



CAIRIBU URO-AGING RESEARCH INTEREST GROUP (UroAging RIG)

CAIRIBU URO-AGING KNOWLEDGE EXCHANGES

EXECUTIVE SUMMARY 10/27/2025

URO-AGING RESEARCH INTEREST GROUP

FEAT: NATASHA WILKINS, PHD

10/27/25 [3-4PM ET]

(2PM CT | 12PM PT)



Goal: Facilitate knowledge exchange and spur collaborations in uro-aging research and adjacent fields

Summary

Dr. Natasha Wilkins: Current neuromodulation options for neurogenic pelvic dysfunction in the elderly

Introduction to neurogenic bladder dysfunction and age

- Neurogenic bladder is caused by disruption between the bladder and its neural control and typical associated symptoms include loss of bladder control, increase in urinary frequency, sudden urgency, inability to empty one's bladder completely, leaking urine, and/or having poor urinary force while trying to void.
- To develop definitive diagnosing and to determine if an elderly patient's condition is neurogenic bladder dysfunction, clinicians follow a number of steps: 1) have the patient complete questionnaires; 2) perform a pelvic exam and urine analysis; and 3) have the patient complete a bladder diary.

Prevalence and impacts of neurogenic bladder dysfunction

- Barriers to accurate reporting in prevalence can be attributed to lack of differentiation between neurogenic bladder and other bladder dysfunction types, lack of distinction between neurogenic bladder dysfunction types, and inaccurate reporting of bladder dysfunction stemming from social stigma
- **Overactive bladder (OAB) is seen in >30% of adults 65+ in the US** and among >50% of 75+ population in Europe, with those assigned female at birth experiencing OAB at higher rates their male counterparts.
- OAB is linked to mental, social, and physical health issues, such as depression, decreased social, physical, and sexual activity, and increased risk of falls, urinary tract infection, skin breakdown and infection, and bowel problems. OAB also presents significant treatment costs and additional out-of-pocket costs.
- The growing elderly population and the mental, social, physical, and financial costs of OAB underscores the need to study this issue to improve treatment and patient care.

Treatment course for neurogenic bladder dysfunction

- Treatment courses range from conservative approaches to mildly invasive.
- Conservative approaches are the first course of treatment – often involving pelvic floor therapy or behavioral management.
- In cases where conservative interventions are not impactful, physicians will employ pharmaceutical interventions, such as anti-cholinergic medications and anti-diuretic hormone.
- When conservative and pharmaceutical treatments fail to address OAB, mildly invasive treatments are employed. **The first is onabotulinumtoxinA** which decreases activity and contractile force within the detrusor to decrease OAB-associated symptoms. **The second is electrical neuromodulation** – the two primary types being sacral nerve stimulation and tibial nerve stimulation.

How neurogenic bladder dysfunction develops

- A healthy bladder depends on functional sensory circuitry that takes sensory feedback from the bladder and urethra to determine whether it is appropriate to void at any given time. *Note: the external urethral sphincter and pelvic floor have voluntary control which is important to consider in the context of various types of degeneration and injury.*

- **The elderly experience aging-related degeneration across the sympathetic and parasympathetic nervous systems and may also live with disease or trauma that contribute to neurogenic bladder dysfunction.** These factors contribute to heterogeneous experiences of elderly patients with neurogenic bladder dysfunction, emphasizing the need for individualized healthcare.

Electrical neuromodulation as an intervention

- Neuromodulation uses electricity to target or disrupt the activity of specific neurons that are dysfunctional by working with existing circuitry.
 - **Neuromodulation, which is able to be used in conjunction with less invasive intervention and is highly adaptable, has the potential to be highly individualized.**
 - It has the potential to improve symptoms in those non-responsive to less invasive treatments.
- Sacral nerve stimulation is an FDA-approved intervention for bladder and bowel dysfunction. Dr. Wilkins described the implant procedure and test phase.
 - With this treatment, 83% of patients exhibited greater than 90% reduction in symptoms, demonstrating the success of sacral nerve stimulation in the elderly population.
- Tibial nerve stimulation uses electrical stimulation to target the posterior tibial nerve for overactive bladder, fecal incontinence, and chronic pain.
- Tibial nerve stimulation incorporates the use of implantable devices and requires regular stimulation sessions.
- Compared to sacral nerve stimulation, tibial nerve stimulation is less invasive.

Natasha Wilkins, PhD, is a Postdoctoral Associate in the Department of Biomedical Engineering at Duke University. She works in the Grill laboratory, where she conducts preclinical experiments to determine the efficacy of sacral nerve stimulation as a treatment for bowel dysfunction induced by spinal cord injury. As a scholar in the Duke KURE program, Dr. Wilkins will expand her work on sacral nerve stimulation to address neurogenic bladder dysfunction resulting from spinal cord injuries. This research aims to develop a framework for the application of sacral nerve stimulation as a therapeutic option for those suffering from this condition. In addition to her work in neuromodulation, Dr. Wilkins is passionate about improving the quality of life for individuals with neurogenic bladder dysfunction. She is also dedicated to destigmatizing female urinary and sexual dysfunction to foster greater conversation within the scientific community and enhance transparency between patients and clinicians.