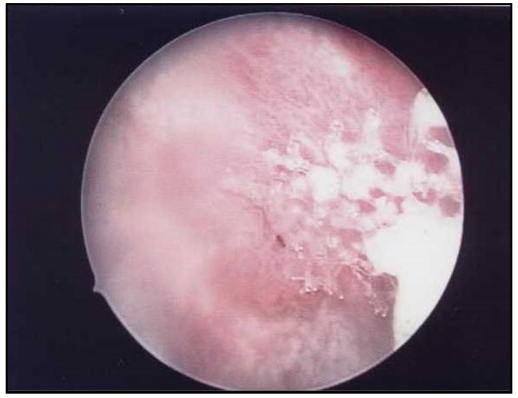
Jumadilova et al. Am J Health Syst Pharm. 2006;63(23):2357-2364
Rovner ES, Wein AJ. Eur Urol. 2002;41(1):6-14
Madhuvrata et al. Cochrane Database Syst Rev. 2012 Jan 18;1:CD005429

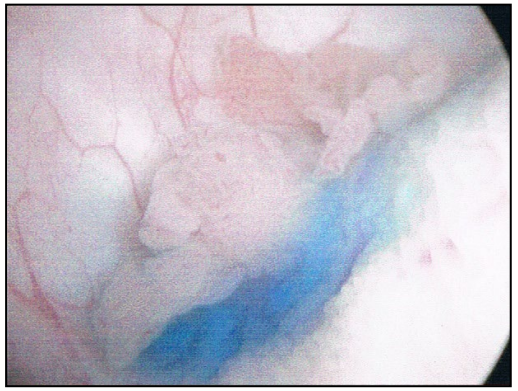
What next?

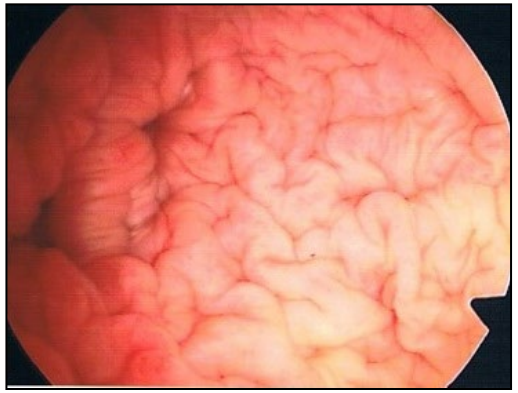
- Role of Pelvic Floor Physical Therapy
  - Say NO to Kegels!
- Revisit their voiding and fluid mgmt. and habits
- ? Cystoscopy
- Move your patients to the next tier

Cystoscopy







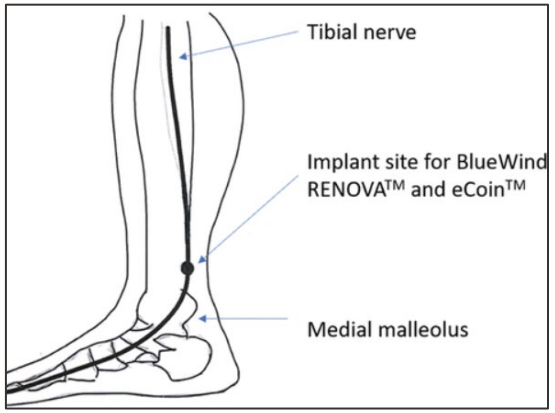


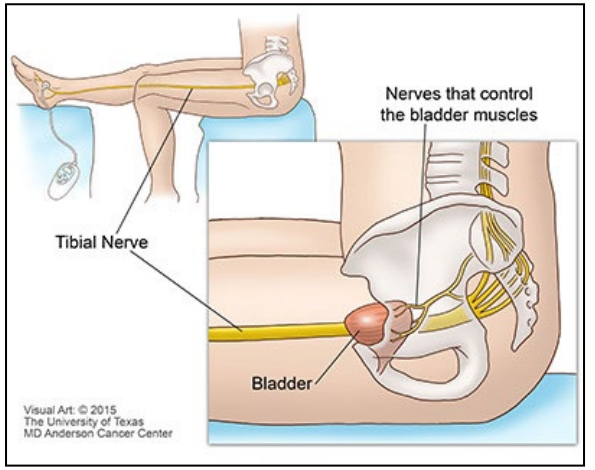
Posterior Tibial Nerve Stimulation

BlueWind MEDICAL

MEDTRONIC BLADDER CONTROL THERAPY DELIVERED BY THE NURO™ SYSTEM

VALENCIA TECHNOLOGIES



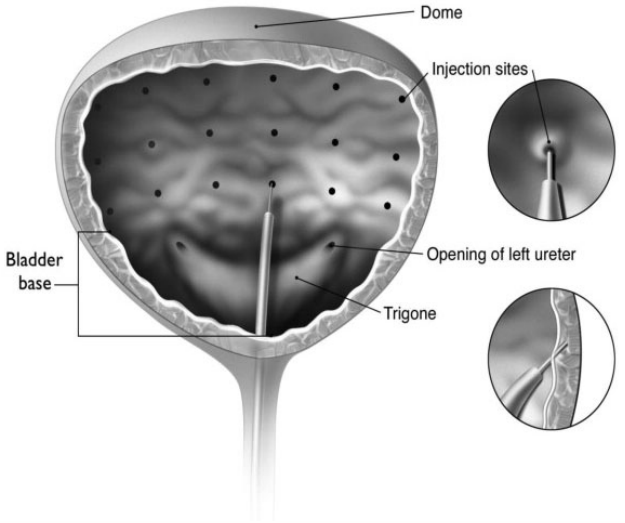


Percutaneous Tibial Nerve Stimulation

Intravesical Botox®

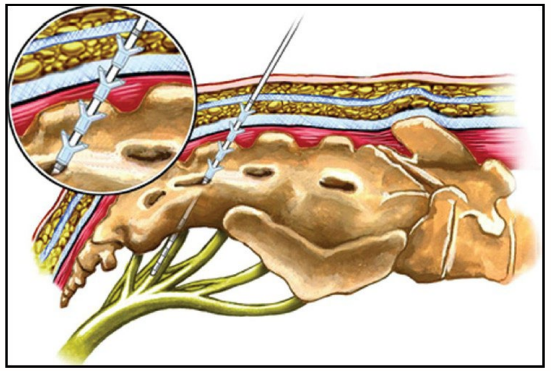
(onabotulinumtoxinA)

- Purified neurotoxin from Clostridium botulinum
- Blocks presynaptic release of acetylcholine at the neuromuscular junction resulting in permanent, flaccid paralysis
- Regrowth of new motor end plate units to reestablish the neuromuscular connection can take 3-24 months, at which point retreatment is required

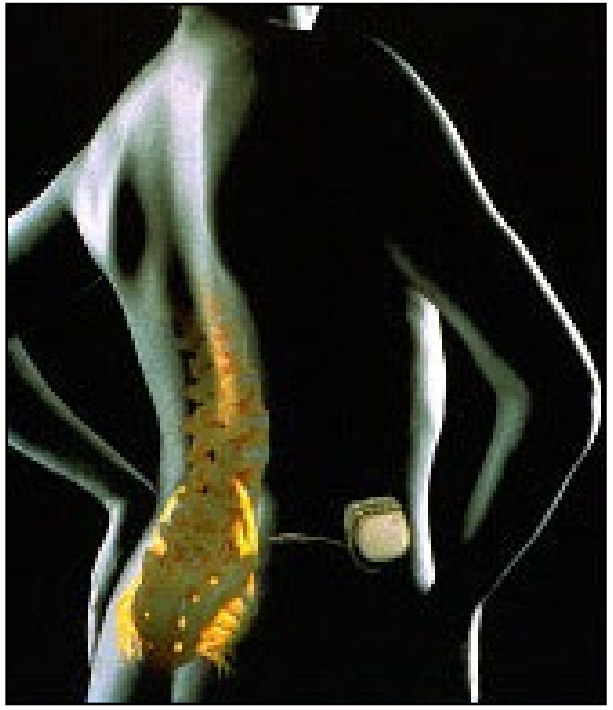


Mangera et al. Contemporary management of lower urinary tract disease with botulinum toxin A: a systematic review of botox (onabotulinumtoxinA) and dysport (abobotulinumtoxinA). Eur Urol. 2011 Oct; 60(4):784-795

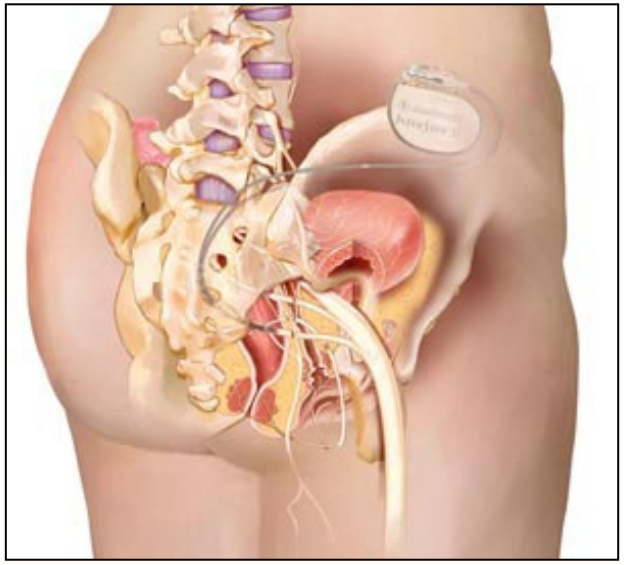
Sacral neuromodulation (SNM)

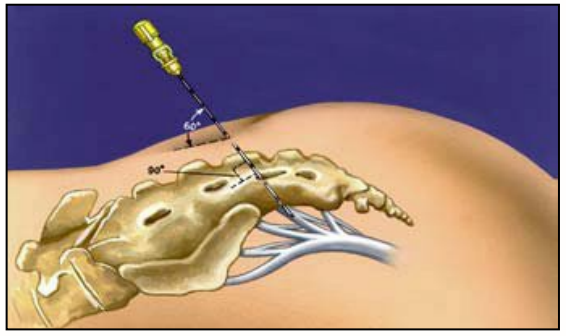


- InterStim®Sacral neuromodulation, now add'l Axonics ®
  - 1997 – Approved by the FDA refractory urgency UI, refractory urgency-frequency, and idiopathic nonobstructive urinary retention
  - 2011 – Approved for Fecal Incontinence
- The exact mechanism of action is uncertain; delivers mild electrical impulses
  - The electrodes are placed percutaneously adjacent to the S3 dorsal roots
    - Allows for communication with effector (bladder) organs and muscles (sphincter) innervated by the sacral nerves
  - If more than 50% improvement is seen, then patients will undergo permanent placement of the intermittent pulse generator
  - Adverse events: include lead migration, pain at the stimulator or lead site, infection, and transient electrical shock



Medtronic

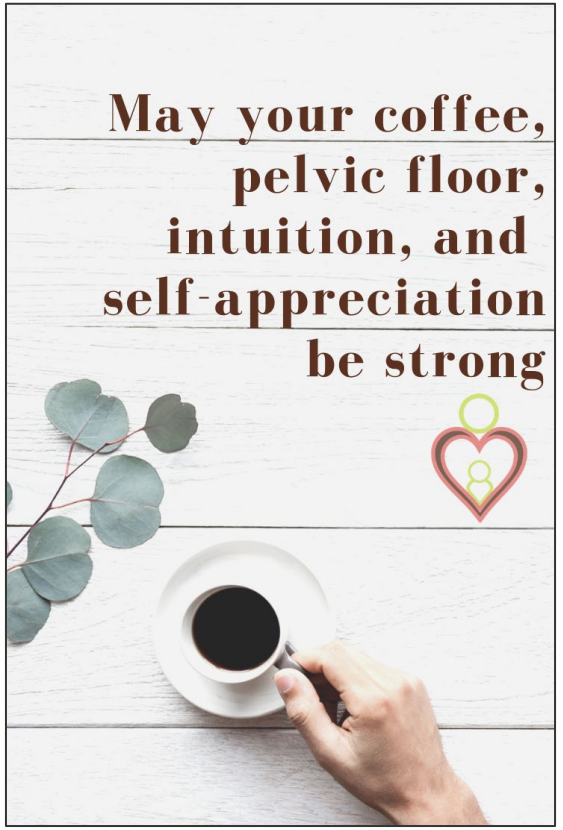




Axonics

Conclusions

- OAB is a treatable chronic condition
- The social stigma is slowly lifting
- Expectations do need to be managed
- Adherence to algorithms is important for efficacy
- Referral to specialists should be offered early
- The public health burden is significant



THANK YOU

"The good physician treats the disease; the great physician treats the patient who has the disease."
William Osler

Courtesy, uber nurse Angela Barney!

ferzandi@usc.edu

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www.acog.org
www.iuga.org

Boston, 2019

Australia 2024 "Rainbow IceCream!"