

# Case-Based Learning Module: NEUROGENIC BOWEL

## INTRODUCTION

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The majority of patients with spinal cord injury (SCI) have some degree of impaired bowel function. Primary care providers often do not feel comfortable with the management of neurogenic bowel issues, however we have an important role in helping to prevent complications and improving quality of life.

This module will enable clinicians to:

- Have an understanding of types of neurogenic bowel in SCI and management
- Understand common issues associated with neurogenic bowel
- Apply basic troubleshooting for common problems
- Know when specialist referral is appropriate

<b>Fun Fact:</b> Bowel function is rated as extremely important for individuals with SCI as it can affect all aspects of life - social, emotional, sexual, and occupational, and can have greater impact on life than loss of ambulation! <sup>1</sup>
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## CASE

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### **Bill, age 54**

Bill is a 54-year-old male who has a complete SCI at T7. He was recently discharged from a rehabilitation unit and states his bowel movements were generally well controlled while in hospital, but he has recently noticed his bowel movements are becoming firmer and harder to pass. He worries he is becoming constipated.

### ***What further information would you like?***

- *Fibre and fluid intake, amount of physical activity, and current methods used to manage his bowels. Specifically ask about early satiety, bleeding, nausea, and incontinence.*
- *How often is he performing his bowel routine?*
- *How often did he have a bowel movement prior to his injury?*
- *What medications is he currently taking?*
- *Has he tried any management strategies?*

Bill is trying to perform his bowel routine every couple of days but is finding it difficult to have a bowel movement more frequently due to the length of time it takes for him to complete his routine. He estimates his routine takes approximately 1.5 hours. He has had some mild nausea, and noticed a small amount of bright red blood with bowel movements. He admits he is drinking less fluid because it helps decrease the number of times he has to self-catheterize. He eats a “fair bit” of fruits and vegetables but has not been trying to choose high fibre foods. He is

currently using a combination of a bisacodyl suppository and digital stimulation every couple of days.

***How would you counsel Bill?***

- *It is important to emphasize the goal of his bowel routine is to have a soft, formed bowel movement at least every second day. Any change in bowel management can take three to five stool cycles before a difference in stool consistency is seen.*
- *Change one element at a time. Because Bill is currently constipated, it would be reasonable to add in a laxative such as PEG 3350 .*
- *Discuss the benefits of establishing a regular diet that consists of good high fibre foods and increase fluid intake with the goal of producing two to three litres of fluid per day. Making lifestyle changes should be done either prior to, or following the use of a laxative to ensure that the patient does not experience diarrhea and/or fecal incontinence as a result of too many changes at once.*

## INFORMATION SECTION

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### Introduction:

The majority of individuals with spinal cord injury (SCI) have some degree of impairment in the ability to control bowel movements, referred to as neurogenic bowel. The degree of impairment varies considerably depending on the level and completeness of injury and can significantly impact quality of life, potentially leading to constipation, pain, incontinence, lengthy bowel routine, social embarrassment, isolation and autonomic dysreflexia.

**Clinical Pearl:** Many individuals with SCI are not obvious (e.g., some people may be ambulatory), however, they can still be significantly affected by secondary complications like neurogenic bowel - it is important to always ask!

**Fun Fact:** Autonomic dysreflexia is a medical emergency where individuals with SCI at level T6 or above are at risk for sudden increases in blood pressure and possible serious consequences (see Autonomic Dysreflexia CBLM).

Neurogenic bowel results in problems with the storage and release of bowel movements. There are two main types of neurogenic bowel: upper motor neuron/hyperreflexic bowel and lower motor neuron/areflexic bowel.<sup>8</sup> The differentiation between the two will generally have already been made by a specialist based on level of injury and resulting signs and symptoms.

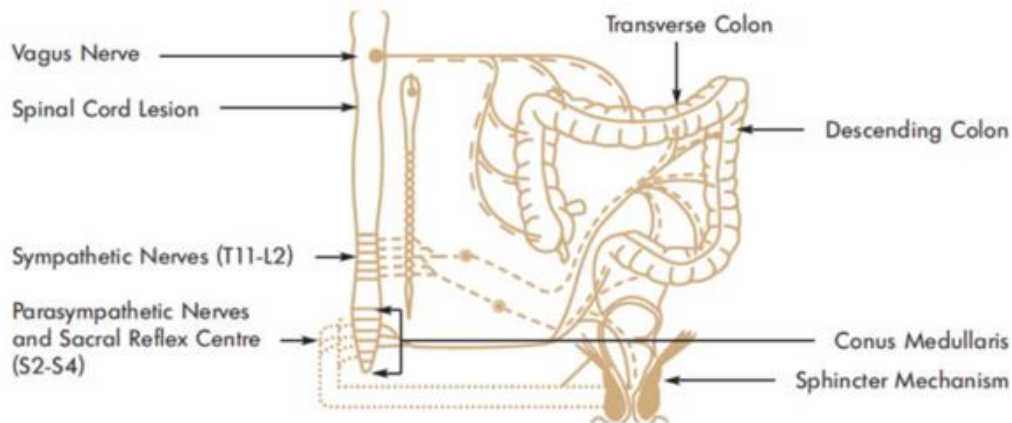
### Pathophysiology:

**Hyperreflexic bowel:** This type of bowel dysfunction occurs with spinal cord lesions at or above T12. With a hyperreflexic bowel, there is no longer cortical control over the external anal sphincter, leading to an inability to voluntarily relax the sphincter. However, there is preservation of the colonic spinal cord reflexes, resulting in reflexive stool propulsion when the rectum is full.<sup>1,3,4</sup> Clinically, this manifests as an inability to sense when the rectum is full, constipation and stool retention.<sup>1,8</sup>

- *Patient or caregiver uses rectal stimulant suppository and then performs digital stimulation of rectum using a finger to empty bowel every 1-2 days*
- *Aim for soft stool consistency*

**Areflexic bowel:** This type of bowel dysfunction occurs with spinal cord lesions at L1 and below. With areflexic bowel, there is a disruption in the spinal cord defecation reflex, slowed stool propulsion, and a flaccid or atonic external anal sphincter. Clinically, this manifests as constipation with drier and round stool, and an increased risk of fecal incontinence due to lack of external sphincter tone.<sup>1</sup>

- *Patient performs manual extraction of feces 1-2 times per day (**rectal stimulants often ineffective**)*
- *Aim for firm stool that can be manually evacuated but retained between sessions*



**Figure 1:** Innervation of the colon, anal sphincters and pelvic floor

### **Primary Care Assessment of the Patient with Neurogenic Bowel**

Primary care providers often have little training or knowledge regarding neurogenic bowel and are not expected to be experts. However, it is important for family physicians to inquire about a patient's bowels annually (or more frequently if there are concerns<sup>2,3</sup>), and have a basic understanding of common problems, solutions and when to refer.

### **History**

A thorough history is critical in the assessment of neurogenic bowel. It is important to ask patients about the following:

- Stool consistency (constipation, diarrhea)
- Bleeding (trauma from bowel routine, hemorrhoids)
- Fecal incontinence
- Post prandial abdominal distension or abdominal pain
- Early satiety
- Nausea
- Medications or changes in medications (many medications in SCI affect bowels, such as antispasmodics, narcotics, anticholinergics, antibiotics)
- Autonomic dysreflexia, if applicable
- Premorbid stooling history
- Comorbid conditions
- Lifestyle factors (fibre, fluid, and exercise)
- Effect on function
- What is their current bowel program?
  - Frequency
  - Length of time to complete (usually aim for < 1 hour)
  - Laxatives, suppositories
  - Satisfaction

### **Physical examination**

Many primary care practices are not conducive to examining an individual with SCI who is non-ambulatory. Transferring to an examination table can be difficult unless the clinic is equipped with a hi-lo table and/or a mechanical lift. If a physical exam is performed, some helpful tips are provided below:

### **Abdominal exam**

It can be helpful to place a pillow under the patient's legs to help promote relaxation of the abdominal muscles and decrease spasticity prior to superficial and deep palpation of the abdomen.<sup>3</sup>

### **Rectal exam**

Observe for any hemorrhoids, fissures or other rectal masses. If there is a history or risk of autonomic dysreflexia, it is recommended to use an anesthetic lubricant, such as lidocaine gel 2%. Prior to performing the digital rectal exam (DRE), hold the examination finger firmly against the anal verge; this should promote passive relaxation of the external anal sphincter (EAS). Once the EAS opens, perform the DRE.<sup>3</sup>

**Fast Fact:** Specialists will generally perform a more detailed neurological examination, and assess the **sacral reflexes**, notably the anocutaneous and bulbocavernosus reflexes<sup>3</sup> are used to differentiate hyperreflexic and areflexic bowel syndromes. These reflexes are both absent in a patient with areflexic bowel. The anocutaneous reflex, also known as anal wink sign, is elicited by lightly touching the perianal skin, which, if present, should cause the EAS to reflexively contract.<sup>3</sup> The bulbocavernosus reflex is performed by squeezing the glans penis or pressing the clitoris and palpating the contraction of the bulbocavernosus and EAS.

**Clinical Pearl:** It is also important to assess **perineal sensation**; if sensation is present, then anorectal sensation is usually present. This is a clinically useful distinction as it can help guide bowel management as mechanical interventions for bowel management may be uncomfortable. In this case, it may be preferable to use rectal stimulants (suppositories or enemas).<sup>4</sup>

### **Bowel Management Strategies**

Bowel management plans should be comprehensive and individualized, incorporating lifestyle changes, mechanical and chemical means of bowel stimulation, and medications. Bowel management routines aim to accomplish three main goals:

- Establish and maintain regular and reliable emptying in an acceptable timeframe
- Maintain fecal continence
- Prevent constipation and other complications (eg. AD)<sup>2</sup>

### **Lifestyle Factors**

It is important to focus on lifestyle issues such as diet, timing, and exercise when a routine is not working.

## Fibre

- Goal of 15-30 g/day
- Start with 15 g/day, increase gradually<sup>3</sup>
- Increasing fibre can help bulk up soft stool and soften hard stool:
  - Insoluble fibre: not digested and helps with evacuation if constipated
    - Wheat bran, flax seed, green leafy vegetables, fruits/vegetable with skin, whole grains
  - Soluble fibre: partially digested and helps with loose stool
    - Oatmeal, squash, white rice, crackers, bananas, applesauce, carrots, apples without skin
- Important to also have adequate fluid, and to increase fluid intake with an increase in fibre

## Fluids

- Goal of 1.5-2 L of fluid per day

## Timing of bowel routine

- Scheduling a bowel routine in the morning 20-30 minutes after eating/drinking is an effective strategy and takes advantage of the gastrocolic reflex
- Consistent and predictable routine is critical to prevent constipation and incontinence

## Exercise

- Increased physical activity can help soften stool
- Recommend 20 minutes of aerobic exercise at least two times per week and strength training at least two times per week<sup>5</sup>

## Bowel stimulation

Most patients will require mechanical and/or chemical stimulation to assist with bowel movements. A general guiding principle for the use of rectal stimulants is to choose the gentlest method that produces an effective response.<sup>4</sup> Chemical stimulants are listed below in the pharmacologic management chart, under suppositories and enemas.

### ***Mechanical stimulation***

Mechanical stimulation can be performed by either the patient or a care provider. **Extra caution should be used** when performing these procedures in patients with lesions at T6 or above due to an increased risk of autonomic dysreflexia. Use of an anesthetic lubricant should be considered, such as Lidocaine 2% gel.<sup>3,6</sup> There are two main methods used, digital stimulation and manual evacuation.

**Clinical Pearl:** To help prevent autonomic dysreflexia in susceptible patients during their bowel routine, prescribe Lidocaine or Xylocaine gel 2%. It can be inserted into the rectum 5 to 10 minutes prior to mechanical stimulation to help prevent associated problems.<sup>6</sup>

- **Digital stimulation** involves gently inserting a gloved lubricated finger into the rectum and performing a rotating movement with the finger until the internal sphincter contracts, the bowel wall relaxes, or the passage of flatus or stool occurs.<sup>3</sup> This normally takes approximately 15-20 seconds. It is repeated every 5 to 10 minutes until the rectum is empty. This technique is often used in patients with hyperreflexic bowel.
- **Manual evacuation** involves gently inserting one or two gloved lubricated fingers into the rectum and breaking up and removing stool. This is commonly the primary method used for patients with areflexic bowel, or can be used prior to insertion of a chemical stimulant for patients with hyperreflexic bowel.<sup>3</sup>

### Pharmacologic Management

<u>Type</u>	<u>Use</u>	<u>Comments and side effects (SE)</u>
<b>Stool Softener</b> - Docusate sodium	-1-2 tabs OD-BID	Not very effective
<b>Laxatives</b>  <b>Stimulant</b> - Bisacodyl - Senna  <b>Osmotic</b> - Milk of Magnesia - Polyethylene Glycol  <b>Hyperosmotic</b> - Lactulose	-1-4 tabs taken night before (at least 8 hours)  - 30-60 mL OD or divided doses - 17 g OD, taken night before (at least 8 hours)  - 15-30 mL od-bid	Metamucil can be dangerous in individuals with an reflexic/UMN bowel pattern – may increase effort required to defecate  SE: Can cause cramping/abdominal pain/gas Some suggest long-term use of Senekot due to side effects  SE: Loose stool, risk, hypermagnesemia  SE: Nausea, cramping, diarrhea  SE: abdominal cramping/bloating/diarrhea
<b>Suppositories</b> - bisacodyl, mineral oil - bisacodyl, PEG based - Glycerine	Rectal stimulants, insert prior to bowel program 30 minutes (ensure not in stool but make contact with bowel wall)	SE: rectal discomfort, can cause liquid discharge due to chemical irritation  *Studies have shown decrease in bowel care time with PEG based regiment *glycerine suppositories might be more gentle
<b>Enemas</b> - eg. Sodium citrate/sodium lauryl sulfoacetate/glycerol, fleet	- small volume enemas best, insert one tube pr 5-20 minutes prior to bowel routine	-SE: <b>could trigger AD in susceptible patients</b>

**Table 1:** Pharmacologic Management

### Surgical management

The creation of a stoma through a colostomy or an ileostomy is generally reserved for patients who have been unsuccessful with, or who have experienced complications from, other management strategies.<sup>1</sup>

### Management of Neurogenic Bowel at a Glance

<u>Type of Neurogenic Bowel</u>	<u>Hyperreflexic Bowel (Above L1-L2)</u>	<u>Areflexic Bowel (Below L1-L2)</u>
<b>Dietary Considerations</b>	Avoid highly processed and spicy foods. Fibre intake of at least 15-30 g/day. Recommended to start at 15 g/day and increase slowly monitoring for side effects and impact on stool consistency.	
<b>Fluid Intake</b>	Ensure adequate fluid intake of 1.5 – 2.0 L/day	
<b>Target Stool Consistency</b>	Soft formed stool (Bristol Scale 4)	Firm consistency (Bristol Scale 3; key to helping maintain continence)
<b>Frequency of BM</b>	At least every second day	Daily or twice daily <sup>3</sup>
<b>Timing of Bowel Movements</b>	Schedule enema or suppository 30 minutes postprandial	Schedule bowel routine 30 minutes postprandial (Note: Suppositories are frequently omitted)
<b>Management</b>	<ol style="list-style-type: none"> <li>1. Manually remove any waste material in rectal vault prior to inserting rectal stimulant to ensure good contact with mucosa</li> <li>2. Insert enema or suppository (Bisacodyl suppository)</li> <li>3. Perform anal stimulation for 15-20 seconds every 5- 10 minutes until rectum is empty</li> </ol>	<ol style="list-style-type: none"> <li>1. Manual evacuation and/or Valsalva maneuvers should be completed in an upright or side-lying position until the rectum is empty</li> </ol> Note: the bladder should be emptied prior to bowel routine if Valsalva maneuvers are used to avoid bladder reflux <sup>3</sup>
<b>Monitor</b>	Risk of Autonomic Dysreflexia (e.g., headache, sweating, blotchy rash) with lesions above T6 and abdominal spasm	

**Table 2:** Hyperreflexic and Areflexic Bowel Management

- Note: if patient has a history of AD, or is at risk of AD, it is advisable to consider using an anesthetic lubricant, such as lidocaine gel 2% when performing bowel routine

### Complications

Approximately 25% of patients with SCI have been hospitalized secondary to issues relating to their bowels.<sup>3,9</sup> There is some evidence to suggest that there is an increased prevalence of gastrointestinal complications with increased time since injury, suggesting that there may be a preventative role.<sup>3,7</sup> It is therefore critical to establish an effective bowel management routine to help avoid the potential complications of neurogenic bowel. Some of the common complications and associated management strategies of neurogenic bowel include:

- Hemorrhoids/rectal prolapse
  - Try to modify bowel management strategy to decrease straining and digital stimulation
  - Try gentler stimulant suppository (ie. Glycerine)
  - Aim for softer stool
  - Topical anti-inflammatories or anti-inflammatory suppositories
  - Consider seating assessment



- Possible hemorrhoidectomy (more difficult in SCI)
- Fecal impaction
  - May require abdominal x-ray to help rule out obstruction
  - Prompt manual evacuation if stool palpated, otherwise trial of oral agents (particularly oral stimulants e.g., bisacodyl or magnesium citrate)
  - Note: If bowel obstruction cannot be ruled out, exercise caution with the use of oral medications<sup>3</sup>
- Autonomic dysreflexia
  - Patient should be aware and inform healthcare provider

### **Indications for Referral:**

1. Bowel program ineffective despite attempts to change (consider referral to: SCI rehabilitation specialist)
2. Fecal impaction (consider referral to: SCI rehabilitation specialist; homecare nursing; emergency department for acute management)
3. Frequent and/or significant autonomic dysreflexia with bowel program (consider referral to: SCI rehabilitation specialist; emergency department for acute management)

### **Preventative Screening**

It is important for primary care providers to review bowel management with patients with SCI at least annually.

#### *Colorectal cancer screening:*

- Follow same recommendations as general population.
- FOBT can be used but false positives may occur if complications such as hemorrhoids are present. A high rectal specimen may prevent false positives.<sup>2</sup>
- Colonoscopy may be considered, however, planning is necessary to ensure the facility is accessible and that appropriate preparation can be done. This can be facilitated by a detailed referral to the specialist performing the colonoscopy.
- See Preventative Health CBLM

### SUMMARY

- The majority of individuals with spinal cord injury (SCI) have some degree of impairment in the ability to control bowel movements
- Neurogenic bowel results in problems with the storage and release of bowel movements. There are two main types of neurogenic bowel: upper motor neuron/hyperreflexic bowel and lower motor neuron/areflexic bowel
- Bowel management plans should be comprehensive and individualized, incorporating lifestyle changes, mechanical and chemical means of bowel stimulation, and medications
- Bowel management routines aim to accomplish three main goals:
  - Establish and maintain regular and reliable emptying in an acceptable timeframe
  - Maintain fecal continence
  - Prevent constipation and other complications
- See Pharmacologic and Surgical Management options
- See Indications for Referral

## REFERENCES

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