

**MetroHealth Medical Center**

**RESEARCH DAY 2023**

**Abstract Submission Form**

**Poster Title:** Translation of a Wearable, Non-invasive Stimulation Device to Treat Incontinence in People with Neurogenic Bladder

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**Location of Laboratory:** Old Brooklyn Campus

**Category:** Physical Medicine and Rehabilitation

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**OBJECTIVE:** A top priority for individuals with spinal cord injury (SCI) is the treatment of urinary urgency and incontinence associated with neurogenic bladder. Multiple clinical studies have shown non-invasive stimulation of the genital nerves (GNS) strongly inhibits bladder contractions acutely and is well-tolerated. In this presentation, we discuss preliminary findings of our study of self-administered, “at-home” GNS over a 1-year period.

**DESIGN/METHODS:** This study is a “before-and-after” prospective cohort study; participants acted as their own controls. Nine individuals with neurogenic bladder were enrolled and confirmed to: 1) have neurogenic bladder by urodynamics examination and 2) have bladder contractions inhibited by GNS administered in the lab. 5 participants who both tolerated GNS without additional medications and were adherent to the completion of voiding diaries completed the study to test the efficacy of at-home, self-administered GNS using a commercial TENS unit. Participants completed voiding diaries to track voiding, leak, and urgency events. Diaries were completed during a control period without GNS, and then for 3 separate periods during use of GNS (baseline, 6 months, 1 year). Participants also completed a bladder-related quality of life questionnaire (Qualiveen) at their initial evaluation, as well as 6 and 12 months later.

**RESULTS:** GNS increased the bladder capacity of all 9 individuals tested by an average of 58%, and 3/5 individuals that tested chronically maintained an increased bladder capacity after 6 months of GNS. 4/5 individuals reported increased bladder-related QOL after 6 months of at-home GNS. Of the 2 individuals who experienced leakage with adequate voiding, one reduced their leaks/day by 90% at 6 months of use and the other by 30% at 1 year of GNS. The primary reason that individuals reported for dropping out of the study or being unable to reduce urgency was the cumbersome nature of placing the electrodes and keeping them in the correct place.

**CONCLUSION:** GNS is a viable technology that can provide a durable reduction in leakage events for individuals with incontinence due to neurogenic bladder. Further development is needed to streamline the design in order to meet user needs.