



Webinar Series

United Spinal Association

Webinar title: Incontinence is not an option:
Solutions for Bladder Management

Presenter/presenters:

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Director of Education

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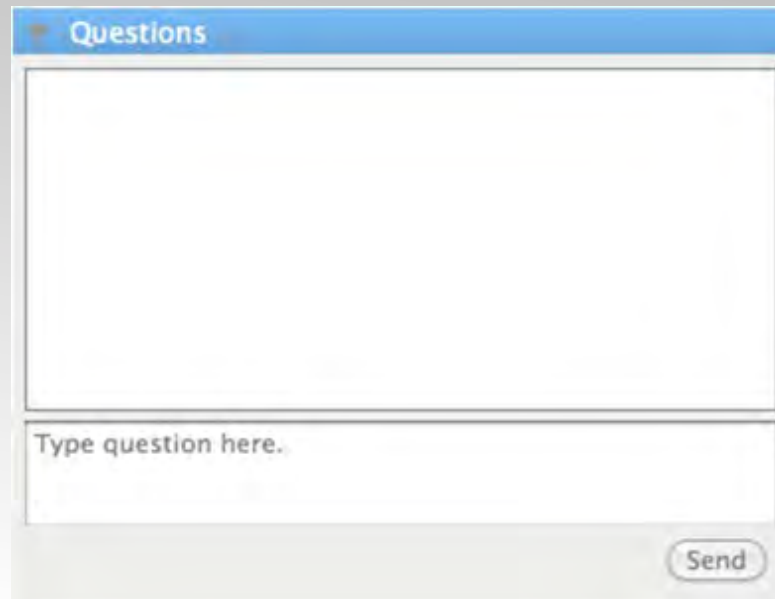
Jennifer French, MBA



Kimberly Anderson-Erisman, PhD



Want to Ask a Question?

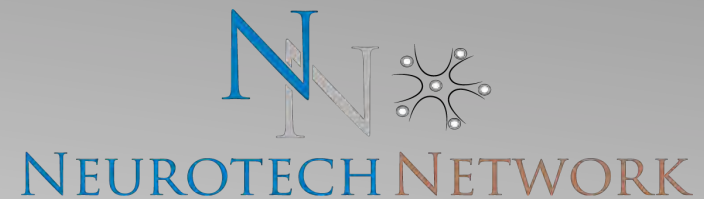


A screenshot of a web form titled "Questions". The form has a blue header bar with the word "Questions" in white. Below the header is a large, empty white rectangular area for text. At the bottom of the form is a smaller white rectangular area containing the placeholder text "Type question here.". To the right of this area is a rounded rectangular button labeled "Send".



www.themiamiproject.org

The Miami Project is dedicated to finding more effective treatments and, ultimately, a cure for paralysis resulting from spinal cord injury.



www.NeurotechNetwork.org

Helping people regain life thru ^gneurotechnology

Focusing on education of and advocacy to access neurotechnology devices, therapies and treatments for people living with impairments, their care-givers and medical professionals.



Disclaimer

The information presented in this webinar is not meant to replace the advice from a medical professional. You should consult a health care professional familiar with your specific case, concerns and condition.

Neurotech Network and its representatives do not endorse, rate, sell, distribute, prescribe, administer or recommend any products, procedures or services. We highly suggest for you to take information to a trained medical professional familiar with your case to discuss options that are best for you.



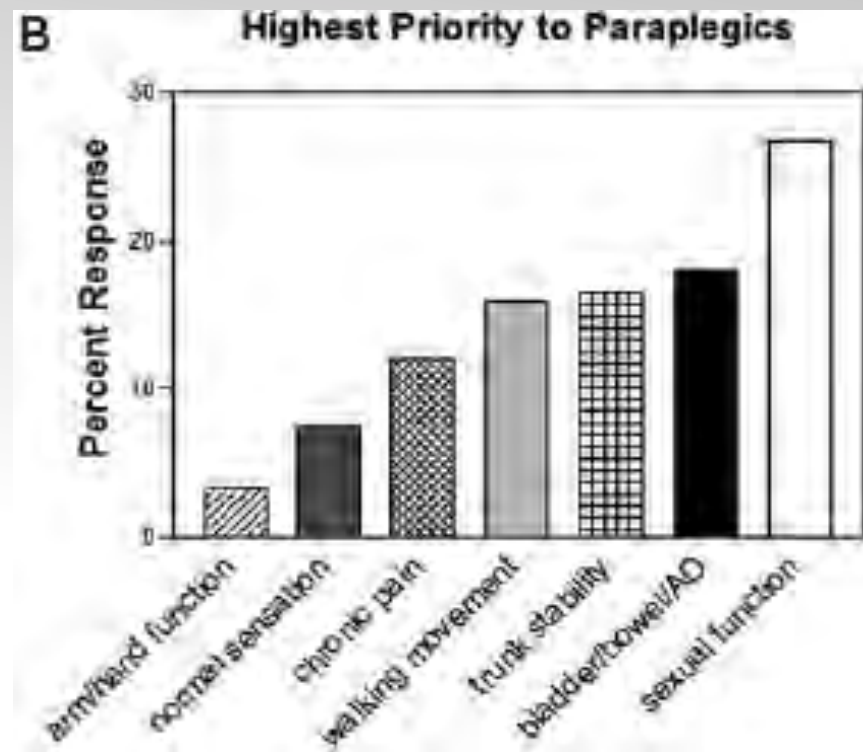
Webinar Agenda

- Introduction of urinary tract anatomy
- Complications from Poor Bladder Management
- Review options for people living with SCI/D
 - Catheterization/voiding techniques
 - Pharmaceuticals
 - Medical Devices
- Investigational & Clinical Trial options
- Resources to get for you to learn more



Bladder Function Ranks Highest

Bladder function consistently ranks as one of the most important items to regain function in people with SCI



Other Studies

Widerstrom-Noga et al (1999)

Pain, bowel, bladder, sexual, walking

Donnelley et al (2004)

Functional mobility (transfers, wheelchair use), dressing, grooming

Furlan et al (review 2006)

Motor, bladder, bowel, sexual, pain

Ditunno et al (2008)

Bowel, bladder, walking,

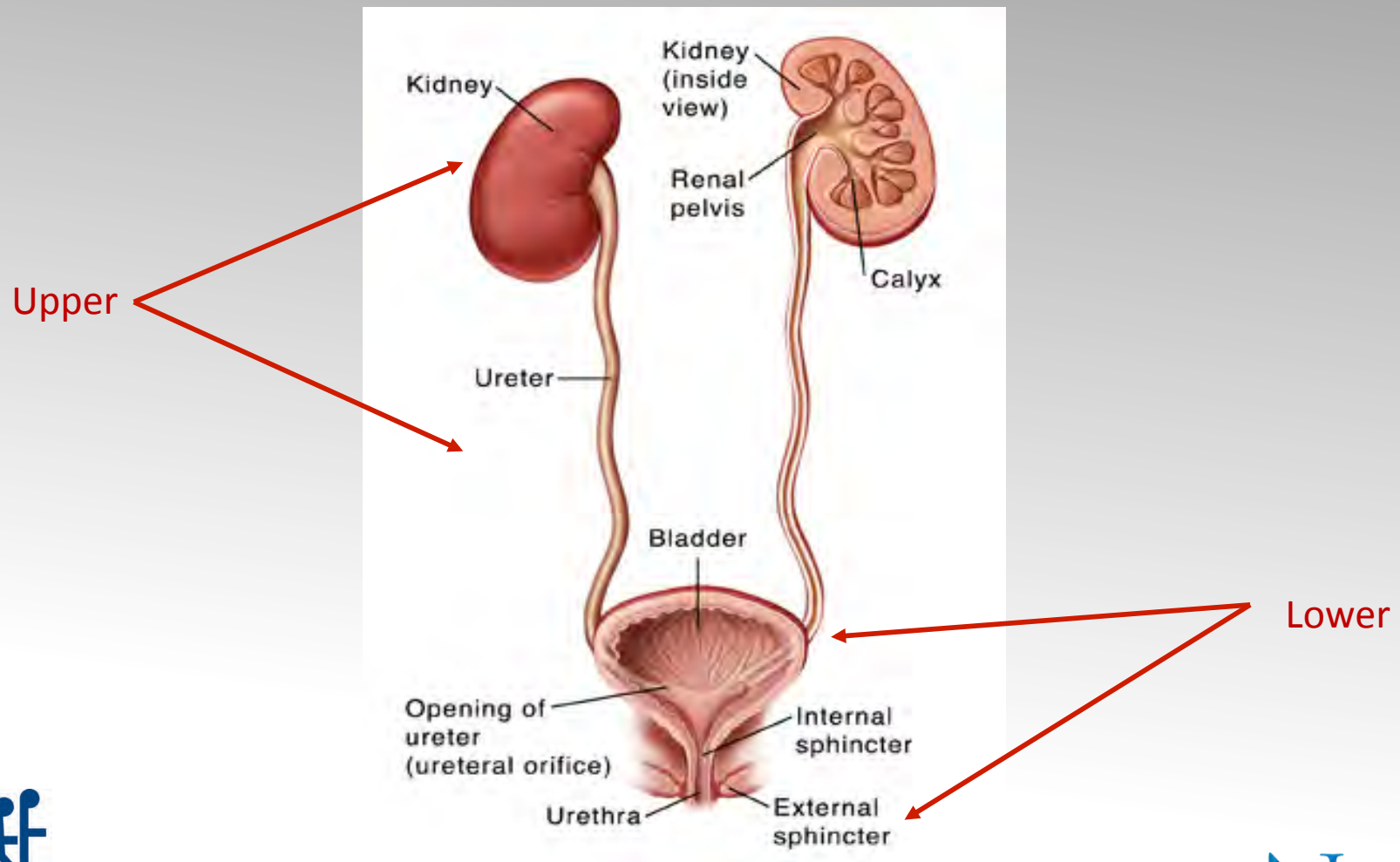
Simpson et al (2012; SCIRE systematic review)

Motor (arm/hand, mobility), bowel, bladder, sexual

The Bladder & SCI/D

- Overview
 - Brief overview of urinary anatomy and physiology
 - Types of voiding dysfunction
 - Classification of bladder management methods

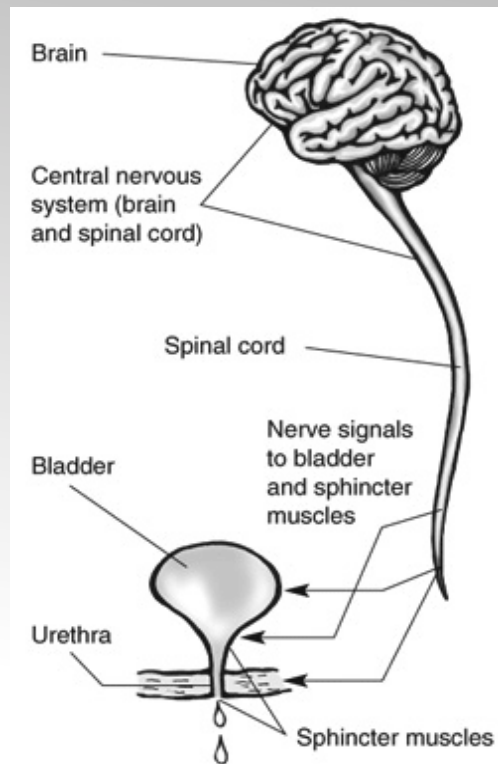
Brief overview of urinary anatomy and physiology



Slide provided by Melissa Schmitt, [Cleveland FES Center](#)



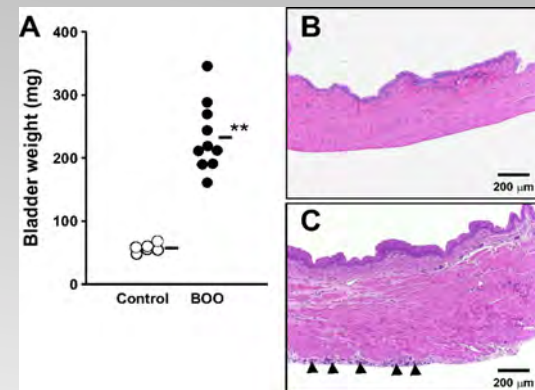
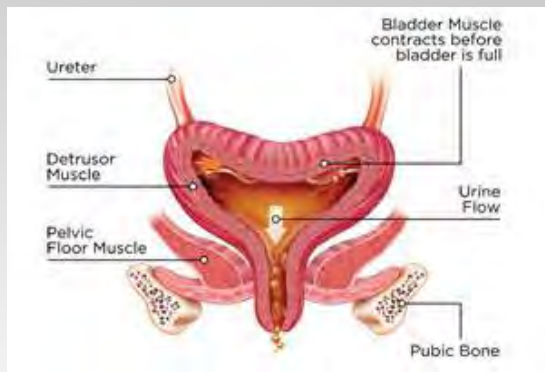
Control of the Bladder



Voiding Dysfunctions after SCI

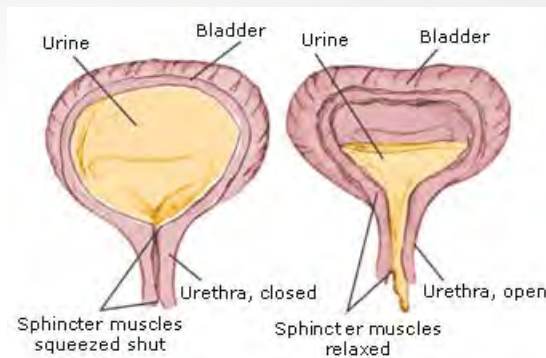
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Hypertrophy



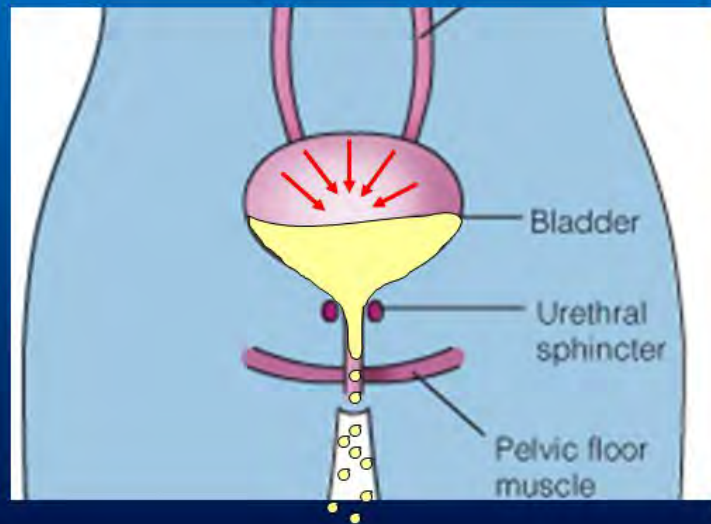
Slide provided by Melissa Schmitt, [Cleveland FES Center](#)

<http://ajrenal.physiology.org/content/304/7/F1020>



Dyssynergia

Neurogenic Detrusor Overactivity



Bladder
-Overactive

Sphincter
-Underactive

Complications from Poor Bladder Management

- Source of infection, UTI
- Renal injury or failure
- Urinary tract damage
- Autonomic dysreflexia*
- Loss of Independence
- A smelly, stinky mess

Autonomic Dysreflexia (Hyper-reflexia)

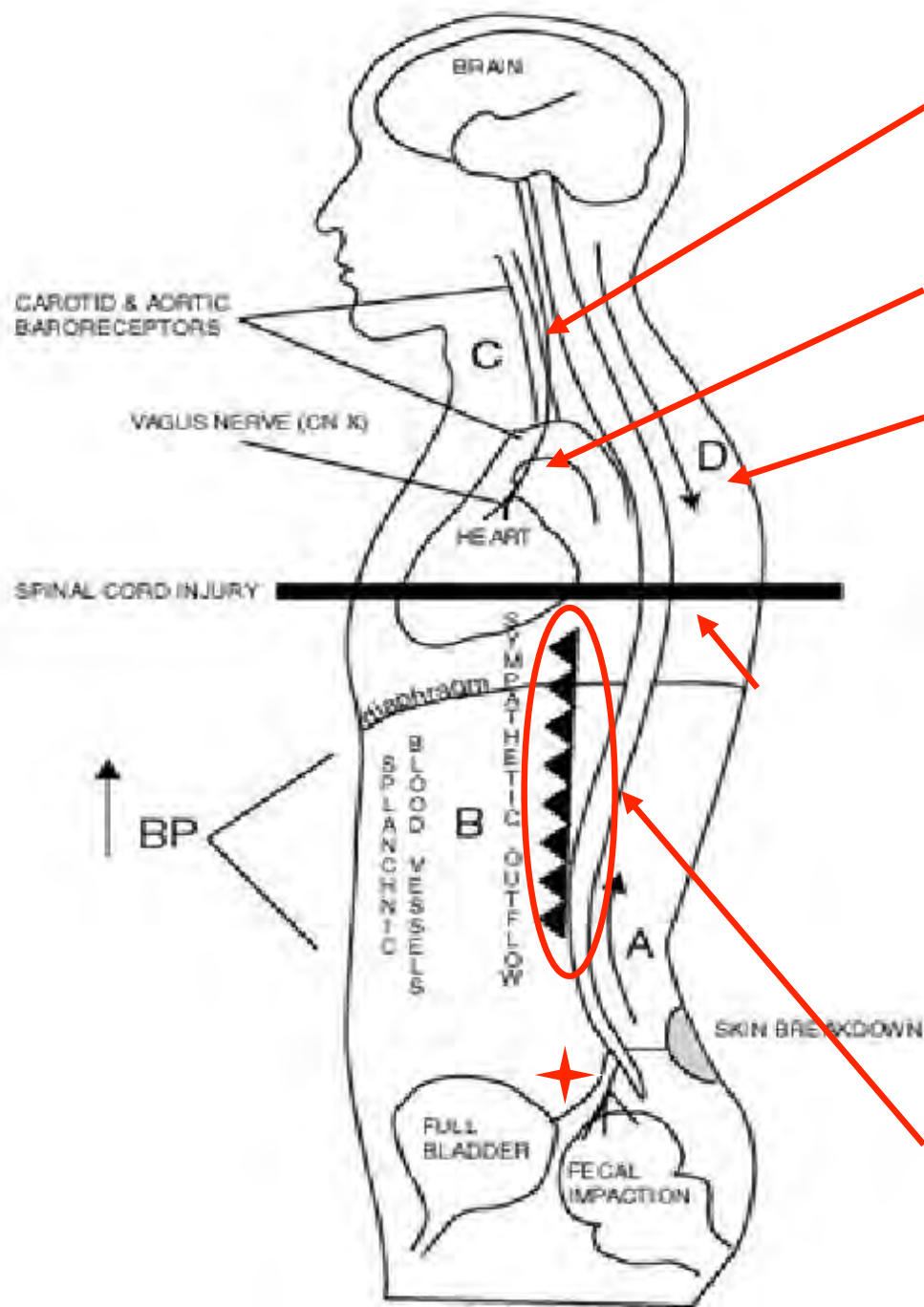
■ Sympathetic Nervous System

- ✧ thoraco-lumbar (T5-L2 major splanchnic outflow)
- ✧ “fight or flight” (release epinephrine & norepinephrine)
- ✧ vasoconstriction
- ✧ Increase heart rate

■ Parasympathetic Nervous System

- ✧ Cranio-sacral
- ✧ Vasodilation
- ✧ Decrease heart rate

■ Negative feedback loop



Intact carotid & aortic baroreceptors detect rising BP

Brain responds to high BP:

1. Slows heart rate via vagal nerve
2. Triggers sympathetic inhibitory outflow, which induces vasodilation, but signal only reaches areas above level of lesion
3. Thus, continued vasoconstriction below level of lesion

Leads to an uncontrollable cycle of continually increasing BP and decreasing HR, which could result in stroke, hemorrhage, or death.

Noxious stimulus below the level of injury

Signal cannot reach brain

Afferent input to SC, however, triggers a sympathetic splanchnic response, which induces vasoconstriction – BP increases rapidly. Also triggers release of adrenal catecholamines.



Treating AD

- Sitting position to reduce ICP.
- Identify noxious stimulus and eliminate it
- If stimulus cannot be identified and/or eliminated, go to Emergency Room immediately.
- Monitor BP (>160 systolic)
- Careful administration of Nifedipine, nitro paste, or other anti-hypertensives
- Must make sure BP does not bottom out

Goals of Bladder Management

1. Preserve upper tract
2. Minimize lower tract complications
3. Compatibility with the person's lifestyle

Bladder Management Methods

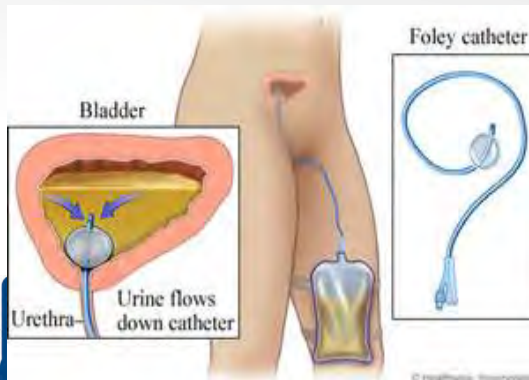
Intermittent Catheterization



Crede/Valsalva Maneuver



Indwelling Catheterization



External/Condom Catheter



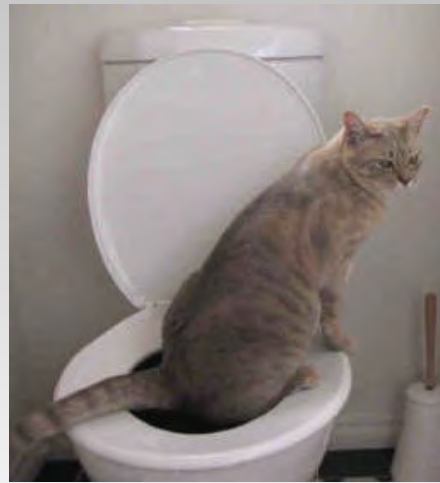
Bladder Management Methods

Medications



Alpha-blockers (reduce urethral resistance)
Botulinum toxin (Botox)

Reflex Voiding

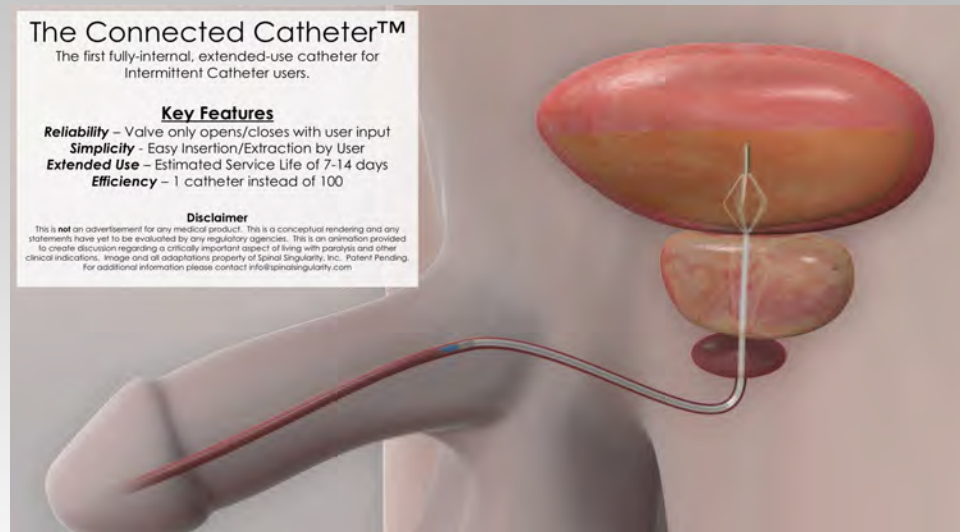


Surgical Interventions



Endourethral stents
Transurethral sphincterotomy
Bladder augmentation
Continent urinary diversion
Cutaneous ileovesicostomy

Strategies under development

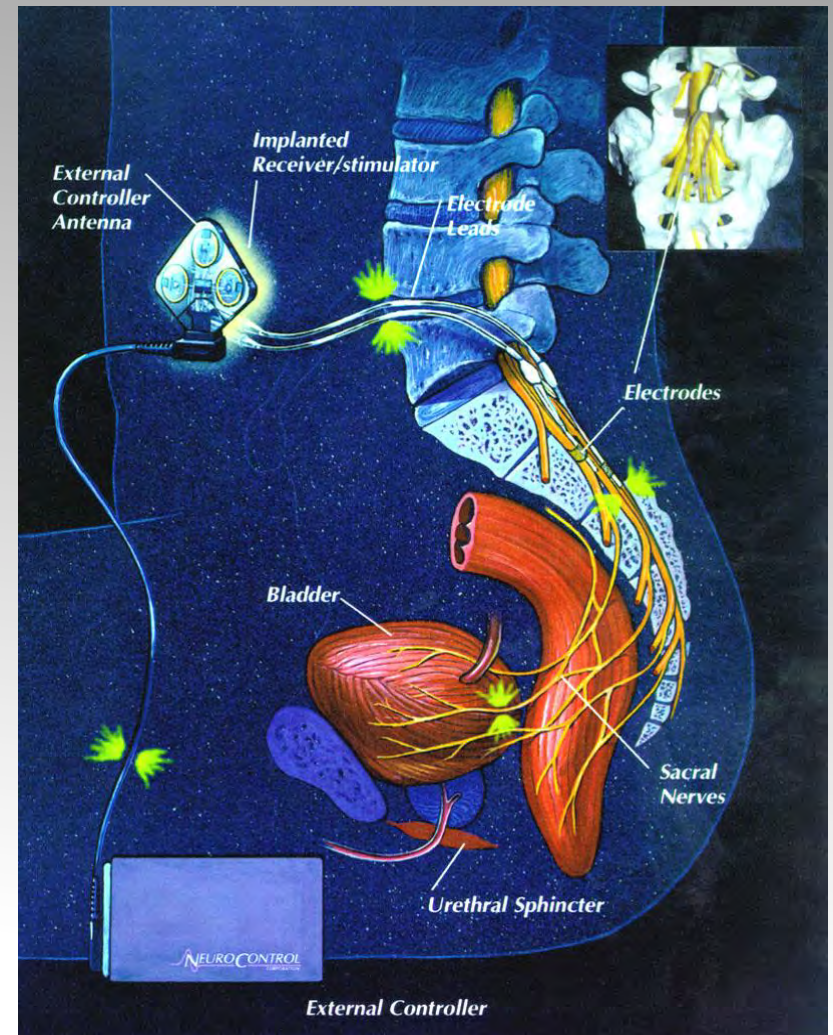


<http://www.spinal Singularity.com/>

- Semi-permanent
- Fully internal
- Smart catheter – pressure sensor

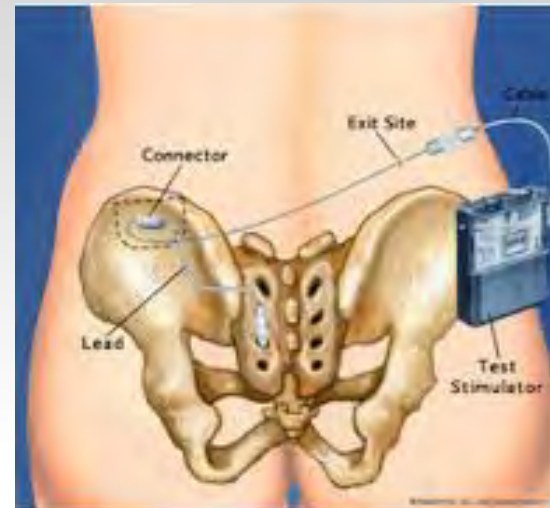
Medical device: Finetech-Brindley and VOCARE

- FDA & CE Mark approved
- Requires surgery and dorsal rhizotomy
- Provides 3 functions — bowel, bladder, erection.
- On-demand function – user could activate and shut down stimulation
- Finetech Medical



Medical device: Sacral Nerve Stimulation

- Simple implantation
- Commercially available for overactive bladder management
- Also can be implanted for fecal incontinence
- Before permanent implantation, a trial lead can be implanted
- Medtronic Interstim©
- Axonics Sacral Neuromodulation



Medical Device - Tibial Nerve Stimulation

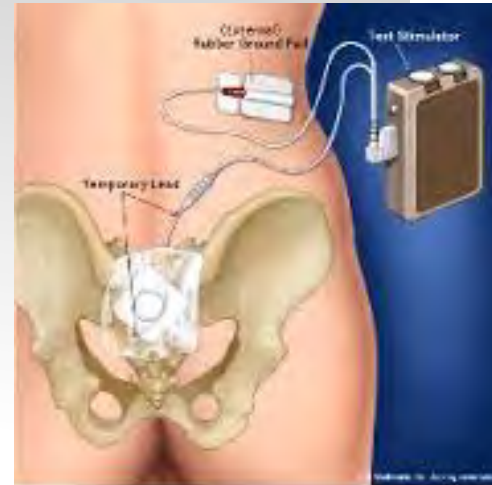
- Congentix, Urgent PC
- Nuviant Medical
- Medtronic, NURO
- StimGuard
- BlueWind Medical



Uses percutaneous electrodes to control the bladder by stimulating the tibial nerve in the lower leg

Medical Device: Pelvic Floor Stimulation

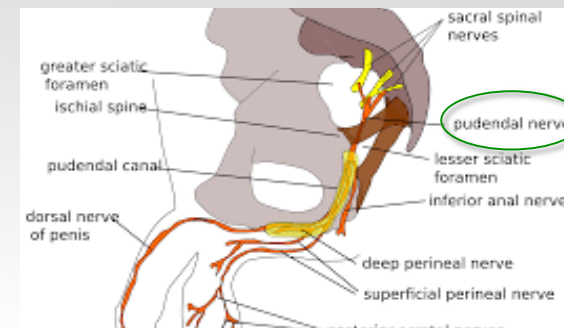
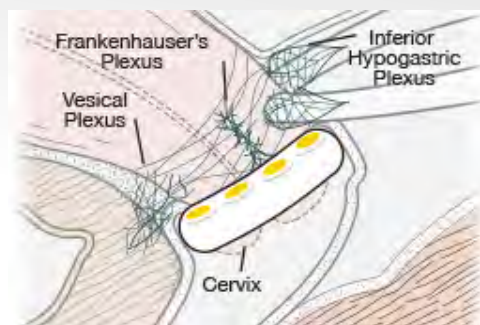
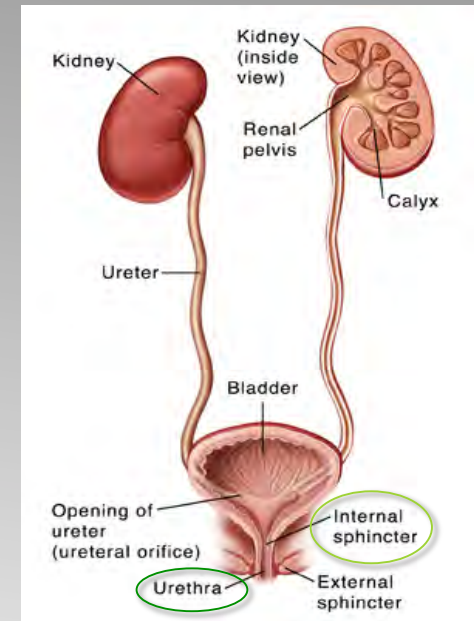
- Liberty[®] from Utah Medical Products
- Minnova[®] from Empi, Inc
- evadri from Biomation
- Pelvic Muscle Traine[®] from Athena
- NeoControl[®] from Kitalpha
- InWave Zynex Medical
- Stiwell med4 from Otto Bock



Provides stimulation to the pelvic floor muscles to improve the opening and closing of the urethral

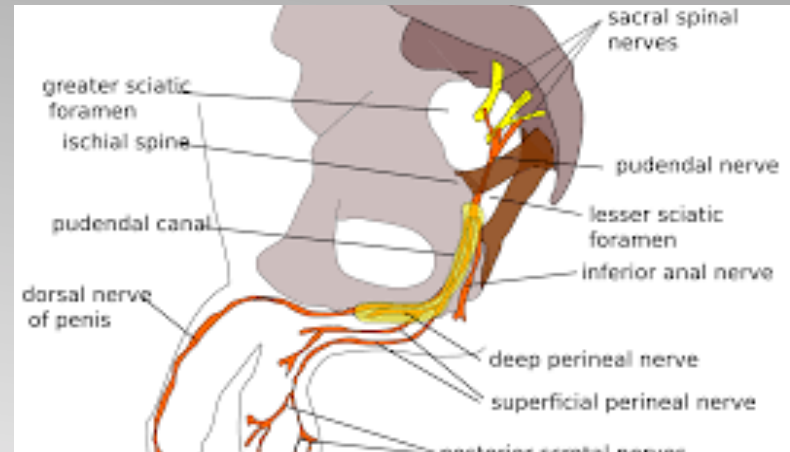
Investigational

- Epidural Stimulation
- Urethral stimulation, CWRU
- Sphincter sensory stimulation, CWRU
- Dermatome Stimulation, CWRU
- Pudendal Nerve Block stimulation
- FemPulse



Investigational: Genital Nerve Stimulation

- Clinical Trials
- 20 participants
- Bladder inhibition can be obtained at lower stimulation amplitudes than typically used



Reflexively inhibits the bladder by stimulating the dorsal penile or dorsal clitoral nerve – a very superficial nerve easily accessed through surface stimulation

Resources

- You may find devices in development at Clinical Trials.
 - There are many clinical trials being conducted in this area, including sacral, pudendal and tibial nerve stimulation to name a few. Visit ClinicalTrials.gov.
- Cleveland FES Center: www.FEScenter.org
- Neurotech Network Fact Sheet for Bladder Management
http://www.neurotechnetwork.org/factsheets/factsheet_urinary.html
- Neurotech Network Fact Sheet for Spinal Cord Injury
http://www.neurotechnetwork.org/factsheets/factsheet_spinalinjury.html



Bowel Webinar Preview – May 5, 2016

- How does the bowel work?
- What happens after SCI?
- Importance of nutrition
- Medications that may help
- Technology to help you
- Complications to be aware of
- Resources to learn more





Webinar Series

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