

preferring a swing through gait pattern for ambulation and a reciprocal gait pattern for ascending stairs.

Conclusion: These first 2 subjects demonstrate initial feasibility of the Praxis system for upright mobility. Further research will examine more options for extending standing time, including alternating muscles, as well as external sensors for provision of joint position feedback to allow the system to react to a knee buckle.

#20 IMPROVED BLADDER/BOWEL MANAGEMENT WITH THE PRAXIS ELECTRICAL STIMULATION SYSTEM

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Background: A common consequence of suprasacral spinal cord injury (SCI) is loss of bladder and bowel control leading to urinary incontinence and constipation. The Praxis Functional Electrical Stimulation system provides the potential for improved bladder/bowel management through stimulation that modulates the hyper-reflexive bladder and facilitates rhythmic contractions of the distal colon.

Design: This is a feasibility study conducted in a pediatric orthopedic hospital.

Methods: Two men with thoracic SCI, ages 18 and 21 years, underwent surgical implant of the Praxis system. A 22-channel stimulator was placed in the lower left chest area; a pocket computer-powered and controlled the stimulator transcutaneously via a transmit coil. As the bladder/bowel component of the system, 4 channels were allocated for epineural/epidural stimulation of the S2, S3, and S4 sacral nerves and the conus medullaris. Following implantation, subjects underwent a series of studies to assess the ability of electrical stimulation to acutely affect bladder and bowel contractions. These results defined stimulation parameters in protocols that assessed the effect of chronic stimulation.

Results: Multiple cystometrograms tests with Subject 1 demonstrated that acute stimulation of S3 bilaterally eliminated spontaneous bladder contractions at low fill volumes and provided increased bladder capacity. A multi-week study then showed that the subject's self-catheterization schedule with chronic stimulation was comparable to that seen with anti-cholinergic medication. Testing with Subject 2 demonstrated that stimulation of S3 bilaterally caused smooth muscle contractions in the distal colon. A bowel program was then developed and used daily by the subject. A satisfaction survey obtained over 9 continuous days of use indicated that the stimulation protocol provides a superior level of bowel management.

Conclusion: Electrical stimulation with the Praxis system improved bladder and bowel function in 2 individuals with SCI. Future work will extend the system to include the ability to void.

UROLOGIC MANAGEMENT

#21 EFFECTIVENESS OF NON ANTIBIOTIC ALTERNATIVES IN TREATING ACUTE UTI FOLLOWING SCI

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Objectives: Urinary tract infections (UTI) are the most common complication in those with SCI. Because of possible side effects and concerns of bacterial resistance, individuals with SCI frequently ask about non-antibiotic alternatives to treat UTI. Two commonly used non-antibiotic alternatives are *Uva ursi* (Europe) and cranberry (USA). The objective of this study was to determine the effectiveness of cranberry and *Uva ursi* compared with an antibiotic in treating acute UTI.

Design: Prospective randomized controlled animal study.

Methods: This study was done using a well-established SCI animal model, the Sprague-Dawley rat. Attempting to evaluate a treatment in humans is difficult and usually requires a large sample size because of many variables, such as bladder management in humans with SCI. SCI rats with documented

UTIs were given amoxicillin, *Uva ursi* or cranberry for 7 days. A UTI is defined as having concurrent bacteria and pyuria. A urinalysis and C&S was done 3 days post treatment. Treatment was considered successful if there was complete resolution in the elevated WBCs.

Results: There was 60% resolution of UTI using amoxicillin, 72% resolution using *Uva ursi* and no resolution using cranberry. The Barnard's Unconditional Test of Superiority Using Difference Of Two Binomial Proportions showed *Uva ursi* was superior to cranberry ($p=0.01$). There was a trend suggesting amoxicillin was superior to cranberry ($p=0.07$).

Conclusion: Therapy with either amoxicillin or *Uva ursi* had similar results in the resolution of acute UTI. Cranberry was not effective in treating acute UTI.

EXTRACORPOREAL SHOCKWAVE TRIPTY IN PATIENTS WITH SPINAL

Please note that none of the studies this year were given credit for their funding agency (even though it was submitted with the grant). I called in a complaint and since then, this has not been a problem. I did give full credit during my presentation.

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Background: Extracorporeal shockwave therapy has become a mainstay in the treatment of chronic pain.