Webinar title: Solutions for Bowel Management while living with SCI/D

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Want to Ask a Question?
www.NeurotechNetwork.org

Helping people regain life thru neurotechnology

www.themiamiproject.org

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

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

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

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

Other Studies

  Pain, **bowel**, bladder, sexual, walking
  Functional mobility (transfers, wheelchair use), dressing, grooming
Furlan et al (review 2006)
  Motor, bladder, **bowel**, sexual, pain
  **Bowel**, bladder, walking,
Simpson et al (2012; SCIRE systematic review)
  Motor (arm/hand, mobility), **bowel**, bladder, sexual
The Bowels & SCI/D

• Overview
  • Brief overview of lower gut anatomy and physiology
  • Types of voiding dysfunction
  • Classification of bowel management methods
Brief overview of anatomy and physiology

- GI tract
- Peristalsis
- Bowel
- Absorb nutrients
- Eliminate waste
Control of the Bowels

http://what-when-how.com/acp-medicine/gastrointestinal-motility-disorders-part-1/
Voiding Dysfunctions after SCI

Reflexic (injury above sacral segments—T12 and above):
• Reflex peristalsis remains intact,
• stool will not usually exit the rectum without stimulation.
• Therefore, defecation can be triggered by using stimulant medication and by stimulating the rectum (using a finger or device) to open the anal sphincter so stool comes out.

Areflexic (injury to sacral segments—T12 and below):
• Reduced or absent peristalsis as well as anal sphincter reflexes,
• stool can leak out at any time.
• Stool needs to be removed manually one to three times a day to reduce accidents.
Complications from Poor Bowel Management

- Constipation
- Fecal Impaction
- Fecal Incontinence
- Hemorrhoids
- Long bowel program
- Mucous leakage
- Excessive gas
- Diarrhea
- 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**
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.

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.
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.
Bowel Management Components

- Evacuation method
- Nutrition & Fluids
- Schedule
- Medications &/or Devices
Importance of Nutrition

Eat Well, Live Well, with Spinal Cord Injury

A practical guide to help individuals with spinal cord injuries address secondary health complications in SCI through nutrition.

http://www.eatwelllivewellwithsci.com/

Chapter #1  Nutrition for Digestion (review chapter)
Chapter #2  Nutrition for Neurogenic Bowel
Chapter #3  Nutrition for Neurogenic Bladder
Chapter #4  Nutrition for Cardiovascular Health
Chapter #5  Nutrition for Weight Loss
Chapter #6  Nutrition for Respiratory Health (review chapter)
Chapter #7  Nutrition for Pressure Sores
Chapter #8  Nutrition for Bone Health
Chapter #9  Nutrition for Liver
Chapter #10 Nutrition for Pain
Chapter #11 Nutrition for Sleep
Chapter #12 Nutrition for Fatigue
Chapter #13 Nutrition for Stress
Chapter #14 Nutrition for Depression (review chapter)
Chapter #15 Nutrition for Anxiety
Chapter #16 Nutrition for Overall Health
Importance of Nutrition


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<thead>
<tr>
<th>FOODS THAT SLOW</th>
<th>DIET AND CONSTIPATION</th>
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<tbody>
<tr>
<td>Low-fiber foods</td>
<td>When it comes to constipation, it comes down to going or not going. Below are a list of foods to avoid and a list of foods to stock up on.</td>
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<tr>
<td>White bread</td>
<td>Dairy products</td>
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<td>White rice</td>
<td>Cheese</td>
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<td>Processed foods</td>
<td>Milk</td>
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<td>Potato chips</td>
<td>Ice cream</td>
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<td>Corn chips</td>
<td>Sugar/desserts</td>
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<td>Instant mashed potatoes</td>
<td>Pastries</td>
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<td>French fries</td>
<td>Candy</td>
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<td>Pizza</td>
<td>Caffeine</td>
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<td>Red meat</td>
<td>Coffee</td>
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<td>Pork</td>
<td>Soda</td>
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<td>Beef</td>
<td>Chocolate</td>
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<tr>
<th>FOODS TO GO</th>
<th>Vegetables</th>
<th>Beans and Legumes</th>
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<tr>
<td>High-fiber foods</td>
<td>Whole grains</td>
<td>Brazil nuts</td>
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<td>Brown rice</td>
<td>Pears</td>
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<td>Psyllium husk</td>
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<td>Apple pectin</td>
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<td>Popcorn</td>
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<td>Oatmeal</td>
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<td>Fruit</td>
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<td>Prunes</td>
<td>Broccoli</td>
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<td>Apples</td>
<td>Sweet potato</td>
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<td>Berries</td>
<td>Nuts and seeds</td>
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<td>Dates</td>
<td>Pumpkin seeds</td>
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<td>Figs</td>
<td>Peanuts</td>
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<td>Flaxseed</td>
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Bowel Management Methods

Medications
- Stimulants
- Laxatives
- Stool Softeners
- Prokinetic meds

Reflex Voiding
- Positioning
- Abdominal massage
  - Forward/sideways bending
  - Push-ups
  - Valsalva maneuver

Surgical Interventions
- Colostomy
- Ileostomy
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
  • http://finetech-medical.co.uk/en-us/products/finetechbrindleybladdercontrolsyste m.aspx
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
  - http://www.axonicsmodulation.com
Medical Device - Irrigation

Trananal Irrigation
- Use of a rectal catheter to introduce water
- Peristeen® by Coloplast, www.coloplast.com

Pulsed Irrigation Evacuation
- Use of a rectal catheter to introduce water
- PIE*, piemed.com
Medical Device: Implanted Magnetics

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

Torax Medical: www.toraxmedical.com
Investigational

• Bowel Training: NCT02406859
  • Utility of an Animated *Bowel* Biofeedback Training Routine to Improve *Bowel* Function in Individuals With SCI

• Bowel Function & Exoskeleton: NCT02314221
  • A Randomized, Crossover Clinical Trial of Exoskeletal-assisted Walking to Improve Mobility, *Bowel* Function and Cardio-Metabolic Profiles in Persons With SCI

• Bowel & Electrical Stimulation: NCT02641483
  • Afferent Stimulation to Evoke Recto-colonic Reflex for Colonic Motility

• Bowel Transdermal Agent: NCT02370862
  • Transdermal Administration of a Prokinetic Agent for Bowel Evacuation in Persons With SCI
Resources

- You may find devices in development at Clinical Trials.
  - There are many clinical trials being conducted in this area, including sacral nerve stimulation, fcal incontinence, bowel management to name a few. Visit ClinicalTrials.gov.

- Neurotech Network Fact Sheet for Bladder/Bowel Management
  http://www.neurotechnetwork.org/factsheets/factsheet_urinary.html

- Neurogenic Bowel: What you should know
  http://www.pva.org/site/c.ajlRK9NJLcJ2E/b.8907631/k.6CDF/PDFs_Consumer_Guides.htm

- National Association for Continence: http://www.nafc.org

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