Management of the Neurogenic Bowel for Adults with Spinal Cord Injuries
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Reviewed and updated in 2013 by the authors.
ACKNOWLEDGEMENTS

First (2002) and Second (2005) Editions:
This document was originally published as a fact sheet for the Rural Spinal Cord Injury Project (RSCIP), a pilot healthcare program for people with a spinal cord injury (SCI) conducted within New South Wales involving the collaboration of Prince Henry & Prince of Wales Hospitals, Royal North Shore Hospital, Royal Rehabilitation Centre Sydney, Spinal Cord Injuries Australia and the Paraplegic & Quadriplegic Association of NSW. It was first published in June 2002 as part of a series of fact sheets for the RSCIP, and revised in 2005. We wish to acknowledge Glen Stolzenhein, Debbie Hagen, Jane Temblett and Dr Susan Rutkowski for their contribution to the original factsheet. The project was funded by the Motor Accident Authority of NSW.

Third edition, 2014:
Acknowledgment of contributions to the current edition: Simone Wright and Susan Nelan for content on optimising dietary and fluid intake; Kylie Wicks, Wendy Jannings, Kylie Jones, Sue Pinkerton, Karla Cooper and Rita Cusmiani for providing feedback on previous drafts.

The work by Selina Rowe, Manager, NSW Spinal Outreach Service, Royal Rehab, Ryde, and Frances Monypenny, ACI Network Manager, State Spinal Cord Injury Service, Chatswood, NSW, Australia, is coordinating and managing the project to review and update this fact sheet, on of 10 fact sheets, is acknowledged.

The 2014 revision was funded by the NSW Agency for Clinical Innovation.

All recommendations are for patients with SCI as a group. Individual therapeutic decisions must be based on clinical judgment with a detailed knowledge of the individual patient’s unique risks and medical history, in conjunction with this resource.
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BOWEL MANAGEMENT FOLLOWING SCI AT A GLANCE

Stool softener and/or bulking agents
(8-12 hours prior to bowel management or as recommended by manufacturer)

Plan bowel emptying 20-30 minutes after food or drink (use of gastrocolic reflex)

Abdominal massage

Lower motor neuron (flaccid) bowel
- Manual removal of faeces
- PR assessment 5-10 minutes after stool has passed to ensure rectum is empty
  - Rectum full
  - Rectum empty
  - Repeat cycles of manual removal and PR assessment until rectum is empty

Upper motor neuron (reflex) bowel
- PR assessment and rectal stimulant (suppository or enema)
- Digital stimulation 15-20 seconds
- PR assessment 5 minutes after last stool
  - Rectum full
  - Rectum empty
  - Repeat digital stimulation every 5 minutes or until rectum is empty
  - PR assessment: Manual removal of faeces if reflex evacuation is incomplete

LOWER MOTOR NEURON BOWEL
Aim
Bristol stool type 3, once or twice daily

UPPER MOTOR NEURON BOWEL
Aim
Bristol stool type 4, daily or second daily
1. INTRODUCTION

Neurogenic bowel is a general term for a malfunctioning bowel due to neurological dysfunction or insult resulting from internal or external trauma, disease or injury. The majority of persons with spinal cord injury (SCI), even those who can walk or who have very incomplete injuries, experience problems with faecal defaecation, such as constipation, difficulty with evacuation and faecal incontinence. Following SCI a systematic approach to bowel management is recommended to prevent these problems, minimise complications and maximise quality of life.

While the term neurogenic bowel emphasises the neurological origins of bowel dysfunction following SCI, bowel management following SCI requires consideration of more than just the level and completeness of the SCI. As with all people, fluid intake, diet, activity/exercise, medications, along with the availability of a private and accessible toilet, can influence bowel emptying in people with SCI. The person’s pre-SCI bowel pattern is another crucial factor to consider.
2. FUNCTIONAL ANATOMY & PHYSIOLOGY OF DEFAECATION

Defaecation is the final function of the gastrointestinal tract. It involves elimination of waste and undigested food in the form of faeces from the colon via the anus. Movement of ingested food and fluids from the stomach through the gut is facilitated by the enteric nervous system in interaction with the central nervous system via the sympathetic and parasympathetic system and neuropeptides. See Figure 1 for details of innervations of the colon, anal sphincters and pelvic floor.

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

*Sourced from the Rural Spinal Cord Injury Project Management of the Neuropathic Bowel for Adults with Spinal Cord Injuries 2005 guidelines fact sheet

In individuals who are neurologically intact, the bowel is typically emptied daily, usually in the morning and in response to a gastrocolic reflex (where ingestion of food stimulates defaecation 20-30 minutes later). Normally, when a person senses that the rectum is full they are able to suppress the urge to defecate by contracting the external anal sphincter until it is convenient to access a toilet. Ideally, at that time, an optimal position with knees flexed and the upper body bending forward supported by elbows or hands on knees is assumed for defaecation. The person can easily increase intra-abdominal pressure to push faeces in the rectum towards the anorectal verge. With stretching of this area, the anorectal reflex is stimulated relaxing the proximal anal region to facilitate expulsion of faeces. Voluntary contraction of the external anal sphincter completes evacuation.

Faeces can take a variety of forms, which are best described using the Bristol Stool Form Chart (Figure 2).

Figure 2 – Bristol Stool Chart

Reproduced by kind permission of Dr KW Heaton, Reader in Medicine at the University of Bristol.
3. DEFAECATION FOLLOWING SPINAL CORD INJURY

After SCI, a person can be disadvantaged in all aspects of the defaecation process. The level and completeness of SCI can impact on gastric emptying time, colonic transit time and whole gut transit time, anal sphincter tone, pelvic floor functioning, sitting balance, upper limb function, walking and transfers.

The gastrocolic reflex may be slowed or absent. For some, mouth to caecum times can be delayed, but delays beyond the ileocaecal valve are experienced by most. Obtaining an appropriate flexed position for defaecation and the optimal anorectal angle can also be a challenge due to poor trunk control and balance. Commode chairs often do not allow forward flexion to help address this limitation. An inability to increase intra-abdominal pressure during defecation is a problem for some. Sensation of a full rectum may be altered or absent, and for some anorectal dyssynergy is a problem. The availability of competent assistants along with accessible bathroom facilities are also crucial factors.

Constipation, difficulty with evacuation and faecal incontinence are common manifestations of the loss of control over defaecation associated with SCI. While all are experienced across the SCI population, the level of SCI suggests two particular patterns (see Table 1).

A bulbocavernosus (bulbo-anal) reflex is present if, after applying pressure to the glans penis or clitoris, a palpable and visible contraction of the anal sphincter occurs. Applying a gentle tug to the urethral catheter can also elicit a palpable anal response. This test determines whether the sacral reflexes have been spared.

The anal reflex, if positive, will also indicate sparing of the sacral reflexes, when a visible contraction of the anal sphincter is initiated in response to a pinprick applied to the buttock just lateral to the anus.

While incomplete SCI and time since SCI can result in variations on these patterns of clinical presentation, common manifestations of the loss of control over defaecation associated with SCI, namely constipation, difficulty with evacuation and faecal incontinence, continue to threaten quality of life for the person with SCI. This makes the active management of defaecation following SCI a vitally important undertaking.

### TABLE 1 – Patterns of clinical presentation of bowel dysfunction following SCI

<table>
<thead>
<tr>
<th>Supraconal (upper motor neuron [UMN]/reflex) lesion</th>
<th>Conal/cauda equine (lower motor neuron [LMN]/flaccid) lesion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury or damage usually at or above T12(3)</td>
<td>Injury or damage usually L1 and below(4)</td>
</tr>
<tr>
<td>• Positive anal and bulbospongiosus reflex(3)</td>
<td>• Absent anal and bulbocavernosus reflex(3)</td>
</tr>
<tr>
<td>• Inability to effectively increase intra-abdominal pressure(1)</td>
<td>• No reflex response to increased intra-abdominal pressure(1)</td>
</tr>
<tr>
<td>• Rectal hyperreactivity(4)</td>
<td>• Decreased rectal tone(4)</td>
</tr>
<tr>
<td>• Loss of rectal sensation(1)</td>
<td>• Reduced anorectal sensation(4)</td>
</tr>
<tr>
<td>• Loss of voluntary sphincter control(4)</td>
<td>• Loss of voluntary sphincter control(4)</td>
</tr>
<tr>
<td>• Hypertonic external anal sphincter(1)</td>
<td>• Absent external anal sphincter tone(1)</td>
</tr>
<tr>
<td>• Anorectal dyssynergy(1)</td>
<td>• Rectal faecal impaction(5)</td>
</tr>
<tr>
<td>• Faecal impaction in the proximal colon(5)</td>
<td></td>
</tr>
</tbody>
</table>
4. BOWEL MANAGEMENT

4.1 Goals of Bowel Management

The goals of bowel management following SCI are:

- self-management of regular and predictable bowel emptying at a socially acceptable time and place
- using a minimum of physical and pharmacological interventions to achieve complete bowel emptying within an acceptable timeframe
- the prevention of bowel accidents, constipation, autonomic dysreflexia (which can be life threatening) and other complications.

4.2 Initial Bowel Management

During the first few days following SCI the person needs to be observed for the onset of paralytic ileus. The signs of an ileus may be clinically evident within minutes of cord injury or may be delayed for up to 48 hours. Unrecognised paralytic ileus can have serious consequences, particularly in a person with tetraplegia where decreased cough may lead to aspiration of gastric contents. Progressive abdominal distension may contribute to ventilatory insufficiency by compressing the diaphragm and limiting its excursion. The paralytic ileus generally lasts 48-72 hours, during which time the person is kept nil by mouth with a nasogastric tube inserted to decompress the stomach and intravenous fluid therapy to maintain hydration. For the duration of the paralytic ileus, it is important to check the rectum for the presence of stool on a daily basis and if present gently remove manually using a water-based lubricant. When bowel sounds have returned and flatus has been passed after resolution of the paralytic ileus, gradually re-introduce fluids and food, and commence a bowel management program.

4.3 Long Term Bowel Management

Self-management is the key to successful long term bowel management following SCI. This starts with education about the anatomy and physiology of the gastrointestinal tract, how SCI impacts on defaecation, common bowel problems following SCI, the role of diet, fluid intake, activity/exercise, medication side-effects, the common components of and how to establish an effective bowel management program. As defaecation can be a sensitive topic, it is important to take this into account when planning and undertaking education about this topic.

Each person’s bowel management program typically includes several components. Assessment is the key to the selection of the components required to achieve the goals of bowel management following SCI. While bowel management is personalised for each person, to achieve the right consistency, at the right time and in the right place the following factors should be taken into account for all individuals:

- the type of bowel dysfunction (see Table 1), which is determined by clinical examination
- co-morbid pathologies of the gastrointestinal tract;
- medications (and their side-effects)
- functional ability, particularly mobility, transfers, sitting balance, arm reach and hand function
- cognitive ability
- personal factors such as diet, fluid intake, food preferences, activity/exercise patterns, lifestyle, motivation, problem solving skills
- history of previously tried bowel management regimes
- availability of a carer with the required skillset.

The components of a bowel management program can include optimising dietary and fluid intake, oral laxatives, stimulation of the gastrocolic reflex, optimal positioning, abdominal massage, manual perianal/rectal stimulation, suppositories and enemas, manual removal of faeces and surgical options. Each component needs to be considered in isolation as well as in interaction with the other components to achieve the optimal program.

Multifaceted programs are the norm (8), with a stepwise protocol recommended. (9) A period of trial and error is often required to determine the right mix of components for an individual. Most importantly, changing one component at a time, although time-consuming, is the best way to determine the effectiveness of any changes. Wait three to four bowel cycles before making another change.
4.3.1 Optimising Dietary and Fluid Intake

Adequate nutrition is vital for good health and wellbeing. Individualised dietary management by a dietician is recommended for all patients with SCI. The level of SCI, a person’s pre-morbid bowel habits and any pre-existing medical conditions may all influence a patient’s pattern of bowel evacuation post-injury. As a result successful bowel management needs to have a multifaceted approach.

Dietary fibre, the indigestible cell wall component of plant materials, plays an important role in human health and bowel habits. It has been shown to help prevent or treat hyperlipidaemia, cardiovascular disease, hypertension, obesity, certain cancers, gastrointestinal disorders, and diabetes in the general population. There is currently limited evidence for specific dietary fibre recommendations for patients with SCI. In practice an initial fibre intake of 15g per day is recommended, with gradual increases up to 30g per day of fibre, as tolerated from a variety of sources. A fibre intake of 15g per day may be associated with significant improvements in bowel function. However, a fibre intake greater than 20g per day may be associated with delayed intestinal transit times in persons with SCI.

Dietary fibre can be found in fruits, vegetables, legumes, nuts and seeds as well as wholegrain breads and cereals. Most sources of dietary fibre tend to have a combination of both soluble and insoluble fibre in varying proportions. By encouraging a diet that contains adequate serves of grain (cereal) foods, fruits and vegetables an individual will meet the minimum 15g fibre recommendation.

Adequate fluid intake is also important in bowel management as it promotes transit by keeping the stool soft. Fluid recommendations need to be assessed on an individual basis, as certain patients may require fluid restrictions or additional fluid depending on their medical background, level of physical activity, metabolism and exposure to hot environments.

The Consortium on Spinal Cord Medicine recommend that fluid intake should be approximately 500ml/day greater than the standard guidelines used to estimate the needs of the general public (for example: 1ml of fluid/kcal of energy needs + 500ml). This is because the prolonged colonic transit time typically seen in individuals with neurogenic bowel can result in excessive fluid reabsorption and the formation of hardened stools. However, this recommendation is based on expert consensus only and there is no scientific evidence to support this recommendation.

The National Health and Medical Research Council recommend an adequate intake of 2.6L of fluid a day for men and 2.1L of fluid a day for women (from plain water, milk and other drinks). The adequate intake of total water from food and fluids is set at 3.4L for men and 2.8L for women. In clinical practice 35ml/kg or 1ml/kcal may also be used. Patients should be encouraged to drink plain water as their main fluid. Further research is required to assess fluid requirements in the SCI population.

4.3.2 Oral Laxatives

Stool softeners (e.g. Coloxyl), stimulant laxatives (e.g. Bisacodyl) and bulking agents (e.g. Metamucil, Fybogel, or Normafibre) are often used. Consider the timing of planned bowel emptying, patient diet, assessment of stool type and history of bowel habits prior to changing bowel regime or commencing new products. Commence or change bowel medications one at a time and wait three to four bowel cycles before evaluating the effect. The time of action for each product should be considered in order to promote optimal timing of bowel emptying, for example, stimulant laxatives should be taken 8-12 hours before bowel emptying is planned to help increase colorectal contractions.

Stimulating the gastrocolic reflex by eating or drinking 20-30 minutes before bowel emptying is planned promotes mass movement of the stool through the bowel. Consider planning bowel care after breakfast to promote the gastrocolic reflex after a period of fasting. Assuming a position as close as possible to optimal positioning for defaecation (over the toilet with knees flexed and the upper body bending forward supported by elbows or hands on knees) will aid defaecation.

4.3.3 Abdominal Massage

Abdominal massage is reported to increase the frequency of bowel movements by stimulating movement of stool through the colon, although the level of evidence is poor. Massage is applied to the abdomen following the length of the colon in a clockwise direction. Pressure is applied and released firmly but gently, using the back or heel of the hand or using a tennis ball.
4.3.4 Digital Stimulation

A manual perianal/rectal stimulation technique is used to facilitate rectal emptying by increasing reflex muscular activity in the rectum, increasing rectal pressure and relaxing the external anal sphincter. Because digital rectal stimulation relies on preserved reflex bowel activity, it is only effective for the upper motor neuron bowel. Digital rectal stimulation can be performed by gently inserting a gloved lubricated finger to the middle joint of the finger through the anus into the rectum and slowly rotating the finger in a circular motion maintaining contact with the rectal mucosa. Rotation is continued until flatus or stool passes or the internal sphincter relaxes. In practice, digital stimulation takes 15-20 seconds, and stimulation longer than one minute is seldom necessary. Digital stimulation is repeated approximately every 5-10 minutes until stool evacuation is complete.

4.3.5 Suppositories and Enemas

These are commonly used, although glycerine suppositories are preferred; they stimulate preserved reflex action and lubricate the stool. Small volume enemas (e.g., Microlax enema) and transanal irrigation are less commonly used, although recent studies demonstrate transanal irrigation improves constipation and reduces faecal incontinence as well as reduces time spent on bowel care. Conduct a PR assessment prior to inserting suppository or enema to avoid insertion directly into faeces and ensure lubrication of the mucosa is maximised.

4.3.6 Manual Removal of Faeces

This is the removal of faeces using a lubricated gloved finger inserted through the anus to break up and remove faeces from the rectum. Most commonly used for the LMN bowel, manual removal of faeces needs to be done gently and sensitively. Position the person in the left lateral position or over the toilet and make sure the finger to be used for manual removal has a short fingernail (not extending beyond the tip of the finger) with no jagged edges. Slowly and gently insert a well lubricated, single gloved finger through the anus into the rectum. Gently remove small sections of stool at a time until the rectum is empty, avoid using a hooked finger as this can damage the rectal mucosa and overstretched the anal sphincter. If the stool is hard, impacted or difficult to remove, consider other approaches in conjunction with digital removal of faeces. If the patient experiences symptoms of autonomic dysreflexia during this procedure consider using local anaesthetic gel. Conduct a PR assessment 5 minutes after the emptying of the rectum to ensure the evacuation is complete.

4.3.7 Surgical Options

Several surgical options have also been used for bowel management following SCI. These include the implantation of electrical stimulation systems, the formation of an elective colostomy and the formation of an appendicostomy for the purposes of antegrade enema administration. Surgical options should only be considered after other options have been exhausted; expert advice should be sought if these procedures are being considered.

While self-management is the ideal, the reality is that following SCI not all people have the residual function to perform their own bowel care procedure. This does not preclude the person from taking responsibility for decision making. Therefore self-determination needs to be encouraged at every opportunity, particularly during the training of personal carers.

4.4 Trouble Shooting

Table 2 presents information about common problems associated with neurogenic bowel following SCI and their management.
Pharmaceutical Benefits Scheme (PBS) bowel preparations to assist with the management of a bowel program are available free under the Paraplegic and Quadriplegic Program provided the individual is a member of an authorised association and has neurological loss resulting in paraplegia or quadriplegia. The individual must also be eligible for Medicare (Phone 02 8741 5600 or free call outside metro area 1300 886 992 or Fax 1300 886 602).

The Continence Aids Payment Scheme (CAPS) is an Australian Government payment that assists eligible people, who have permanent and severe incontinence to meet some of the cost of their continence products. It is a direct payment administered by Medicare to clients providing flexibility and choice about where and when they purchase their continence products. Supplies can also be obtained through EnableNSW. EnableNSW provides assistance for consumers requiring aids for continence problems. EnableNSW policy requires eligible consumers to use CAPS assistance each year before accessing assistance through EnableNSW.

TABLE 2 – Common problems associated with neurogenic bowel following SCI\(^{24, 25}\)

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>RECOMMENDATION</th>
<th>NOTES</th>
</tr>
</thead>
</table>
| Autonomic dysreflexia | • Nociceptive stimulus below SCI level triggers excessive reflex activity of sympathetic nervous system and secondary parasympathetic activity.  
• Constipation.  
• Rectal distension (high volume enemas, digital stimulation/removal).  
• Enlarged haemorrhoids.  
• Irritation from enema.  

| | • Autonomic dysreflexia during bowel care is usually temporary and resolves without lasting effects. If signs and symptoms occur reduce digital stimulation.  
• Review bowel care techniques.  
• Avoid constipation.  
• Consider using topical anaesthetic gel (2% lignocaine) inserted into the rectum 5 minutes prior to digital stimulation and manual evacuation.  

| | • Signs and symptoms may include any of the following:  
| | Sudden hypertension; pounding headache; bradycardia; flushing/blotching of skin above SCI level; profuse sweating above SCI level; skin pallor and piloerection below SCI level; chills without fever; nasal congestion; blurred vision; shortness of breath; sense of apprehension or anxiety. |
| Soft, poorly formed stool (loose or diarrhoea) | • Excess fluid intake.  
• Alcohol intake can affect consistency of the stool.  
• Medications especially antibiotics.  
• Diet (e.g. poor soluble fibre intake, fatty, spicy or greasy foods, and caffeine may cause diarrhoea).  
• Gastrointestinal illness.  

| | • Review fluid and dietary fibre intake.  
• Review medications and aperients. Stool softener dosage is individual and too much can often be a problem.  
• Consider adding or increasing bulking agents.  
• Use a food diary to record foods and the outcomes of stool consistency.  
• Consider stool culture and Clostridium difficile if recently on antibiotics.  
• If unresolved, medical review is indicated.  

<p>| | • Review stool softener dosage before increasing fibre or bulking agents, which should be done gradually to allow the bowel to adjust, which will in turn prevent bloating and intestinal wind/gas. |</p>
<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>RECOMMENDATION</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard, dry and pebbly stool (constipation)</td>
<td>• Poor fluid intake (&lt;1.5L). Caffeine and alcohol may have a diuretic action. Excess insensible fluid loss (perspiration and vomiting). • Low insoluble fibre diet. • Insufficient stool softeners and/or bulking agents. • Medication side-effects.</td>
<td>• Increase fluid intake (&gt;2L/day). • Increasing insoluble fibre in diet will improve the consistency of stools. • Increase softeners and stimulants or decrease bulking agents. • Review and rationalise medications (e.g. narcotic analgesics, iron, and anticholinergics). • Review the frequency of bowel care if less than daily.</td>
<td>• If fibre is increased in the diet then fluid intake should also be increased. • Stool softeners and stimulants should be taken at the same time each day in order to ensure maximum effect at the desired time. Stimulants should be taken 8-12 hours before bowel care. • It appears that there is a positive association of frequency of constipation with time since injury. This may indicate a change.</td>
</tr>
<tr>
<td>Alternating diarrhoea and constipation (indicates impaction)</td>
<td>• Irregular bowel regimen. • High impaction with spurious diarrhoea. • Bowel pattern may be changing.</td>
<td>• Abdominal x-ray may help to confirm diagnosis. • In addition to the recommendations for constipation (above), ensure aperients are taken on a regular basis (i.e. twice per day). • Start a bowel chart and review if bowel routine is inadequate.</td>
<td></td>
</tr>
<tr>
<td>Faecal incontinence (accidents)</td>
<td>• Insufficient time for bowel care or insufficient evacuation. • Stool too soft. • Certain irritant enemas or suppositories can cause incontinence or residue later in the day. • Change in diet. • Excessive digital stimulation can overstimulate the large bowel causing it to secrete mucous and contract causing incontinence.</td>
<td>• Allow sufficient time for bowel care. • Review carer’s bowel management practices. • Review aperients and enema or suppository use. • Consider the use of an anal plug (for flaccid bowels).</td>
<td>• The use of anal plug may cause autonomic dysreflexia, so should be used with caution.</td>
</tr>
<tr>
<td>Haemorrhoids</td>
<td>• Exacerbated by manual procedures (digital stimulation and manual removal of faeces), enemas and constipation.</td>
<td>• Review rectal stimulant.</td>
<td></td>
</tr>
</tbody>
</table>
6. WHO TO CONTACT FOR ADVICE

- Local community health nurses.
- Local continence advisers.
- National Continence Helpline: 1800 330 066
- ParaQuad NSW: 02 8741 5600
  (Information line: 1300 886 601)
- Hunter Spinal Cord Injury Service: 02 4925 7888
- NSW Spinal Outreach Service: 02 9808 9666
- Royal Rehab Spinal Cord Injury Unit: 02 9808 9300
- RNSH Spinal Cord Injury Unit: 9463 1799
- POWH Spinal Cord Injury Unit: 02 9382 2222
7. QUIZ

Q1. A person with an upper motor neuron lesion typically presents with:
   a) Absent anal and bulbo-anal reflex, decreased rectal tone and absent external anal sphincter tone;
   b) Positive anal and bulbo-anal reflex, rectal hyperreactivity and hypertonic external anal sphincter;
   c) Absent anal and bulbo-anal reflex, rectal hyperreactivity and hypertonic external anal sphincter;
   d) Positive anal and bulbo-anal reflex, decreased rectal tone and absent external anal sphincter tone;
   e) Absent anal and bulbo-anal reflex, rectal hyperreactivity and absent external anal sphincter tone.

Q2. Manual perianal/rectal stimulation technique is used predominantly to facilitate rectal emptying in patients with:
   a) Lower motor neuron lesion;
   b) Upper motor neuron lesion;
   c) Both upper and lower motor neuron lesion;
   d) Incomplete lesions only;
   e) Complete lesions only.

Q3. The aim of bowel management for lower motor neuron bowel is:
   a) Bristol stool type 3, second daily evacuation of faeces;
   b) Bristol stool type 4, daily or second daily evacuation of faeces;
   c) Bristol stool type 5, once or twice daily evacuation of faeces;
   d) Bristol stool type 3, once or twice daily evacuation of faeces;
   e) Bristol stool type 2, daily or second daily evacuation of faeces.

Q4. Which of the following are not usual signs or symptoms of autonomic dysreflexia:
   a) Sudden hypertension and pounding headache;
   b) Profuse sweating above SCI level;
   c) Skin pallor and piloerection below SCI level;
   d) Sense of apprehension or anxiety;
   e) Febrile, nausea and vomiting.

Q5. A clinician should consider which of the following for a person who has hard, dry and pebbly stools (Bristol stool type 1):
   a) Decrease fluid intake
   b) Decrease stool softeners
   c) Decrease insoluble fibre
   d) All of the above
   e) None of the above

QUIZ ANSWERS:
Q1. B
Q2. B
Q3. D
Q4. E
Q5. E

Healthcare advice:
- Febrile, nausea and vomiting
- None of the above
- O2. B - Upper motor neuron lesion
- O3. D - Bristol stool type 3, once or twice daily evacuation of faeces
- O4. E - Piloerection and hypertonic external anal sphincter
- O5. E - Positive anal and bulbo-anal reflex, rectal hyperreactivity and hypertonic external anal sphincter
8. REFERENCES


15. Academy of Nutrition and Dietetics: Evidence Analysis Library. What level of fibre is recommended to manage neurogenic bowel in spinal cord injury patients; and how should it be introduced? http://andevideolibrary.com/template.cfm?key=2282 (Accessed January 2014)


