Neurogenic Bowel Dysfunction Management after SCI
New Clinical Practice Guidelines

Jeffery S. Johns, M.D.
Gianna Rodriguez, M.D.
Wilda Montero-Colon, DNP, MSN, CRRN
Disclosures

The presenters have no financial or non-financial interests to disclose.

This continuing education activity is managed and accredited by AffinityCE in cooperation with PVA. AffinityCE, PVA, as well as all accrediting organizations, do not support or endorse any product or service mentioned in this activity. Disclosure will be made when a product is discussed for an unapproved use.

AffinityCE staff and PVA Staff, as well as Planners and Reviewers, have no relevant financial or non-financial interests to disclose.

This work was funded by PVA through a Craig H. Neilsen Foundation grant and developed with oversight by the Consortium of Spinal Cord Medicine.
Learning Outcomes

At the conclusion of this activity, the participant will be able to:

1. describe the components of a basic bowel management program
2. outline the appropriate equipment needed to optimize bowel program efficacy, patient safety and independence
3. review the key complications that may occur as a result of neurogenic bowel and/or its management
Panel Members

- Jeffery Johns, MD
  - Panel Chair
- Janice Eng, PhD, PT
- Emily Haller, MS, RDN
- Malorie Heinen, BSN, RN
- Mark Korsten, MD
- Klaus Krogh, MD, PhD, DMSc
- Rafferty Laredo, OTR, MA
- Walter Longo, MD, MBA
- Wilda Montero-Colon, DNP, MSN, CRRN
- Gianna Rodriguez, MD
- Catherine Wilson, PsyD, ABPP(RP)
Guidelines Development Process

- Create formal list of key questions to be addressed
- Systematic searches of published literature related to those key questions
- Critical appraisal of the quality of the retrieved studies
- Abstraction of relevant study results
- Creation of evidence-based recommendations
- Development of rationale that explain the recommendations
- Review and agreement by panel members
- Field and legal reviews
NBD CPG Timeline

• Dr. Johns accepted invite to be Panel Chair
  • Dec 2017

• Panel members identified and invited
  • Jan-Feb 2018

• Initial Panel teleconference
  • April 2018

• Key Questions Finalized
  • Spring 2018

• Evidence Tables finalized by SCIRE Project Team
  • August 2018

• Panel Face to Face Meeting
  – CPG Structure
  – Writing assignments
    • August 2018

• First Draft
  • Jan 2019
NBD CPG Timeline

• 2\textsuperscript{nd} Face to Face Meeting
  – Compose and Rate Recommendations
    • Feb 2019
• Editing process
  – Medical editor
  – Panel members
    • Spring 2019

• Field and Expert Reviewers
  – Summer 2019
• Share preliminary recommendations
  – PVA Summit
    • August 2019
  – ASCIP Annual Conference
    • September 2019
Literature Search

- 1980- June 2018
- Multiple databases and hand searches of reference lists in studies and reviews
- 5603 records screened
- 333 studies included
  - 15 RCTs
  - 24 Prospective controlled/longitudinal
  - 13 case-control
  - 44 pre-post
  - 237 cross-sectional studies
Levels of Scientific Evidence

I. Evidence based on randomized controlled trials (or meta-analysis of such trials) of adequate size to ensure a low risk of incorporating false-positive or false-negative results.

II. Evidence based on randomized controlled trials that are too small to provide level I evidence. With a high risk of false-negative results.
Levels of Scientific Evidence

III. Evidence based on nonrandomized, controlled, or cohort studies; case series; case-controlled studies; or cross-sectional studies

IV. Evidence based on the opinion of respected authorities or expert committees as indicated in published consensus conferences or guidelines

V. Evidence that expresses the opinion of those individuals who have written and reviewed this guideline, based on experience, knowledge of the relevant literature, and discussions with peers
Strength of Evidence

A. The guideline recommendation is supported by one or more level I studies.

B. The guideline recommendation is supported by one or more level II studies.

C. The guideline recommendation is supported by one or more level III, IV or V studies.
## Level of Panel Agreement

<table>
<thead>
<tr>
<th>Level</th>
<th>Mean Agreement Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1.0 to less than 2.33</td>
</tr>
<tr>
<td>Moderate</td>
<td>2.33 to less than 3.87</td>
</tr>
<tr>
<td>Strong</td>
<td>3.87 to 5.0</td>
</tr>
</tbody>
</table>
1. SCREENING AND CLASSIFICATIONS
1.1 Define the level and completeness of spinal cord injury (SCI) according to the current International Standards for Neurological Classification of Spinal Cord Injury (ISNCSCI) scale.

- Level of Evidence
  - IV
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
1.1 Define the level and completeness of spinal cord injury (SCI) according to the current International Standards for Neurological Classification of Spinal Cord Injury (ISNCSCI) scale.

- Must know this to establish what type of Neurogenic Bowel Dysfunction (NBD) an individual is likely to have.

- Lower Motor Neuron (LMN) NBD
  - Areflexic bowel
  - Results from lesion of
    - Cauda equina
    - Conus medullaris
    - Pelvic Nerves
1.1 Define the level and completeness of spinal cord injury (SCI) according to the current International Standards for Neurological Classification of Spinal Cord Injury (ISNCSCI) scale.

- Upper Motor Neuron (UMN) NBD
  - Reflexic bowel
  - Results from lesions above the conus medullaris

- Provider should also assess other physical exam aspects:
  - Sacral reflexes
  - Pelvic floor tone and function
1.2 A systematic comprehensive evaluation of bowel function, impairment, and possible problems should be completed at the onset of SCI and at least annually throughout the continuum of care.

- Level of Evidence
  - V

- Strength of Evidence
  - C

- Level of Panel Agreement with the Recommendation
  - Strong
1.2 – Comprehensive evaluation

• Symptoms of NBD often underestimated without standardized questionnaires.
  – Several have been developed and assess different aspects of NBD, but none are universally accepted.
1.3 The International SCI Bowel Function Basic Data Set, a standardized assessment tool that has been validated for individuals with SCI, is recommended.

- Level of Evidence
  - V
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
1.3 – International SCI Bowel Function Basic Data Set

- **Version 2.0**
  - Developed by international group of NBD experts
  - Endorsed by ASIA and ISCoS
  - Developed from work described in the International SCI Bowel Function Basic and Extended Data Sets
- **16 items**
  - Background info on bowel function
  - Details of NBD and bowel management
- **Includes NBD score**
  - 10 items that describe bowel function
  - Used for group comparisons rather than clinical decisions
### International SCI Bowel Function Basic Data Set

**Frequency of defecation (within the last four weeks):**
- Daily
- 1-6 times per week
- Less than once per week
- Not applicable
- Unknown

**Uncomfort, headache or perspiration during defecation (within the last four weeks):**
- No
- Yes
- Unknown

**Digital stimulation or evacuation of the anorectum (within the last four weeks):**
- Daily
- 1-6 times per week
- Less than once per week
- Never
- Not applicable
- Unknown

**Frequency of fecal incontinence (within the last four weeks):**
- Daily
- 1-6 times every month
- Less than once per month/never
- Not applicable
- Unknown

**Flatus incontinence (within the last four weeks):**
- No
- Yes
- Not applicable
- Unknown

**Need to wear diaper, pad or plug (within the last four weeks):**
- No
- Yes
- Not applicable
- Unknown

**Oral laxatives (within the last four weeks):**
- No
- Yes, crops or liquids
- Bulking/Osmotic
- Enema
- No tablets, capsules or granules
- Other
- Unknown

**Constipating agents/drugs against fecal incontinence (within the last four weeks):**
- No
- Yes
- Unknown

**Perianal problems (within the last four weeks):**
- No
- Yes

**Hemorrhoids**
- Perianal sores
- Fissures
- Other, specify
- Unknown

**Abdominal pain or discomfort (within the last four weeks):**
- Daily
- 1-6 times per week
- Less than once per week
- Never
- Unknown

**Total NBD Score (optional and only applicable for adult persons):**

*Interpretation of the NBD score: 0-6 Very minor, 7-9 Minor, 10-13 Moderate and 14 or more Severe neurogenic bowel dysfunction.*
1.4 The Bristol Stool Form Scale can be used for assessment of stool consistency.

- Level of Evidence
  - IV
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong

Describes stool consistency: 1 (hard) to 7 (watery)
Corresponds to colonic transit time in able-bodied individuals
Not validated in NBD
1.5 The Bowel Management subscale of the Spinal Cord Injury-Quality of Life (SCI-QOL) measurement system can be used for assessment of the impact of neurogenic bowel dysfunction (NBD) on daily living and quality of life (QOL).

- Level of Evidence
  - III
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
1.5 – Spinal Cord Injury-Quality of Life (SCI-QOL) measurement system

- Item bank of 26 questions developed and thoroughly validated in a large population of American individuals with SCI.
- Items include assessment of specific symptoms of NBD, as well as their impact on daily living and QOL.
- Items do not add to a total score.
2. ASSESSMENT/OUTCOME MEASURES FOR NEUROGENIC BOWEL DYSFUNCTION
PHYSICAL EXAMINATION
A physical examination should be done at the onset of SCI, annually, and upon any significant change in bowel function or in health.

**Abdominal examination**

- signs of malnutrition and dehydration
  - distention, hernias, and other abnormalities

- auscultation of bowel sounds and percussion
  - constipation, obstruction, or pseudo-obstruction - tympanitic and hypoactive abdomen

- abdominal palpation
  - inspecting for pain, tenderness, discomfort; masses, and other lesions.
Perineal inspection and rectal examination

- reveal fissures, hemorrhoids, and patulous anus, rectoceles, and rectal prolapse.
- sensation to light touch and pinprick around the anus/deep pressure – complete vs inc
- presence of bulbocavernosus reflex and anal wink
  - emergence from spinal shock
  - UMN bowel (lesion above T12) with preservation of reflexes
Perineal inspection and rectal examination

- sphincter tone at rest and with anal squeeze
  - voluntary anal squeeze indicates motor incompleteness AIS C
- simulated defecation with bearing down
  - muscle weakness or hypertonicity of the sphincter muscle and pelvic floor muscle
  - perineal descent while the patient individual strains
  - Paradoxical contraction of muscles suggests dyssynergia
DIAGNOSTIC TOOLS
Abdominal x-ray/computed tomography (CT)

- Extent of fecal loading, degree of stool retained in each colon segment; fecal impaction, obstruction
- Radiography can also be used to detect megacolon, megarectum, and fecal impaction
- CT scan of the abdomen - when further diagnostic testing is indicated
Colonic transit time testing with radiopaque markers or scintigraphy can be used to provide more information on NBD.

- **Colonic transit testing** - ingestion of radiopaque markers serial abdominal x-rays to track the passage of the markers along the colon
Colonic transit time testing with radiopaque markers or scintigraphy can be used to provide more information on NBD.

Colonic Transit Time with Scintigraphy - radionuclide coated resin pellets x 2d

• Colonic transit time determined imaging at 24, 48, and 72 hours after the meal is eaten
Wireless motility capsule can be used to provide more information on NBD by evaluating gastric emptying time, small intestinal transit time, and colonic transit time.

A wireless motility capsule (SmartPill; SmartPill Corp., Buffalo, NY) -measures gastric pH, segmental transit times (gastric, small int, colon) and total GI motility transit time.
Anorectal manometry can be used for detailed assessment of pelvic floor dysfunction in motor incomplete SCI.

- dyssynergic defecation, pelvic flor dyssynergia, or obstructive defecation.
- discoordination between the abdominal, pelvic, rectal, and sphincter muscles
  - deficient propulsive forces
  - increased resistance to evacuation with high rectal pressures
  - paradoxical contraction of the pelvic floor and sphincter muscles
  - poor muscle relaxation during attempts at defecation.
Defecography is recommended by the AGA and ACG when the ARM and balloon expulsion test is inconclusive.

- barium instilled in the anorectum under fluoroscopy or MRI for dynamic evaluation before, during, and after attempted defecation.

- anatomic causes of outlet obstruction such as rectal prolapse, rectocele, or enterocoele can be identified
3. BASIC BOWEL MANAGEMENT
3.1 A basic bowel management (BBM) program should be used in individuals with both upper motor neuron (UMN) and lower motor neuron (LMN) injuries.

- Level of Evidence
  - III
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
3.1 A basic bowel management (BBM) program should be used in individuals with both upper motor neuron (UMN) and lower motor neuron (LMN) injuries.

- For both types of NBD, bowel programs are designed to establish predictable and effective bowel continence and evacuation after SCI.

- BBM is indicated as first-line treatment for all individuals with SCI diagnosed with NBD who do not require surgical intervention due to the severity of the case or secondary complications.
3.2 For most individuals, a minimum of 3 adequate bowel movements per week is recommended. However, the individual’s lifestyle and premorbid bowel history should be considered.

- Level of Evidence
  - IV
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
3.2 For most individuals, a minimum of 3 adequate bowel movements per week is recommended. However, the individual’s lifestyle and premorbid bowel history should be considered.

- For reflexic or areflexic bowels, recommendations are for daily bowel programs, or at least 3x per week
- Consider: neurological level of the SCI, type of NBD, premorbid bowel function, diet, caregiver support, manual dexterity, and needs of the individual with SCI

- Physical assessment: positioning of the individual for the bowel program on the basis of level of injury, sitting balance, and functional skills.
3.2 For most individuals, a minimum of 3 adequate bowel movements per week is recommended. However, the individual’s lifestyle and premorbid bowel history should be considered.

- The individual or caregiver should perform bowel care at the same time daily.
- Consider the individual’s preinjury bowel evacuation routine and the availability of assistance with a bowel program.
- Individuals with SCI and/or their caregivers should keep a log of how the bowel program is going and record any complications.
3.3 Digital rectal stimulation (DRS) should be used for individuals with an upper motor neuron (UMN) NBD.

- Level of Evidence
  - III

- Strength of Evidence
  - C

- Level of Panel Agreement with the Recommendation
  - Strong
3.3 Digital rectal stimulation (DRS) should be used for individuals with an upper motor neuron (UMN) NBD.

- DRS is used to trigger rectocolic and rectoanal reflexes to increase motility and relax sphincters in UMN injuries
- 15.5% to 72% of individuals with SCI
- Caution is advised when using DRS in an individual who is at risk for AD.
3.4 Manual evacuation of stool should be used for individuals with a lower motor neuron (LMN) NBD.

- Level of Evidence
  - III
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
3.4 Manual evacuation of stool should be used for individuals with a lower motor neuron (LMN) NBD.

- Manual evacuation of stool is indicated as treatment for LMN bowel management
- 29.8% to 56% of individuals with SCI using it
- Manual evacuation is performed with the individual side-lying in bed, or positioned on a padded commode if prescribed to be performed in an upright position.
- Caution is advised when using manual evacuation for an individual who is at risk for AD.
3.5 Abdominal massage should not be used for neurogenic bowel emptying.

- Level of Evidence
  - III
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
3.5 Abdominal massage should NOT be used for neurogenic bowel emptying.

- No specific indications or contraindications have been found for abdominal massage.
- Very low level of evidence supports the use of abdominal massage for treatment of NBD for SCI because studies performed have been observational with no RCTs.
- Individuals with cervical SCI reported hemorrhoids and abdominal pain.
- Given the increased risk of complications, along with unclear documented benefits, it is recommended that this technique not be used routinely in the management of NBD.
3.6 The Valsalva maneuver should not be used for neurogenic bowel emptying.

- Level of Evidence
  - V
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
3.6 The Valsalva maneuver should NOT be used for neurogenic bowel emptying.

- Very low level of evidence: single cross-sectional study that suggests that those who use the Valsalva maneuver have a higher rate of rectal abscess and a lower rate of hemorrhoids than do those who use DRS and manual evacuation (Menter et al., 1998).
- Expert opinions indicate that this maneuver should not be used in LMN (MASCIP 2012).
4. DIET, SUPPLEMENTS, FIBER, FLUIDS, AND PROBIOTICS
4.1 Providers should inquire about and document diet history, including all dietary supplements that an individual is taking.

- Level of Evidence
  - V
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
4.1 Providers should inquire about and document diet history, including all dietary supplements that an individual is taking.

- Greater use of dietary supplements in the SCI population has been well documented.
- There is limited information available on the clinical effectiveness of dietary supplement use for NBD in SCI.
- There can be complications related to supplementation, mainly that of related to toxicity.
4.2 Providers should refer to a registered dietitian if the individual has poor appetite, poor oral intake, or significant weight changes.

- Level of Evidence
  - V
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
4.2 Providers should refer to a registered dietitian if the individual has poor appetite, poor oral intake, or significant weight changes.

- Individuals with SCI who are in the acute phase, in a rehabilitation setting, or in a community setting may experience unintentional weight gain or weight loss due to:
  - varying energy needs
  - appetite
  - food choices and availability.
- Medical nutrition therapy provided to individuals with SCI by a registered dietitian has been shown to improve nutrition-related patient outcomes.
  - adequate nutrient intake
  - management of serum lipids
  - weight
  - dysphagia
  - bowel function
  - pressure ulcers
4.3 Providers should supplement an individual with SCI who has a nutritional deficiency with the appropriate vitamin, mineral, and/or protein supplement.

• Level of Evidence
  – V
• Strength of Evidence
  – C
• Level of Panel Agreement with the Recommendation
  – Strong
4.3 Providers should supplement an individual with SCI who has a nutritional deficiency with the appropriate vitamin, mineral, and/or protein supplement.

- Vitamin, mineral, and protein supplements for NBD, to prevent and correct nutrient deficiencies in individuals with SCI is essential for optimal long-term health.
- Pressure ulcers
  - Adequate Nutrition (calories and micronutrients)
  - Fluids
  - Protein supplementation
  - Multivitamin/Minerals
- Vitamin D insufficiency
  - Vitamin D supplementation
4.4 Individuals with SCI should not be uniformly placed on high-fiber diets. Increases in fiber intake from food or a supplement should be done gradually to assess tolerance.

- Level of Evidence
  - III
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
4.4 Individuals with SCI should not be uniformly placed on high-fiber diets. Increases in fiber intake from food or a supplement should be done gradually to assess tolerance.

- Specific fiber supplements have been shown to be effective for those with constipation in the general population.
- Fiber intake from food and fiber supplements should be assessed in individuals with SCI, as interventions to alter the quantity or type of fiber can be used to influence bowel management.
- A diet history should be taken to determine an individual’s usual, or baseline, fiber intake from food and fiber supplements.
- Increases in fiber intake from food or a supplement should be done gradually to assess tolerance and to avoid undesirable side effects from increasing fiber too quickly.
- If symptoms of intolerance occur, a reduction or change in the type of fiber being used is recommended.
4.5 Foods that cause an individual with SCI to experience excessive flatulence, bloating, abdominal distension, and/or altered bowel movements should be identified and either limited or avoided.

- Level of Evidence
  - V
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
4.5 Foods that cause an individual with SCI to experience excessive flatulence, bloating, abdominal distension, and/or altered bowel movements should be identified and either limited or avoided.

- Certain foods increase gas production, which may increase or influence GI symptoms in individuals with SCI.
- The use of a diet that is low in Fermentable, Oligosaccharides, Disaccharides, Monosaccharides, and Polyols (FODMAPs) may be useful for improving GI symptoms, particularly in individuals with SCI who had Irritable Bowel Syndrome (IBS) prior to injury.
4.6 Providers should recommend an individual with SCI maintain euhydration and avoid dehydration to reduce the tendency to experience constipation. The amount of fluid needed to promote optimal stool consistency must be balanced with the amount needed for bladder management.

- Level of Evidence
  - V
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
4.6 Providers should recommend an individual with SCI maintain euhydration and avoid dehydration to reduce the tendency to experience constipation. The amount of fluid needed to promote optimal stool consistency must be balanced with the amount needed for bladder management.

- Increasing fluid intake to improve constipation has been shown to benefit individuals who were in a hypohydrated state, with minimal efficacy demonstrated in a euhydrated state (Arnaud, 2003).
- General population guidelines published by the Association of Rehabilitation Nursing Nurses association suggest including 2 liters of fluids per day for people with constipation (Folden et al., 2002).
4.7 Providers should not routinely recommend probiotics to an individual with SCI.

- Level of Evidence
  - V
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
4.8 Probiotics may be advantageous to an individual with SCI who is taking antibiotics by reducing antibiotic-associated diarrhea and Clostridium difficile-associated diarrhea (CDAD).

- Level of Evidence
  - I
- Strength of Evidence
  - A
- Level of Panel Agreement with the Recommendation
  - Strong
Probiotics

4.7 & 4.8 Probiotics

- Probiotics are not routinely recommended.
- Probiotics can be beneficial in individuals with SCI on antibiotics for the prevention of antibiotic-associated diarrhea (AAD) and Clostridium difficile-associated diarrhea (CDAD).
5. MEDICATIONS
Providers can use oral medications for bowel management; however, the evidence is limited and there are no data to suggest the use of one medication over another.

- Management of NBD involves a hierarchical approach to a personalized bowel routine that aims to achieve regular, consistent, predictable bowel movements with adequate stool evacuation, no episodes of incontinence, and prevention of GI and perianal problems.
Basic bowel care begins with conservative therapy that includes a combination of oral stimulants and/or medications and rectal laxatives (e.g., suppositories, mini enemas), coupled with mechanical strategies such as DRS or digital evacuation of stool.
Medications

The American Gastroenterological Association Medical Position Statement on Constipation recommendations for treatment of normal or slow-transit constipation

• minimizing medications that are constipating (opiates, anticholinergics, etc.)
• gradually increase dietary fiber or supplemental fiber intake
• osmotic agent (Milk of Magnesia or PEG)
Medications

• stimulant (senna, bisacodyl) 30 minutes after a meal to synergize the pharmacological agent with the gastrocolic response

• newer agents such as lubiprostone or linaclotide should be considered if there is insufficient or poor response to simple laxatives.

• prucalopride is also a good option, although it is not yet available in the United States.
Medications

• opiate-induced constipation - newer medications such as naloxegol, methylnaltrexone, and alvimopan are
  – peripherally acting μ-opioid receptor antagonists that selectively block μ-receptors outside the central nervous system and improve constipation without reversing analgesia or prompting opioid withdrawal
6. USE OF SUPPOSITORY, ENEMAS, AND IRRIGATION
Providers can use rectal medications for bowel management

- rectal medications are a key component of conservative bowel care for individuals with SCI who have reflexic bowel/UMN lesions (MASCIP 2012).

- rectal medications are currently one of the most commonly used bowel management

- can also be used as rectal irritants in the management of LMN areflexic bowels.
Chemical rectal irritants

- **Glycerine suppository** – facilitates defecation by acting as a lubricant and stimulating rectal contractions via local hyperosmotic activity and mild irritation.
Chemical rectal irritants

• **Bisacodyl suppository** - contact irritant that enhances gastric motility, increases fecal water content, and reduces transit time in the large intestine
  – 2 variants: hydrogenated vegetable oil based (e.g., Dulcolax) and PEG based (e.g., Magic Bullet)

• A polyethylene glycol (PEG)-based bisacodyl suppository is recommended over a hydrogenated vegetable oil-based bisacodyl suppository.
Chemical irritants

- **Docusate mini enemas** are recommended over glycerin, mineral oil, and vegetable oil-based bisacodyl suppositories.
- **Docusate sodium** is a stool softener that emulsifies fat in the intestines and reduces water reabsorption.

Enemeez - docusate sodium (283 mg) combined with glycerin in a PEG solution outperformed hydrogenated vegetable oil-based bisacodyl suppositories, but had comparatively similar results to PEG-based bisacodyl.
The routine use of enema formulations such as sodium phosphate (Phospho-Soda), soapsuds, or milk and molasses is not recommended; however, in select patients, their intermittent use for constipation in select patients may be helpful for constipation.
DEVICES
Transanal irrigation (TAI) is recommended in individuals with NBD who have insufficient results with basic bowel management

- Irrigation fluid is electrically or gravity pumped from a reservoir into the colon via a rectal cone or rectal catheter that has been inserted into the anus.
- Recommend performing TAI 20 to 30 minutes after a meal to take advantage of the gastrocolic reflex.
- Recommend TAI for individuals who are refractory to conservative methods.
Transanal irrigation (TAI) is recommended in individuals with NBD who have insufficient results with basic bowel management

- Evidence supports the success of TAI in treating constipation (40% to 63% of cases), fecal incontinence (47% to 72.7% of cases), and prolonged defecation time
- TAI improves symptom related QOL,
  - increased patient satisfaction and intestinal function
- TAI reduced or eliminated pharmaceutical use in 28.6% of
- TAI outperformed or matched conservative treatment in all parameters in a comparative RCT, although TAI is considered a second-line treatment for conservative bowel management
- computer-modeled cost analysis of TAI against conservative bowel management estimated significant lifetime financial savings
Transanal irrigation
Transanal irrigation (TAI) is recommended in individuals with NBD who have insufficient results with basic bowel management

• absolute contraindications for TAI: anal or rectal stenosis, active inflammatory bowel disease, acute diverticulitis, colorectal cancer, ischemic colitis, rectal surgery within 3 months, or endoscopic polypectomy within 4 weeks.

• relative contraindications - severe diverticulosis; dense sigmoid disease; history of diverticulitis, diverticular abscess, or rectal surgery; long-term steroid medication; fecal impactions; painful anal conditions; planned or current pregnancy; bleeding diathesis or anticoagulant therapy (except aspirin or clopidogrel); and severe AD
Pulsed irrigation evacuation (PIE) in a hospital/clinic setting can be used to relieve fecal impaction.

- involves widening of the anus with a lubricated speculum and the application of 5 mL/second pulses of tap water from a cuffed tube

- pulses are used for up to 1 minute until stool disimpaction or bowel peristalsis is triggered to assist evacuation

- treatment complete when anal outflow is clear with no visible fecal matter after evacuation.
Functional Magnetic Stimulation

Routine use of FMS for NBD is not recommended.
Functional Electrical Stimulation (FES)

Routine use of FES for NBD is not recommended.
9. SURGICAL INTERVENTION TO MANAGE NEUROGENIC BOWEL DYSFUNCTION
9.1 Colostomy is recommended for individuals with severe NBD for whom other treatment modalities have failed or who have had significant complications.

• Level of Evidence
  – III
• Strength of Evidence
  – C
• Level of Panel Agreement with the Recommendation
  – Strong
9.2 Colostomy can be a choice for individuals with NBD who prefer the option after thorough education regarding risks, benefits, and complications and after shared decision making with their providers.

- Level of Evidence
  - III
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
9.1 and 9.2 - Colostomy

- Compared to conservative bowel management
  - Equivalent or superior quality of life outcomes
- Decreases
  - time spent on bowel care
  - number of hospitalizations
- Improves
  - physical and psychosocial health
  - independence
- Higher satisfaction versus ileostomy
9.1 and 9.2 - Colostomy

- No consensus re: timing
  - Becomes a more favorable option with increasing age
- Include pre- and post-operative enterostomal therapist
- Paramount that individuals be well-informed of short- and long-term complications
  - Leakage of mucus from rectum
  - Stomal prolapse
  - Parastomal hernias
  - Bowel obstruction
9.3 Malone antegrade continence enema (MACE) procedures can be used for individuals with SCI with severe NBD for whom other treatment modalities have failed.

- Level of Evidence
  - III
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
9.4 The MACE procedure can be a choice for individuals with NBD who prefer the option after thorough education regarding risks, benefits, and complications and after shared decision making with their providers.

- Level of Evidence
  - III
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
9.3 and 9.4 - MACE

• Overall success (neuro disorders including SCI)
  – 75% and 85% at 38 and 75 months
• Surgical creation of entry through appendix attached to abdominal wall
  – Valve mechanism prevents leakage at stoma
• Catheter inserted
• Enema administered through catheter to irrigate colon and rectum
9.3 and 9.4 - MACE

• Compared with colostomy
  – Reduced complication rates
  – Less incidence of AD
  – No need for appliance to collect waste
  – Less odor

• Complications
  – Wound infections
  – Bowel obstructions
  – Stomal stenosis

• Need experienced surgeon to minimize complications
10. MANAGING COMPLICATIONS OF NEUROGENIC BOWEL DYSFUNCTION
10.1 Providers must understand the unique clinical presentation of complications related to neurogenic bowel dysfunction in individuals with SCI.

- Level of Evidence
  - IV
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
10.1 - Clinical Presentation of Complications

- Altered visceral sensation – level dependent
- Pain may be absent or dull and poorly localized
- Anorexia is a common with abdominal pathology
10.1 - Clinical Presentation of Complications

- **SCI above T5**
  - Abdominal tenderness is not common

- **SCI at or above T6**
  - AD
  - Nonlocalized discomfort
  - Increased spasticity
  - Rigid abdomen

- **SCI T6-T10**
  - Some localization of pain
    - sympathetic visceral afferent innervation
    - somatic afferent innervation from the abdominal wall

- **SCI below T12**
  - Presentation similar to neurologically intact individuals
10.2 Providers must be aware of the presentation and management of complete bowel obstructions, autonomic dysreflexia (AD), and skin breakdown.

- Level of Evidence
  - IV
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
10.2 - Bowel Obstruction

• Delineated with CT scan or possibly barium contrast enema
• If proximal bowel impaction, oral stimulants may be required.
  – Use of such stimulants in setting of obstruction could result in intestinal perforation.
• Individuals with SCI are also at significantly higher risk for ischemic bowel syndrome than were matched controls without SCI
10.2 - Skin Breakdown and Pressure Injury

- Fecal incontinence can lead to overgrowth of perianal microorganisms
  - Weakens skin
  - Increases risk of skin breakdown

- Prolonged sitting on inadequately padded bowel care seat without frequent pressure relief can result in pressure injury
10.2 - Autonomic Dysreflexia

- Individuals with SCI at or above T6 are at risk
- Common symptoms include
  - Bradycardia
  - Cardiac arrhythmia
  - Pounding headache
  - Anxiety
  - Sweating above the level of the SCI
  - Flushing
  - Blurred vision
  - Nasal congestion
  - Piloerection
10.2 - Autonomic Dysreflexia

• Possible NBD-related triggers include
  – Intraabdominal pathology
  – Bowel care positioning
  – Emptying techniques
    • Manual evacuation
    • Digital rectal stimulation
    • Suppository/Enema insertion
    • Irrigation
10.3 Treatment for hemorrhoids is conservative; if bleeding is refractory, non-excisional techniques are warranted. Excisional hemorrhoidectomy should be avoided.

- Level of Evidence
  - III
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
10.3 - Hemorrhoids

• Common benign anorectal conditions occur after SCI
  – Hemorrhoids
  – Anorectal abscess/fistula
  – Rectal prolapse
  – Pilonidal disease

• Flexible sigmoidoscopy or Pelvic MRI may be needed for diagnosis

• Contributing factors
  – Chronic constipation
  – Straining
  – Pelvic/Perineal pressure
  – Stasis
  – Hygiene
  – Impaired blood flow
10.3 - Hemorrhoids

- Best management is conservative
- In cases of chronic blood loss
  - Rubber band ligation
  - Infrared coagulation
  - Sclerotherapy
- Avoid excisional hemorrhoidectomy unless pedicle has evidence of necrotizing infection
12. ADAPTIVE EQUIPMENT
12.1 Use of adaptive equipment, including a suppository inserter and digital stimulation stick, should be considered for individuals with limited hand function or difficulty with reach.

- Level of Evidence
  - IV
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
12.1 – Suppository Inserter and Digital Stimulation Stick

• Adjustable, extended handle on these devices may be suitable for individuals with C6-C8 SCI and grip and dexterity limitations.

• May also be helpful in lower injuries for individuals with impaired reach or balance

• Should be considered as part of a comprehensive evaluation of the potential for an individual to become independent with bowel care
12.2 A clinical evaluation of a commode/shower chair should be performed with a focus on the individual’s current bowel care routine and transfer ability, goals of the individual and caregiver, and individual functionality, including postural stability, reach, and skin integrity.

• Level of Evidence
  – IV
• Strength of Evidence
  – C
• Level of Panel Agreement with the Recommendation
  – Strong
12.2 - Bathroom Equipment

- CPG contains table
  - Level of Injury
  - Potential functional performance outcome for bowel care
  - Bathroom equipment options
  - Assistive device options
13. IMPACT OF POSTURE AND MOVEMENT ON NEUROGENIC BOWEL DYSFUNCTION
13.1 Regular physical activity should be encouraged as part of a healthy lifestyle.

- Level of Evidence
  - III
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
13.1 - Regular Physical Activity

• Sparse literature about relationship between physical activity and bowel outcomes
• Cross-sectional study showed sports participation is associated with better bowel continence after SCI.
• General population, sedentary lifestyle has role in constipation
13.1 - Regular Physical Activity

• Although therapeutic devices such as FES leg cycle, body weight-supported walking systems or robotic walking exoskeletons can facilitate physical activity, relative affect on bowel function versus standing, standard physical activities, aerobic arm ergometer, or wheeling activities is unknown.
13.2 For some individuals, a standing program may be beneficial for bowel function but should be weighed against other means of physical activity, as well as precautions to undertake the activity safely.

• Level of Evidence
  – III
• Strength of Evidence
  – C
• Level of Panel Agreement with the Recommendation
  – Strong
13.2 - Standing Program

• May facilitate bowel management in some individuals who do not stand or walk regularly
  – Supported by cross-sectional surveys
  – Cross-over study (n=17) of tilt-table standing program did not show an effect on bowel outcomes

• Positive reports of improvement with bowel evacuation in upright position may be confounded by those with less impairment being able to achieve upright posture during bowel care
11. EDUCATION FOR INDIVIDUALS WITH SCI/CAREGIVERS
11.1 Education for individuals with SCI, caregivers, and health care providers should be available and comprehensive to all levels of learners.

- Level of Evidence
  - IV
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
11.1 Education for individuals with SCI, caregivers, and health care providers should be available and comprehensive to all levels of learners.

- Educational needs, as well as learners, should be identified.
- Learners can be considered individuals with SCI, caregivers, family members, or anyone else involved in their care.
- Addressing the level of education of the affected individual or caregiver is important in discerning the type of educational resources that will be needed.
- Readiness to learn and/or learning barriers should be assessed.
- Information should be available in the hospital setting as well as the community after he or she is discharged.
11.1 Education for individuals with SCI, caregivers, and health care providers should be available and comprehensive to all levels of learners.

- **Education Topics:**
  - Anatomy/Physiology
  - Process of defecation
  - Bowel Program
    - Dig stim/manual evacuation
    - Positioning
    - Equipment
  - Skin care considerations
  - Medication management
  - Nutrition and Fluids
  - Complications
  - Ostomy Care
  - Sexuality/Intimacy
14. PSYCHOSOCIAL ASPECTS OF NEUROGENIC BOWEL DYSFUNCTION
14.1 Assessments of NBD should include psychosocial aspects.

- Level of Evidence
  - III
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
14.1 Assessments of NBD should include psychosocial aspects.

- To minimize negative outcomes, bowel programs should be designed and revised with the participation of the individual with SCI and his or her caregiver.
- Assessments should include:
  - QOL
  - Depression
  - Anxiety
  - Pain
  - Cognition/Mental Status
  - Preparedness/Willingness
  - Diversity/Cultural
14.2 If an individual with SCI is having multiple problems with NBD or is noncompliant with the bowel program, a formal screening tool should be used to assess depression, anxiety, and QOL.

- Level of Evidence
  - I
- Strength of Evidence
  - C
- Level of Panel Agreement with the Recommendation
  - Strong
14.2 If an individual with SCI is having multiple problems with NBD or is noncompliant with the bowel program, a formal screening tool should be used to assess depression, anxiety, and QOL.

- The impact of neurogenic bowel on physical, social, and psychological QOL over time can assist the health professional in providing guidance.
- QOL, depression, and anxiety questionnaires should be incorporated into the assessment of post injury individuals with SCI.
- QOL should be included in the development of interventions and as an outcome in program evaluation and research.
CE/CME Credit

If you would like to receive continuing education credit for this activity, please visit:

https://pva.cds.pesgce.com