

Spinal Cord Injury SIG

Spring 2013



Letter from the Chair

Welcome to the Spring 2013 edition of our SCI SIG newsletter! We hope this letter finds you all safe and well. This time of year, the Neurology Section SIGs change over their leadership positions (June 1st). Sadly we have to say goodbye to **Sue Ann Sisto, PT, PhD**, our Vice Chair and **Twala Maresh, PT, DPT, NCS, ATP** our Nominating Committee Chair. Both have contributed in countless ways to the activities of our SIG and both will be missed! Remember to cast your vote in the Spring Neurology Section elections for next year's candidates (see <https://www.bigpulse.com/m23092/intro>). The voting polls close on May 24th, 2013.

CSM 2013 was another great success. Many thanks go out to **Michael Goldfarb, PhD** and **Claire Hartigan PT, MPT** for their presentation on powered orthoses. Thanks also to **Jennifer French MBA; Candy Tefertiller, PT, DPT, ATP, NCS; Therese Johnston, PT, PhD, MBA; & Lisa Lombardo, PT, MPT** for their presentation on the application of FES for SCI rehabilitation. Despite some significant scheduling challenges, both were well attended. You can see summaries of the two SCI SIG sponsored presentations on page 2 of this newsletter. Also, access to all CSM education session handouts are available on-line through July 17th, 2013 (www.apta.org/CSM/handouts/). Start planning now for CSM 2014! Put in that time off request now for next year. CSM 2014 will be in Las Vegas, NV February 3-6th, 2014. The abstract submission deadline is May 20th, 2013 at 11:59 pm PT :-).

The SCI Edge Task Force for outcomes analyses and recommendations for SCI (**J. Kahn, PT, DPT, NCS, C. Newman, PT, MPT, NCS, P. Palma, PT, DPT, W. Romney, PT, DPT, NCS, R. Tappan, PT, NCA, C. Terfertiller, PT, DPT, ATP, NCS, E. Tseng, PT, DPT, NCS** and **C. Leon**), also presented at CSM 2013. Thanks to all for volunteering your time to this important project. You can read about their SCI Edge work which is now posted on the neurology section webpage (www.neuropt.org select professional resources)

In this newsletter, we have an 'ode' to bowel care post SCI. Depending on where you practice in the US, bathroom management and equipment ordering may fall under a Physical Therapist's list of job responsibilities. This newsletter will highlight bowel care following SCI and our Fall 2013 Newsletter is slated to review bladder management post SCI. Many thanks go out **Steven A Stiens MD MS, Julie Jennings, PT, NCS** and particularly **Marcie Kern PT, NCS**, who have assembled an amazingly comprehensive review of bowel care after SCI. The latter pages of this newsletter are meant to serve as a handout to provide directly to patients. We hope you find this information useful.

Lastly, I want to encourage any therapist out there who is considering sitting for the Neurologic Clinical Specialist's (NCS) exam to let this year be the one you take the plunge! You can log onto <http://www.abpts.org/home.aspx> to learn more. You must register to take the NCS Exam before July 31, 2013 but don't actually take the exam until March 2014. Well. That's all for now.

Until next time.....

Karen J. Hutchinson, SCI SIG Chair



KJ Hutchinson
SCI SIG Chair

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SCI SIG Officers:

- Karen J. Hutchinson, Chair
- SueAnn Sisto, Vice Chair
- Marcie Kern; Secretary
- Twala Maresh, Chair Nominating Committee
- Lauren McCullough, Nominating Com.
- Erin Culverhouse, Nomimanting Com.
- Joy Bruce, WebSite Guru

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APTA Combined Sections Meeting 2013 Recap

There were 2 sessions at CSM this year hosted by the SCI SIG. The first session was **Robotic Assistive Devices to Improve Quality of Life for Persons with Amputation and Paraplegia**. Recent advances in robotics technology have brought to the near horizon some new possibilities with respect to the development of assistive devices for purposes of enhancing the mobility and/or functionality of persons with physical disabilities. This talk focused on the development of three such assistive devices, which are intended to provide enhanced mobility and/or functionality for persons with lower limb loss, upper limb loss, and with paraplegia, respectively. All three of these devices were developed at Vanderbilt University, Center for Intelligent Mechatronics. Specifically, the talk described the development of a powered transfemoral prosthesis for lower extremity amputees, the development of a multigrasp hand for upper extremity amputees, and the development of a lower limb exoskeleton for legged mobility assistance in individuals with paraplegia. Videos highlighted the unique features and advanced performances of the lower limb and upper limb prostheses. The lower limb prosthesis, now licensed from Vanderbilt by Freedom Innovations, is the first of its kind to have powered control at both the knee and ankle. The upper limb prosthesis, referred to as the Vanderbilt Multi-Grasp Hand (VMGH), was designed to provide intuitive, real-time, robust, reliable, proportional control in multiple degrees of freedom. The lower limb exoskeleton, named Indego, is the only exoskeletal device that provides either full or partial assist, is modular and incorporates electrical stimulation to select muscle



Michael Goldfarb, PhD;
Clare Hartigan, PT, MPT

groups. A live demonstration of Indego took place, which brought people to their feet taking pictures, videos and asking great questions. (submitted by Sue Ann Sisto)

The second session at CSM was **Functional Electrical Stimulation Programs in the Clinic and at Home for People with Neurological Paralysis: Perspectives from the Clinician and the Consumer**. Candy Tefertiller, PT, DPT, ATP, NCS, Therese Johnston, PT, PhD, MBA, Lisa Lombardo, MPT, and Jennifer French, MBA.

FES utilization is increasing in both clinical and home settings. There are decades of evidence-based applications of FES for spinal cord injury. This talk focused on the practical application of FES from a programmatic perspective within the clinic as well as the consumer perspective in the clinic and at home. There was a review and discussion of the current evidence with a summary on FES parameters. Surface systems utilized for dorsiflexion assist and thigh cuffs for activation of quadriceps were presented. Currently available implantable systems demonstrated how an individual improved their ability to perform sit to stand and functionally reach for objects overhead. A panel of consumers who use FES on a daily basis were present to facilitate discussion regarding implementation and perceptions. (submitted by Marcie Kern)

Continuing Education Courses Summer/Fall 2013

APTA Conference & Exposition

June 26-29, 2013
Salt Lake City, UT

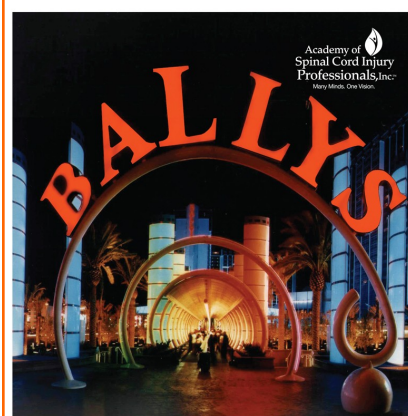
For more information:
[http://www.apta.org/
Conference/Overview/](http://www.apta.org/Conference/Overview/)



Academy of Spinal Cord Injury Professions—ASCIP

Sep 2-4, 2013
Las Vegas, NV

For more information:
<http://www.academyscipro.org/>



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Neurogenic Bowel — Lessons from the Literature

This newsletter was authored jointly by Marcie Kern, PT, MS, NRN Clinical Supervisor, TIRR, Julie Jennings, PT, NCS, SCI Program Manager, TIRR, Dr. Steven A Stiens MD MS, Associate Professor, Department of Rehabilitation Medicine, University of Washington, Attending Physician, SCI unit, VA Puget Sound Health Care System.

Therapy interventions which target specific patient priorities and needs are paramount, especially with the emergence of an increasingly dynamic health-care environment with fewer resources available for rehabilitation. It is also equally important to provide interventions that promote increased function, independence and quality of life, while also decreasing secondary complications and improved health and wellness after spinal cord injury. In the following pages of this newsletter we describe best practices for bowel care after spinal cord injury.

Existing evidence and literature helps inform this practice with these key lessons:

1. Improving bowel and bladder function is key in promoting quality of life for persons with spinal cord injury. In a study, *Targeting Recovery: Priorities of the Spinal Cord-Injured Population*, Kim Anderson demonstrated that when asked the question: "What gain of function would dramatically improve your life?", 681 responders indicated that improving bowel and bladder function is a shared priority for persons with tetraplegia and paraplegia. This has greater priority than regaining upper body and trunk strength, elimination of chronic pain, normal sensation and walking movement. Regaining bowel and bladder function ranked in the "top two" areas of importance for persons with tetraplegia (who ranked hand function as the number one priority) and paraplegia (who ranked sexual function as the number one priority). Anderson K. Targeting recovery: priorities of the spinal cord-injured population. *Journal of Neurotrauma*. 2004. Vol 21, No. 10. 1371-1383.

2. Satisfaction with the bowel program is directly correlated to these quality of life domains: symptoms, bowel function, work function, social function. **Three key problems with bowel care that have impact on quality of life are: time, pain/discomfort, and poor results.**

Pardee C., Bricker D., Rundquist J., Macrae C., Tebben C. Characteristics of neurogenic bowel in spinal cord injury and perceived quality of life. *Rehabilitation Nursing*. 2012. Vol 37, No. 3. 128-135.

3. Bowel programs and bowel care must be patient centered, individualized, and comprehensive to include many factors such as diet, medications, activity, and aids used.

Stiens SA, Bergman SB, Goets LL. Neurogenic bowel dysfunction after spinal cord injury: clinical evaluation and rehabilitative management. *Arch Phys Med Rehabil*. 1997 Mar; 78 (3 Suppl): S86-102.

The most current systematic review of studies on neurogenic bowel management after spinal cord injury derives several key conclusions:

- * Often, more than one procedure is necessary to develop an effective bowel routine.
- * Evidence is low for non-pharmacological (conservative) interventions and high for pharmacological interventions.
- * Of the non-pharmacological interventions, transanal irrigation is a promising treatment to reduce constipation and fecal incontinence.
- * Of the non-pharmacological interventions, digital rectal stimulation, abdominal massage, and use of assistive devices such as standers and modified toilet seats is supported by lower levels of evidence.
- * When conservative management is not effective, pharmacological interventions (suppository and oral) are supported by strong evidence for treatment of chronic constipation.
- * When both conservative and pharmacological interventions are not effective, surgical interventions (implanted electrical stimulation and colostomy) may be considered and are supported by lower levels of evidence.
- * Multifaceted programs are the first approach to neurogenic bowel management and this is supported by lower level evidence.

Krassioukov A., Eng JJ., Claxton G., Sakakibara BM., Shum S., SCIRE Research Team. Neurogenic bowel management after spinal cord injury: a systematic review of the evidence. *Spinal Cord*. 2010. 48. 718-733.

Pathophysiology of Neurogenic Bowel

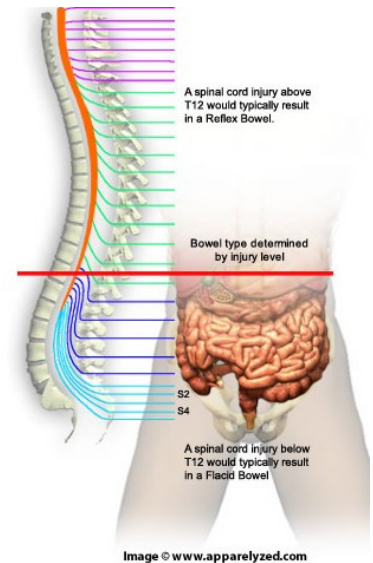
Control of bowel function is a combination of intrinsic and autonomic systems along with voluntary muscle control and sensation of bowels. Injuries disrupting the sensory awareness of rectal fullness, motor control of external sphincter and autonomic regulation of colonic peristalsis all result in some type of bowel dysfunction. The level of injury and neurological signs are key to understanding type of bowel dysfunction thus dictating which bowel care procedure will most likely be successful.

The cauda equina, conus medularis and sacral nerves are located at the approximate bony level of T11-T12.^{7,8,9}

Upper motor neuron injuries, levels above the sacral segments (S2-4), result in a **reflex bowel**. Voluntary control of the anal sphincter is lost, however resting tone allows anal sphincter to remain closed and prevent stool incontinence. The sacral reflex between the spinal cord and the colon remains intact, thus defecation is possible by triggering the anorectal colonic reflex (relaxation of the anal sphincter and rectal contraction). This reflex combined with digital rectal stimulation and pharmacological stimulants result in bowel evacuation. The goal is for stool consistency that is soft and formed to allow for easy evacuation.^{7,8,9}

Lower motor neuron injuries, levels disrupting the sacral segments or cauda equina, result in an **areflexic bowel**. The external anal sphincter demonstrates low tone or flaccidity and the sacral reflex arc is absent. There is greater risk for fecal incontinence as a result of the low tone sphincter and sluggish stool movement leads to drier, more rounded shape stool. The

goal is for stool consistency that is firmly formed and easily evacuated but remains in colon to prevent incontinence.^{7,8,9}



Reflex Bowel Function	Areflexic Bowel Function (Flaccid)
Intact Anal Reflex (anal wink) Visible contraction of anus in response to pin-prick of surrounding skin	Absent anal reflex (anal wink)
Intact Bulbo-Anal Reflex Contraction of anus in response to pressure on glans penis or clitoris	Absent bulbo-anal reflex
Injury level usually above T12 Presence of spasticity	Injury usually L1 and below (cauda equina, conus) Flaccid or hypotonic below level of lesion

Components of Bowel Program

A bowel program is comprised of the following:

- **Diet & Fluid**

- Goal of controlling diet is to manage the consistency of stool.
- Review diet to learn foods that cause GI irritation, constipation or loose stool.
- Dietary fiber can be added to help bulk up stool, however, it is important to encourage increased fluid intake to prevent dehydration.
- Staying hydrated leads to stool that is not too hard.

- **Activity & Exercise**

- Staying active and mobile helps to move the intestines, thus stimulating peristalsis.

- **Medications**

- Includes oral and rectal pharmacological stimulants.

- **Bowel Care**

- Procedure for initiating defecation.
- Schedule is based on individual's daily routine and natural bowel habits.
- UMN bowel utilizes digital stimulation to reflexively empty the colon and rectal mucosa stimulated medications.
- LMN bowel utilizes manual evacuation to empty rectum in combination with oral medications.
- Adjunctive techniques can include abdominal massage, change in position such as push ups and forward bending.
- Frequency is dependent on input and level of injury. UMN every day to every other day and LMN daily or BID.

Bowel Care Procedure

Reflexic Bowel Care

- Oral stimulant taken 8-12 hours prior, if necessary.
- Insert rectal chemical stimulant (suppository/mini-enema).
- Wait for stimulant to take effect (5-15 min).
- Perform digital stimulation to trigger anorectal colonic reflex (x20-60 sec).
Digital stimulation = insertion of a lubricated gloved finger into the rectum followed by slow gentle rotation and pressure on inner rectum in a circular manner to facilitate relaxation of anal sphincter and reflex peristaltic waves of colon.
- Additional assistive techniques may also be added here, such as: abdominal massage, forward/side bending to increase abdominal pressure, push up to change position of colon.
- Repeat stimulation until complete evacuation occurs (every 3-10 min).

Once an effective bowel program is established, may reduce chemical stimulants and simplify program if no resultant incontinent episodes occur for at least one week.^{9, 10}

Areflexic Bowel Care

- Oral stimulant taken 8-12 hours prior, if necessary.
- Perform manual evacuation to clear stool from rectum.
- Can be combined with gentle Valsalva maneuver.
- Manual evacuation = insertion of a lubricated gloved finger into rectum to grab stool and manually remove it.
- Frequency is generally every day and sometimes twice a day dependent on diet and liquids.^{9, 10}

Definition of Success

Person Centered Goals of a Successful Bowel Program

- Individualized program that is patient centered
- Facilitate predictable bowel movements
- Minimize time spent performing bowel care
- Minimize secondary complications
- Optimize comfort, safety, privacy and dignity
- Minimize physical and pharmacological interventions to maximize safety and independence
- Patient education so they may manage and adapt their bowel program over their life span

Surgical Interventions

Use of conservative treatments remains the gold standard for bowel management after SCI and is successful in 67% of persons with SCI.¹ However, when concerted efforts fail to improve insurmountable problems that ruin quality of life such as incontinence and very prolonged bowel care, surgical procedures may present a positive alternative. Two procedures individuals may consider are the Malone Antegrade Continence Enema and a colostomy.

The Malone Antegrade Continence Enema (MACE) procedure brings the appendix through the abdominal wall and cuts off the tip to provide an ostomy for catheterization. Irrigation is performed with 200 cc to trigger peristalsis which is followed with bowel care using digital stimulation to advance colon contents and trigger release of stool from the rectum.²

Colostomy is planned in combination with stool transit studies, colonoscopy and interdisciplinary input on ostomy location and choice of collection appliance. Therapists may evaluate a patient's functional mobility and clothing management with the bag in place to assess the potential impact on appearance and function. The patient is sent to the operating room with a cooperatively located X on the preferred ostomy location. In patients with incontinence and prolonged bowel care times colostomy very significantly reduces symptoms and improves quality of life, community reintegration and personal relationships.

New Innovations - Transanal Irrigation

Conservative management of neurogenic bowel after SCI has long been the standard of care. Conservative techniques include use of enemas and rectal stimulant medication coupled with digital stimulation to promote evacuation. An innovative method under investigation is the use of transanal irrigation (TAI), a system designed to introduce water into the colon and rectum to facilitate evacuation of fecal matter. This concept was designed to enable independent self administration of a retrograde tap water enema. A rectal catheter that has a water activated lubricant coating is advanced into the rectum by the patient and a retention balloon is inflated. A control unit switch then directs approximately 200cc of room temperature tap water which is gently into the rectum. The fluid distention and mucosal stimulation triggers reflex defecation. The retention balloon is deflated and defecation starts.

Medical studies suggest that a larger amount of stool is evacuated, there is a savings in caregiver time, and an improvement in quality of life. (cont on page 6)

New Innovation Cont.

The first published literature review on TAI was in 2010 and reviewed 23 studies utilizing TAI. Of those related to SCI, TAI was shown to have positive results for reduced time spent on bowel management, improved quality of life and low frequency of adverse events. Emmanuel A., Review of the efficacy and safety of transanal irrigation for neurogenic bowel dysfunction. *Spinal Cord* 2010; 48: 664-673.

Equipment for Bowel Care

For persons with tetraplegia, the average annual healthcare cost attributable to SCI for the first year of injury exceeds \$700,000 and increases to over \$100,000 in subsequent years. One variable that contributes to these costs is the occurrence and expense associated with the development of pressure sores.³ It is well known that a contributing factor that influences the development of pressure sores is the decreased independence and efficacy of bowel, bladder and bathing management after SCI. The majority of persons with SCI use adaptive aids or durable medical equipment (DME) to increase their ability to perform bowel, bladder and bathing functions. For these reasons, it is imperative that clinicians who recommend and prescribe equipment are well versed in the considerations for choosing specific pieces of equipment to maximally promote health and quality of life.⁴

Goal of Equipment:

- Easy and independent transfer
- Stable sitting surface
- Protects skin
- Facilitates upright sitting position (allows gravity to facilitate evacuation process)

Factors Which May Impact Equipment Purchase:

- Stewardship of limited healthcare dollars
- Consideration for equipment which may not be covered by insurance
- Weight limits
- Reduction of transfers required to complete all aspects of bowel, bladder and bathing management
- Travel and portability

Considerations for DME

Toilet Seat	<ul style="list-style-type: none"> ○ Padded vs. non padded ○ Commode cutout & direction ○ Adjustable seat depth ○ Reach access and under seat frame design ○ Arm support: fixed vs removable for transfers ○ If drop arm, ease to engage release mechanism ○ Back support, is it removable ○ Frame design to fit around toilet ○ Suction cups
Tub Bench	<ul style="list-style-type: none"> ○ Bench extension supported on tub ledge vs. outside tub ○ Padded vs. non padded ○ Commode cutout vs. no cutout ○ Shape and direction of commode cutout ○ With or without bucket attachment ○ Backrest style: rigid vs. sling/material ○ Side arm available ○ Suction cups: none, 2 or 4 ○ Ease to change from L or R side ○ Seatbelt and/or chest strap ○ Portability ○ Versatility to function for bathing/toileting ○ Garden tub: leg height and seat width
Multipurpose / Modular System	<ul style="list-style-type: none"> ○ May function as: <ul style="list-style-type: none"> ○ Toilet chair ○ Shower chair ○ Tub bench ○ Considerations and options may include: <ul style="list-style-type: none"> ○ Stationary or mobile ○ Same as for toilet and tub ○ Transfer bench extension available ○ Carrying case included
Roll-in Shower Commode Chair	<ul style="list-style-type: none"> ○ Seat: padding, shape (pressure, access, transfers), adjustability (depth, back:seat angle, dump), back rest (contoured, padded, upholstery) ○ Arm support: padded, locks in place, swing away, height adjustable) ○ Foot support: height adjustable, hanger angle, removable/swing away/fixed, heel/calf loops ○ Brakes: accessible, easy engage/disengage, push or pull to lock ○ Ability to self propel: tire size, tire type, push rim diameter/coating/projections ○ Floor--seat height: adjustable, effect on perineal access over toilet, effect on transfers ○ Portability and bathroom accessibility: folding design, quick release wheels, interchangeable wheels with casters, tilt vs. recline, elevating leg rests

Comparing Roll-In Shower/Commode Chairs

Since no single style of equipment meets the needs for all patients, it may be helpful to compare individual characteristics for differing pieces of equipment.

This sample chart can be used as a tool for clinicians when comparing and contrasting various brands and models of DME for toileting. For example, in my review of "Brand" A shower chair, I considered their seat padding fair as compared to "Brand" B, which I considered to be good. Each Brand of equipment should be considered based on these key characteristics.

Considerations	"Brand" A	"Brand" B
Flexibility to change seat shape, size, angle, depth	Good	Fair
Seat padding	Fair	Good
Seat shape for hand placement during transfers	Good	Good
Armrest style	Fair	Poor
Footrest style	Poor	Poor
Brake accessibility and effectiveness	Good	Good
Bowel program accessibility	Fair	Good
Ability to self propel	Poor	Poor
Seat to floor height inches or adjustable	22"	18"-22"
Durability	Good	Good

References and Resources

Listed below are common equipment brands utilized in the rehabilitation setting. Each has its advantages and disadvantages when considering which piece of equipment meets the unique needs for your patient. More detailed information on each can be found on their website by clicking on the hyperlink.

Roll-in shower commode chairs & Modular systems

- Activeaid activeaid.com
- Go Mobility Goesanywhere.com
- NuProdux www.nuprodx.com
- RAZ Designs www.razdesigninc.com
- Shower Buddy www.myshowerbuddy.com

Suppository inserters and digital stimulators

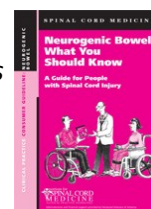
- North coast medical www.ncmedical.com
- Patterson medical www.pattersonmedical.com

1. Krassioukov A, Eng J, Claxton G, Sakakibara B, Shum S, SCIRE Research Team. Neurogenic bowel management after spinal cord injury: a systematic review of the evidence. *Spinal Cord*. 2010. 48. 718-733.
2. Interview with Dr. Steven A Stiens MD MS, Associate Professor, Department of Rehabilitation Medicine, University of Washington, Attending Physician, SCI unit, VA Puget Sound Health Care System, Steven.Stiens@va.gov.
3. SCI Facts and Figures at a Glance Feb 2012; www.NSCISC.uab.edu
4. McKinley W, Jackson A, Cardenas D, DeVivo M. Long-Term Medical Complications After Traumatic Spinal cord Injury: A Regional Model Systems Analysis. *Arch Phys Med Rehabil* Vol 80, November 1999. 1402-1410.

5. Hammond M, Burns S. Yes, You Can! A Guide to Self-Care for Persons with Spinal Cord Injury. 3rd ed. Paralyzed Veterans of America: Library of Congress Catalog-in-Publication Data, 2000.
6. Munro B. After and Beyond Spinal Cord Injury Resource Manual. 3rd ed. Ontario: Canadian Spinal Research Organization.
7. Lin V. Spinal Cord Medicine Principles and Practice. In: Stiens S, Singal A, Korsten M, eds. *The Gastrointestinal System After Spinal Cord Injury: Assessment and Intervention*. 2nd ed. Demos Medical Publishing, 382-408.
8. Somers M. Spinal Cord Injury Functional Rehabilitation. 3rd ed. Boston: Pearson, 2010.
9. Consortium of Spinal Cord Medicine Clinical Practice Guidelines. Neurogenic Bowel: What You Should Know. Paralyzed Veterans of America.
10. Guidelines for Management of Neurogenic Bowel Dysfunction after Spinal Cord Injury. Produced by the Spinal Cord Injury Centres of the United Kingdom and Ireland. 2009

Clinical practice guidelines published by Paralyzed Veterans of America are available for free download at www.pva.org

- *Neurogenic Bowel Management in Adults with Spinal Cord Injury*
Consumer guidelines also available for free download at www.pva.org
- *Neurogenic Bowel: What You Should Know*



Assessment Tools








Below is a chart which can be printed and provided to individuals as a means to track their bowel habits.

Bowel Diary

Date	Start Time	Position	Medications & Stimulation Method (stool softeners, laxatives, suppository, mini-enema, digital stimulation)	Assistive Techniques Used (abdominal massage, push up, valsalva)	Completion Time (start to finish)	Stool Results (amount, lack of result, type – see Bristol Scale)	Unplanned Bowel Movement (time of day, # episodes)	Comments (change to program, change in diet, rectal bleeding, abdominal cramps, pain, muscle spasm, etc.)
4/1/13	6:30 am	L sidelying	Senna 30mg at night Bisacodyl Suppository	None	1 hr 20 min	Large amount Type 2	1 After lunch	Indian food for dinner yesterday

Adapted from Clinical Practice Guidelines.⁹

Bristol Stool Chart

<p>Type 1  Separate hard lumps, like nuts (hard to pass)</p>	<p>Type 5  Soft blobs with clear-cut edges (passed easily)</p>
<p>Type 2  Sausage-shaped but lumpy</p>	<p>Type 6  Fluffy pieces with ragged edges, a mushy stool</p>
<p>Type 3  Like a sausage but with cracks on its surface</p>	<p>Type 7  Watery, no solid pieces. Entirely Liquid</p>
<p>Type 4  Like a sausage or snake, smooth and soft</p>	

Food Group	Foods That Harden Stool	Foods That Soften Stool
Fruits & Vegetables	Strained fruit juice, Apple sauce, Potatoes without skins	Fruits and vegetables, Fruit juice with pulp, Dried fruits (prunes, raisins, apricots)
Bread & Cereal	Enriched white bread, Saltine crackers, Refined cereal, Pancakes, Waffles, Bagels, Biscuits, White Rice, Enriched noodles	Whole grain breads and cereals
Dairy Products	Milk, Yogurt without fruit, Cheese, Cottage Cheese, Ice Cream	Yogurt with seeds or fruit, Buttermilk
Meats & Legumes	Any meat, fish or poultry	Nuts, Dried beans, Peas, Seeds, Lentils, Chunky peanut butter
Soup	Creamed or broth based without vegetables, beans or lentils	Soups with vegetables, beans or lentils
Fat	None	All
Desserts & Sweets	Those without seeds or fruits	Those made with cracked wheat, seeds or fruits

5, 6

Common Pharmacological Agents for Neurogenic Bowel	Onset of Action	Common Side Effects
Oral Laxatives – Stimulants		
Increase peristalsis (contractions in colon) to move stool faster through the bowel and keep it soft		
Bisacodyl	6 – 12 hrs	Abdominal cramps, Diarrhea, Dehydration. Senna may discolor urine and feces.
Senna	6 – 12 hrs	
Oral Laxatives – Stool Softeners		
Help stool retain fluid, stay soft and slide through the colon		
Docusate Sodium (DOS)	12 – 72 hrs	Loose stool, Incontinence
Oral Laxatives – Bulk-Forming		
Add bulk to stool to hold water for easier movement of stool through bowels		
Methylcellulose	12 - 72 hrs	Bloating, Flatulence, Impaction resulting in diarrhea
Calcium Polycarbophil	12 - 72 hrs	
Psyllium	12 – 72 hrs	
Oral Laxatives—Osmotics		
Milk of Magnesia	30 min - 3 hrs	Abdominal cramping, Bloating, Diarrhea
Miralax	30 min - 3 hrs	
Rectal Stimulants - Suppositories		
Bisacodyl Dulcolax (vegetable oil base) Magic Bullet (polyethylene glycol base)	Increases colon activity by stimulating the nerves in the lining of rectum	Local irritation
Glycerin	Stimulates peristalsis in colon and lubricates rectum to help pass stool	
Rectal Stimulants – Enemas		
Mini-Enema	Stimulates the rectal lining and softens stool	Local irritation, rectal trauma.

7, 8, 9