Neurogenic Bowel Management: Secondary Complications and Quality of Life

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Learning Objectives

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

1. Describe methods and categories of neurogenic bowel management;
2. Describe complications associated with neurogenic bowel management;
3. Identify aspects of neurogenic bowel management that impact on quality of life.
Neurogenic Bowel

*Neurogenic bowel* is the loss or absence of normal intestinal function due to nerve damage or birth defects. It is characterized by the inability to control the elimination of stool from the body.

**Populations/Diagnostic Groups at Risk**

- Spinal Cord Injury
- Multiple Sclerosis
- Spina Bifida
- Long Term Care Patients
- TBI
Complications of Neurogenic Bowel

- Incontinence
- Constipation
- Dermatitis
- Mucosal Damage
- Pressure Ulcers
Bowel Management Challenges in Persons with Spinal Cord Injury
Gastrointestinal Complications in Persons with Spinal Cord Injury*

• All persons with complete SCI have neurogenic bowel; most persons with incomplete SCI have some degree of bowel dysfunction.

• Excluding bladder dysfunction, gastrointestinal disorders are the most common complication of patients with spinal cord injuries.

• 95% of SCI patients require at least one therapeutic intervention to initiate defecation.

*Stiens, et al., 1997; Cosman, et al., in Whiteneck et al., 1993; Consortium for Spinal Cord medicine Clinical Practice Guideline on Neurogenic Bowel, 2002
54% of SCI patients report bowel and bladder dysfunction as a major life-limiting problem.
Bowel Management Challenges in Persons with Multiple Sclerosis
Multiple sclerosis (MS) is a chronic autoimmune disorder affecting movement, sensation, and bodily functions, caused by destruction of the myelin insulation covering nerve fibers (neurons) in the central nervous system (brain and spinal cord).

- Approximately 400,000 people have MS in the United States; 2.1 million worldwide.
Multiple Sclerosis

- 68% of persons with MS experience bowel dysfunction:
  - Most common problems: constipation, diarrhea, and incontinence.
  - Weakened abdominal muscles can make the actual process of having a bowel movement more difficult.
  - Constipation puts extra pressure on the urinary system and can cause bladder problems such as incontinence.
  - MS can decrease sensation in the rectal area and may result in the loss of the urge to eliminate.
Neurogenic Bowel Complications:
Fecal Incontinence Affects Skin Integrity

- Exposure to stool changes the pH of the skin and impairs the integrity of the barrier formed by the skin cells, exposing the skin to harmful digestive enzymes.

- Overgrowth of microorganisms leads to skin irritation or infection, further weakening the skin’s defense. Coupled with friction and pressure, incontinence can lead to tissue erosion and pressure ulcers, particularly in skin that is already compromised by prolonged exposure to stool and urine.
Fecal incontinence in hospitalized patients increases the risk of nosocomial infections, and development of pressure ulcers which, in turn, increases mortality and morbidity\(^1\)

\(^1\)Driver, 2007
Patients with fecal incontinence were 22 times more likely to have pressure ulcers than patients without fecal incontinence.”¹

“The odds of having a pressure ulcer were 37.5 times greater in patients who had both impaired mobility and fecal incontinence than in patients who had neither.”¹

¹.Maklebust and Magnan, 1994
Incontinence Associated Dermatitis

- Incontinence-associated dermatitis (IAD) is an inflammation of the skin that may occur when urine or stool comes into contact with perineal or perigenital skin.
- Fecal and urinary incontinence can damage the skin and render its barrier function ineffective.¹

1. American Medical Technologies, Adapted from the work of Joan Junkin MSN, APRN-CNS, CWOCN; Monthly Clinical Updates & Educational FAQs.
Incontinence Associated Dermatitis

Prevalence

- Studies at long-term care facilities show IAD prevalence can range from 5.6% to 50%, while incidence rates range from 3.4% to 25%. \(^2,^3\)
- In acute care, one 976-patient study found 20.3% of patients were incontinent. \(^2,^3\)
- IAD affects 11% of the general patient population.
Secondary Complications: Mucosal Discharge and Damage to the Rectal Mucosa

Some products used to manage neurogenic bowel may result in acute injury to the rectal mucosa.¹

- persistent inflammation as evidenced by neutrophils present in the superficial epithelium and lamina propria;

- changes that may mimic a mild, acute colitis;

- mucosal discharge may last up to 3 days;

- damage to the myenteric plexus colonic dysmotility may occur from chronic use of stimulant laxatives.

¹Saunders, et al., 1990.
Sitting Acquired Pressure Ulcers in Persons with Spinal Cord Injury

Etiology

- Biomechanical aspects of pressure ulcer formation;
- Skin blood flow and skin temperature;
- Immobility-inability to shift weight/redistribute weight;
- Lack of sensation;
- Activity-induced long periods of sitting (bowel management).
Sitting Acquired Pressure Ulcers

• Bowel care time has been studied and results indicate that some methods are more effective in less time than other approaches.
  ➢ Bowel programs may take between 30 and 180 minutes of sitting on a commode to complete.¹

• Equipment essential during bowel care also has been studied, although new technology in bowel chair design and manufacture has been slow to evolve.²

Sitting Acquired Pressure Ulcers

- The two most significant “fatal” flaws in commode-shower chair design as reported by consumers:
  - Risk of falls during transfers
  - Risk of pressure ulcers due to inadequate padding and long duration of the bowel care process.\(^3\)

\(^3\)Malassigne, et al., 2000.
Sitting Acquired Pressure Ulcers

Research:

- According to a self-report survey completed by 1238 veterans with SCI, 6% reported that their pressure ulcers were directly related to the use of neurogenic bowel management equipment.¹

- In another study of 147 persons with SCI, who regularly use bowel care/shower chairs at home, more than 66% were dissatisfied with their chairs. Safety, keeping chair clean, lack of durability, and risk of pressure ulcers were reported satisfaction issues.²

¹Luther et al., 2002  
Sitting Acquired Pressure Ulcers: Their relation to Neurogenic Bowel Management

The adverse effects of pressure exerted during sitting on a commode chair during bowel care procedures remain under-investigated.

• Routine weight shifts are not sufficient to recover tissue perfusion. The 15-30 seconds of weight shifts are ineffective in returning oxygen to the unloaded level necessary to maintain tissue viability (Coggrave & Rose, 2003). It is not practical to perform an almost 3 minute weight during bowel care.

• In a study of 277 veterans with SCI, commode chair-related pressure ulcers occurred in 24% of the research population.
• There continues to be little in the scientific literature *directly* linking time-to-evacuation during bowel care to the development of pressure ulcers. However, it is reasonable to believe that sitting for long periods of time on a commode chair, without the benefit of weight shifts, can result in serious tissue damage.
Equipment Associated with Neurogenic Bowel Management and Sitting Acquired Pressure Ulcers

• Wheelchairs, cushions and seating systems
• Beds and mattresses
• Commode/shower chairs
• Car seats
• Miscellaneous seating surfaces (sofas, lounge chairs, benches)
Pressure Ulcers Are Costly to Institutions

- As of 2008, CMS will not reimburse hospitals for pressure ulcers that are not present on admission.
- Proposed 2012 rule for Inpatient Rehabilitation Facilities, CMS will not reimburse for pressure ulcers.
- Skin conditions were the second most frequent cause of hospitalization;
- Mean hospitalization charges in 2009 dollars were highest for skin conditions ($75,872). ¹

¹DeVivo & Farris, TSCIR 2011, Vol 16:53-61
Pressure Ulcers Are Costly to Institutions

- VA Study: 11% (n=1208) of total study population (n=10,077) had pressure ulcers in 2007.\(^1\)
- Total inpatient days: 61 with pressure ulcers vs. 9.19 without pressure ulcers;
- Total health care costs: $100,935 vs. $27,914, \(p<.001\);
- Inpatient costs: $91,341 vs. $13,754, \(p<.05\).

\(^1\)Stroupe et al. TSCIR 2011, 16:62-73
Pressure Ulcer Costs

Overall, the cost of treating pressure ulcers in the United States is $1.2 to $1.3 billion annually. *

*Regan et al., Arch Phys Med Rehabil 2009;90:213-231
Review of Management Strategies for a Neurogenic Bowel

- **Stimulants** - induce peristalsis in the colon
- **Osmotics** - work by preventing the re-absorption of water, creating bulk and stimulating peristalsis
- **Bulk Formers** - act by preventing the re-absorption of water by the bowel, and increase the bulk of the stool stimulating peristalsis
- **Softeners** - work by adding gas to the feces rather than water creating softening and lubrication.
- **Contact irritants** – cause a direct irritation to the rectal wall, causing a sense of fullness and innervating the defecation reflex
Review of Neurogenic Bowel Management Strategies

• **Lubricants** - assist to lubricate the stool

• **Digital check** – used to check if there is feces in the rectum either before or after evacuation.

• **Digital stimulation and anal stretch** – triggers the defecation reflex to assist with evacuation in UMN

• **Manual removal** – used to evacuate in LMN

• **Diet** – a well balanced regular diet with a high fluid intake is recommended
# Comparison of Products Used for Neurogenic Bowel (Rectal)

<table>
<thead>
<tr>
<th>Active Ingredient</th>
<th>Rectal Devices</th>
<th>Pulsed Irrigation System</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RECTAL</strong></td>
<td><strong>DOCUSATE SODIUM MINI-ENEMA</strong></td>
<td><strong>VEGETABLE OIL BASED BISACODYL</strong></td>
</tr>
<tr>
<td>ACTIVE INGREDIENT</td>
<td>283 mg of Docusate Sodium</td>
<td>10 mg Bisacodyl</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>Proprietary blend of Polyethylene glycol and Glycerine base Docusate Sodium mini enema.</td>
<td>Bisacodyl suppository in a vegetable oil base.</td>
</tr>
<tr>
<td>TIME TO EFFECT</td>
<td>15-20 minutes Safe for daily and long term use, non-habit forming, no mucosal discharge or afterburn.</td>
<td>74.5 Minutes</td>
</tr>
</tbody>
</table>
# Comparison of Products Used for Neurogenic Bowel (Oral)

<table>
<thead>
<tr>
<th>ORAL</th>
<th>PEG 3350</th>
<th>BISACODYL TABLET</th>
<th>LACTULOSE</th>
<th>MAGNESIUM HYDROXIDE</th>
<th>DOCUSATE SODIUM</th>
<th>SENNA</th>
<th>PSYLLIUM MUCILLOID</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTIVE INGREDIENT</td>
<td>Polyethylene Glycol 3350</td>
<td>5-10 mg Bisacodyl. Adults by mouth 10mg-15mg</td>
<td>Each 15 ml contains: 10g Lactulose (and not more than 1.6 g galactose, not more than 1.2 g lactose, not more than 0.8 g epilactose, and not more than 0.1g fructose.</td>
<td>Various: Saline, Bisacodyl, or mineral oil in 15 ml or larger solution.</td>
<td>Capsule or Liquid. 50 to 500 mg by mouth</td>
<td>Senna leaves or pods have been used as a laxative at doses of 0.6 to 2 g/day, with a daily dose of sennoside B from 20 to 30 mg</td>
<td>Mix Psyllium Powder with a full glass (at least 8 oz or 240 ml) of water or other liquid.</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>Osmotic liquid-Polyethylene glycol 3350 is a laxative solution that increases the amount of water in the intestinal tract to stimulate bowel movements.</td>
<td>Stimulant tablet-Acts as cathartic stimulant.</td>
<td>Produces increased osmotic pressure within colon and acidifies its contents, resulting in increased stool water content and stool softening. Causes migration of ammonia from blood into colon, where it is converted to ammonium ion and expelled through laxative action.</td>
<td>Osmotic liquid-Magnesium hydroxide is used as a laxative to relieve occasional constipation (irregularity) and as an antacid to relieve indigestion, sour stomach, and heartburn.</td>
<td>Facilitates stool softening by detergent activity, prevention of dry, hard stools.</td>
<td>A bitter tea can be made containing senna 0.5 to 2 g (i.e., ½ to 1 teaspoon). Senna should not be used at higher doses or for extended periods of time.</td>
<td>Psyllium Powder is a fiber laxative. It works by absorbing water and swelling in the intestines. This helps the stool form the bulk necessary to be easily passed.</td>
</tr>
<tr>
<td>TIME TO EFFECT</td>
<td>Generally produces a bowel movement in 1 to 3 days.</td>
<td>6 to 10 hours.</td>
<td>May take up to 48 hours before a bowel movement may occur</td>
<td>3 to 6 hours.</td>
<td>12 to 72 hours.</td>
<td>6 to 12 hours.</td>
<td>12 to 24 hours.</td>
</tr>
</tbody>
</table>
Neurogenic Bowel and Quality of Life

- Quality of Life and incontinence
- Quality of Life and pressure ulcers
Bowel programs that are consistent and effective promote enhanced quality of life.
Quality of Life and Incontinence

Bowel dysfunction and incontinence interfere with\(^1\):

- Personal relationships
- Feelings of self-worth
- Degree of life satisfaction with leisure time, family life and life in general
- Community integration

\(^1\)Roach, et al., 2000; Lynch et al., 2000
Quality of Life and Pressure Ulcers

• Social isolation
• Decreased mobility
• Self image
• Lifestyle
• Negative effect on relationships
• Lost time from work; lost wages
• Loss of self-esteem and self worth

Langemo et al., 2000; O’Connor & Salcido, 2002
Conclusion/Summary

• The most frequently used neurogenic bowel management products may be associated with:
  ❖ More incontinence;
  ❖ Increased risk of pressure-induced tissue damage resulting from longer duration of commode sitting;
  ❖ More damage to the mucosal tissue than other methods available to persons with spinal cord injury.
• Other products may improve neurogenic bowel function as they have been shown to:

  ❖ Reduce the occurrence of bowel incontinence;
  ❖ Reduce the duration of commode sitting and the risk of pressure ulcers;
  ❖ Not cause inflammation or seepage of the mucosal lining of the lower bowel (Amir et al., 1998; House & Stiens, 1997; Dunn & Galka, 1994),
  ❖ Improve quality of life and social/community integration of persons with spinal cord injury.
Conclusion/Summary

• In the absence of science directly linking bowel management protocols to the development of pressure ulcers, one can extrapolate from the vast body of literature on pressure ulcer etiology, prevention, and treatment that uninterrupted sitting on any surface by persons with spinal cord injury as well as moisture and incontinence, increase the risk of tissue pressure damage.
Conclusion/Summary

• Products and strategies for managing neurogenic bowel must be evaluated for their effectiveness as well as for their ability to reduce the risk of complications such as incontinence, mucosal damage and pressure ulcers.
Summary

• The complications that occur from neurogenic bowel in persons with spinal cord injury-constipation, mucosal damage and seepage, incontinence and risk of pressure ulcers-impact on quality of life and community integration.

• These complications may be significantly reduced or even eliminated with more careful examination of these strategies and products used to manage neurogenic bowel in persons with spinal cord injury.
Neurogenic bowel management and its association with pressure ulcers has had limited attention in the spinal cord injury research arena.

Clinical researchers are strongly encouraged to develop clinical studies on neurogenic bowel management products and strategies in order to identify the most effective approaches to this complication of spinal cord injury.
References


References


References


