Guidelines for Management of Neurogenic Bowel Dysfunction in Individuals with Central Neurological Conditions

Initiated by the Multidisciplinary Association of Spinal Cord Injured Professionals

Supported by Coloplast

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1. Preface

Dear Colleague

Changes in bowel function and control have a considerable impact on the quality of life of individuals with central neurological conditions. Among individuals with spinal cord injury, for example, loss of bowel control is often seen as more significant than loss of ambulation. Managing this change in function has implications for independence and autonomy, community integration and long term health for the affected individual. It is therefore an important area of care and rehabilitation.

The purpose of these guidelines is to bring together the research evidence and current best practice to provide support for healthcare practitioners involved in the care of individuals with a range of central neurological conditions. While most research evidence around neurogenic bowel management is related to individuals with spinal cord injury, the principles identified can be applied to individuals with other conditions with appropriate assessment and evaluation; hence this document has been expanded to reflect the needs of a wider neurological patient population.

This document provides guidance, standards, protocols and information to support appropriate effective and individualised bowel management which respects the dignity of the individual, in all settings where people with central neurological conditions receive care.

I would like to acknowledge the invaluable support given by Coloplast Limited through an educational grant.

The guidelines will be reviewed again in 2 years – 2014. Feedback and comment on this current version is very welcome.

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2. Introduction/purpose

Damage to the central nervous system (brain and spinal cord) has a profound impact on the function of the large bowel and on the maintenance of faecal continence.

Stool transit through the bowel may be slowed placing the individual at high risk of constipation. Sensory and motor control of the ano-rectum may be impaired leaving the individual with reduced or absent voluntarily control of the process of defaecation. This combination of impaired continence and risk of severe constipation is termed neurogenic bowel dysfunction. Without intervention, the individual may be incontinent of faeces and chronically constipated, with all the reduced quality of life, social impacts and secondary complications that this implies. Problems with such a socially unacceptable and taboo area of bodily function often result in social isolation and impact on all aspects of life, including self concept and sexuality. The function of the large bowel must be actively managed to allow the individual some degree of continence and to minimise associated quality of life and health problems.

The purpose of these guidelines is to support the planning, implementation and evaluation of practical bowel management for individuals with central neurological conditions including:

- spinal cord injury (traumatic or non-traumatic including infection, inflammation, vascular events or malignancy; the term spinal cord injury (SCI) will be used throughout the document to represent spinal cord damage of any aetiology)
- multiple sclerosis (MS)
- spina bifida (SB)
- cauda equina syndrome (not strictly damage to the central nervous system but closely related symptoms)
- cerebral palsy (CP)
- stroke
- Parkinson's Disease (PD).

While the presentation of bowel dysfunction in these conditions may vary, the underlying cause is the same – damage to the nervous system control of the bowel. Most evidence for managing these problems is found in the literature around spinal cord injury. With appropriate assessment and evaluation, this knowledge can be applied to helping individuals with bowel dysfunction due to other central neurological conditions.

3. Quick guide to neurogenic bowel management

What neurogenic bowel function does the patient have?

Sensory function?

If sensation is present in the saddle area around the perineum, ano-rectal sensation is usually present. If sensation is present, digital interventions may be uncomfortable; rectal stimulants (suppositories, enemas) may cause less discomfort.

Motor function?

Reflex bowel function	Areflexic (flaccid) bowel function
Positive anal reflex (anal wink) – visible contraction of anus in response to pinprick of surrounding skin	No anal reflex (anal wink)
Positive bulbo-anal reflex – contraction of anus in response to pressure on glans penis/clitoris	Absent bulbo-anal reflex
Injury/damage to spinal cord/brain at or above twelfth thoracic vertebra, reflex or spastic paralysis	Injury/damage to conus or cauda equina, at or below first lumbar vertebra, flaccid paralysis

Outline bowel management programmes

Reflex bowel	Areflexic (flaccid) bowel
Daily or alternate days	**Once or more daily**
(Aim for Bristol Scale 4 stool) Stimulant laxative 8-12 hours before planned care if necessary ↓	(Aim for Bristol Scale 3 stool) Stimulant laxative 8-12 hours before planned care if necessary ↓
Gastrocolic reflex ↓	Gastrocolic reflex ↓
Rectal stimulant suppository/microenema ↓	Abdominal massage ↓
Abdominal massage ↓	Digital removal of faeces ↓
Digital rectal stimulation ↓	Single digital check to ensure rectum is empty 5-10 minutes after last stool passed
Digital removal of faeces if reflex evacuation incomplete ↓	
Single digital check to ensure rectum is empty 5-10 minutes after last stool passed	
Medications to adjust stool consistency (e.g. macrogols such as Movicol or Laxido, Lactulose, Fybogel or Dioctyl) should be taken regularly if needed	

4. Guideline summary

In acute onset neurogenic dysfunction (spinal cord injury, cauda equina or stroke) instigate a standardised bowel management plan within 24 hours of admission (see Section 11)

Non-acute – rehabilitation and ongoing management

- Assess the needs of the individual
- Plan bowel management in collaboration with the individual in the context of their goals and intended lifestyle, aiming to promote autonomy and independence
- Evaluate the bowel management programme using objective outcome measures and the subjective views of the individual
- Provide education for the patient and any carers
- Review the bowel programme regularly
- Provide information to empower and promote choice
- Refer on appropriately if the needs of an individual cannot be met in the current setting
- Refer on appropriately where bowel symptoms are not accounted for by neurogenic dysfunction

In the community or during admission to general hospital

- It is recommended as continuing best practice that NHS organisations providing acute care have a policy for manual evacuation of stool and ensure that suitably trained staff are available if the patient needs this (NRLS 2012)
- Failure to meet the needs of individuals for effective bowel management may be seen as neglect, under the definition of abuse in the NMC statement on 'Practitioner-Client Relationships and the Prevention of Abuse' (NMC 2002)
- An appropriate bowel management programme should be maintained during admission to non-specialist acute healthcare settings or in the community setting
- Many individuals with neurogenic bowel dysfunction are experts in their own care (NRLS 2012), and maintenance of an existing effective bowel management programme should be facilitated through access to suitable facilities and provision of any required assistance
- Where the current management is not effective, an alternative programme should be planned in collaboration with the patient to meet the needs identified in the assessment
- Where alteration of an existing programme is required, contact should be sought with the specialist care provider supporting the individual's health needs in relation to their central neurological condition – i.e. for an individual with SCI, their spinal cord injury centre

5. What is neurogenic bowel dysfunction?

A brief overview of normal structure, function and neurological control is followed by a description of neurogenic dysfunction

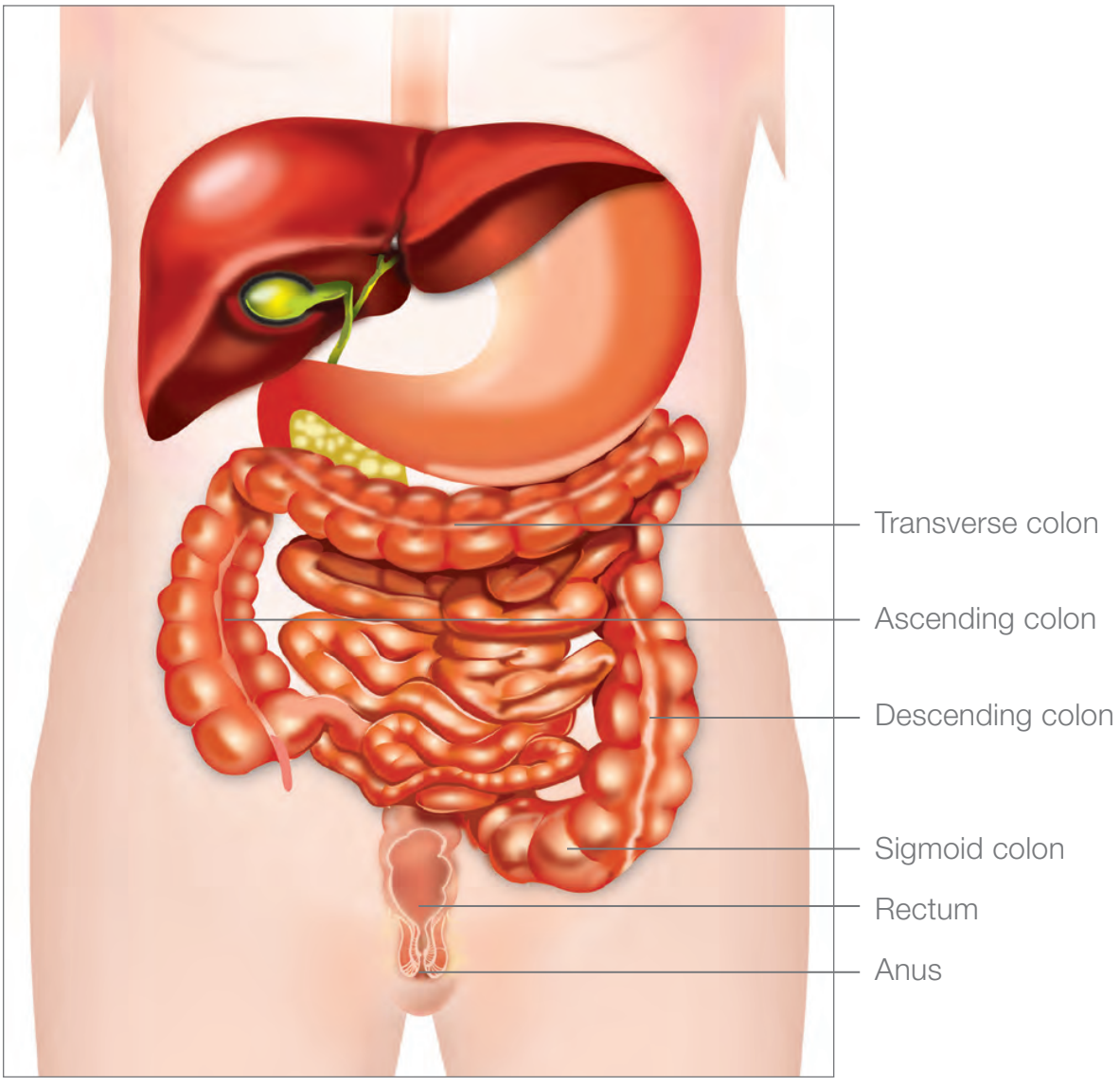


Figure 1: The digestive tract

5.1 Normal colon structure and function

- The large bowel comprises the final part of the digestive tract and is made up of three parts: the colon, the rectum and the anus (**Figure 1**)
  - The colon is a muscular tube around 1.5m long
  - The rectum is the name given to the last 20cm of the large bowel
  - The anus comprises the last 2-5cm of the rectum, composed of two distinct sphincters, internal and external. The internal anal sphincter, composed of smooth muscle (which has inherent tone), is under reflex control; even in the absence of normal external innervation the internal sphincter will have some tone and contractility. The external sphincter, composed of striated muscle (no inherent tone), is under both reflex and voluntary control via somatic lower motor neurones in the pudendal nerve from the sacral cord. In the absence of normal external innervation, the external sphincter will be areflexic

- The intrinsic or enteric nervous system is embedded within the gut wall, as the submucous (Meissner's) plexus and the mucosal (Auerbach's) plexus, and coordinates gut secretion, blood flow and muscular activity. The enteric nervous system gives the colon its inherent ability to produce peristalsis, a wave-like flow of contraction that pushes the stool, in stages, through the bowel towards the anus

- Extrinsic neurological input to the gut is via the autonomic nervous system:
  - Parasympathetic input to the ascending and near transverse colon comes from the vagus nerve, and to the remainder of the colon and anorectum via the sacral roots S2-4 through the pelvic nerves. Increases motility in the gut and relaxes sphincters
  - Sympathetic innervation comes from T6 – L2 nerve roots. Sympathetic activity results in decreased motility and tone in the colon and contracts the sphincters
  - These inputs influence the activity of the enteric system and are themselves modulated by centres in the spinal cord and brain (hypothalamus)

- The functions of the large bowel, or colon, are to:
  - complete the process of digestion through a process of fermentation involving commensal bacteria resident in the colon
  - to form, store and expel faeces from the body, involving absorption of water and minerals

- Stool is moved in and through the bowel by coordinated contractions of the muscle layers of the colon, called peristalsis. The innate rhythmicity within the smooth muscle fibres of the gut arises from the cells of Cajal which generate slow waves which continue in the absence of other neural input (e.g. after complete spinal cord transection)
  - The rhythms and size of these slow waves can be influenced by neuronal inputs and local hormones (Brading and Ramalingham 2006)
  - Almost constant mixing movements, called haustral churning, ensure the frequent presentation and representation of stool to the colonic mucosa thus facilitating absorption of water and minerals
  - Occasional 'mass movements' move the stool a long distance through the colon, always towards the anus. These mass movements occur rarely – two or three times a day, associated with the intake of food and stimulation of the gastro-colic reflex (Chung and Emmanuel 2006)

- Factors which are generally accepted as influencing colonic function in able-bodied people include diet, fluid intake, exercise and emotional and personality factors (Norton 1996, Totora and Agnastakoz 1990)

Defaecation

- A reflex activity under voluntary control
- A 'mass movement' delivers stool to the rectum, which is usually relatively empty, the rectal walls relax and filling occurs with little rise in pressure initially
- Eventually distension of the rectal wall triggers the recto-anal inhibitory reflex which relaxes the internal anal sphincter. The stool enters the upper anal canal and is sampled by the anal mucosa, allowing discrimination of gas, liquid or solid
- As filling of the rectum continues, nerve impulses are dispatched to the cerebral cortex resulting in conscious awareness of the need to defaecate
- The external sphincter initially contracts reflexly and, if evacuation of stool at that time is appropriate, the sphincter is then voluntarily relaxed; pressure in the sphincter is reduced. Concomitantly, voluntary contraction of the diaphragm and abdominal muscles raise intra-abdominal pressure and trigger peristalsis in the colon and rectum, the internal sphincter relaxes and when rectal pressure exceeds sphincter pressure, defaecation occurs (Brading and Ramalingham 2006)

- Powerful contractions of the rectum ensure evacuation of stool, maintained by sensory feedback from the anus until the rectum is empty (Emmanuel 2004, Tortora and Agnastakos 1990)
- If the external anal sphincter is not voluntarily relaxed defaecation will be postponed. This can be supplemented by a voluntary anal squeeze
- This complex process relies upon the existence of intact reflex arcs between the colon and spinal cord, and intact voluntary pathways between the ano-rectum and the hypothalamus

5.2 Definition of neurogenic bowel dysfunction

'Neurogenic bowel' is the term used to describe dysfunction of the colon (constipation, faecal incontinence and disordered defaecation) due to loss of normal sensory and/or motor control or both (Chung and Emmanuel 2006), as a result of central neurological disease or damage. Damage to the spinal cord and brain interrupts the neural pathways described above and the outcome will vary depending on the location and severity of the damage. Neurogenic function may be reflex, areflexic or mixed.

The spinal cord ceases at the bony level of the junction of the first and second lumbar vertebrae. The area directly below, the tip of the spinal cord, is called the conus medullaris. The nerves travelling within the spinal canal below the conus medullaris constitute the cauda equina.

- Reflex bowel dysfunction: results from damage to the brain or spinal cord above an undamaged conus medullaris - there is:
  - Loss or impairment of sensory perception of the need for defaecation
  - Loss or impairment of voluntary control of the external anal sphincter
  - Intact reflex arcs through the conus medullaris maintain tone (reflex activity) in the anorectum
  - Tone in the external anal sphincter, colonic wall and pelvic floor, is increased resulting in reduced colonic compliance, over-active segmental peristalsis, under-active propulsive peristalsis, spastic external anal sphincter constriction (Banwell et al 1993, Camallieri and Bharucha 1996, Stiens et al 1997). Modulation of colonic motor activity from the brain is lost and peristalsis and haustral movements continue though less effectively
  - Transit (the time taken for stool to pass through the colon) may be slowed throughout the colon (Krogh et al 2000, Leduc et al 1997, Nino-Murcia et al 1990)
  - Discoordination between relaxation of the anal canal and rectal contraction (recto-anal dyssynergia) can occur in individuals with lesions in the upper cord and brain (Nino-Murcia et al 1990) and is common in individuals with Parkinson's Disease
  - Outcome is constipation usually with faecal retention but reflex, uncontrolled evacuation of the rectum can occur. The remaining reflex activity in the anorectum can be utilised to aid bowel management
  - Damage in the thoracic and cervical spinal cord also reduces or eradicates the patient's ability to use the diaphragm and abdominal muscles to voluntarily increase abdominal and therefore rectal pressure

- Areflexic bowel dysfunction: damage to conus medullaris or cauda equina (at or below the first lumbar vertebra)
  - Loss or impairment of sensory perception of the need for defaecation
  - Loss or impairment of voluntary control of the external anal sphincter
  - Autonomic motor nerves are disrupted due to damage to parasympathetic cell bodies in the conus medullaris or their axons in the cauda equina
  - No spinal cord mediated peristalsis occurs and modulation of colonic motility by the brain is lost, resulting in a loss of effective stool transport in the descending and sigmoid colon and rectum (Banwell 1993)
  - External anal sphincter is denervated and flaccid
  - Pressure in the internal sphincter is reduced, pelvic floor muscles are areflexic allowing the sigmoid colon and rectum to descend into the pelvis, reducing the anorectal angle and opening the rectal lumen. The outcome is a high risk of faecal incontinence through the lax sphincter, as well as constipation (Steins et al 1997)
  - Colonic transit time through descending colon, sigmoid and rectum is considerably increased (Krogh et al 2000, Leduc et al 1997, Nino-Murcia et al 1990) contributing to constipation.

6. What are the clinical outcomes and complications of neurogenic bowel dysfunction?

6.1 Reduced quality of life

Delisa and Kirshblum (1997) suggest that 'establishing an effective bowel program is critical because incontinence may interfere with a patient's physical, psychological, social, recreational and sexual function' (page 388). This statement emphasises the all-pervasive influence of neurogenic bowel dysfunction on the life of the individual. If the affected individual is to maintain or return to an active role in the community – to work, study, to fulfil their role as parent or partner, to lead a full and socially engaged life – a bowel management program that is effective, timely and sustainable is essential. An effective programme requires considerable resources in terms of time, effort and self-discipline and possibly the input of a carer; for many individuals the fear of faecal incontinence is an added, ever present anxiety. The effects of neurogenic bowel dysfunction on the quality of life in this population are widely acknowledged and include loss of independence and social isolation (Emmanuel 2010, Byrne et al 1998, Correa and Rotter 2000, Glickman and Kamm 1996, Stiens et al 1997). It is not just actual faecal incontinence but fear of incontinence and the impact of managing the problem that impair quality of life. Neurogenic bowel dysfunction may lead individuals to curtail everyday activities outside the home or they may constantly 'scan' the environment when outside the home to ensure prompt location of public toilets (Collings and Norton 2004). Additionally, a neurogenic bowel is the source of considerable morbidity including haemorrhoids, abdominal pain, faecal impaction, rectal bleeding, rectal prolapse, anal fissure, bloating, nausea, autonomic dysreflexia and prolonged evacuation which all impair quality of life (Correa and Rotter 2000, De Looze at al 1998, Han et al 1998, Harrari et al 1997, Lynch et al 2001, Menter et al 1997). These problems can result in hospital admission for impaction, megacolon, constipation and volvulus more than twice as often as individuals without neurogenic bowel dysfunction (Sonnenberg et al, 1994).

6.2 Faecal Incontinence

Faecal incontinence is defined by the International Consultation on Incontinence as "the involuntary loss of flatus, liquid or solid stool that is a social or hygienic problem" (Norton et al 2009). Due to its social unacceptability, it is a deeply distressing problem, affecting between 1-10% of the general adult population (Perry et al 2002, Macmillan et al 2004, Whitehead et al 2009). It is far more common among individuals with central neurological conditions; 34-53% of individuals with spina bifida (McDonnell and McCann 2000, Verhoef 2005), 56% of individuals with cerebral palsy (Turk 1997), 30% of individuals following stroke (Harari 2003), 20-50% of individuals with MS (Hennessey 1999,Chia et al 1995, Hinds et al 1990) and 75% of individuals with spinal cord injury report faecal incontinence.
Contamination from stool may lead to an increase in urinary tract infections and cause damage to skin either directly or due to wearing pads. National Institute for Clinical Excellence (2005) highlights incontinence as a risk factor in the development of pressure ulcers.

6.3 Constipation

There is no universally agreed definition of constipation but it is associated with having infrequent bowel movements (usually suggested to be fewer than three per week), hard dry stools, sometimes small in size, which are difficult to eliminate i.e. Bristol Stool Form Scale type 1-2 (Heaton et al 1992). Constipation is associated with rectal and abdominal pain, painful defecation, difficulty with evacuation, straining at stool, bloating, prolonged evacuation, faecal incontinence and a sensation of incomplete evacuation. Constipation is common in neurogenic bowel dysfunction, reported by 40-54% of individuals with MS (Chia 1995, Hennesey et al 1999), 39-58% of individuals with SCI (Coggrave 2009, Han 1998, Kirk 1997) and 50% of individuals with Parkinson's Disease.

Constipation in this patient group is attributed to a slowing in gut transit due to interruption of nerve pathways compounded by disability-associated changes in mobility, spasticity, fatigue, concomitant use of multiple medications (polypharmacy) and inadequate fibre or fluid intake (Emmanuel 2010). In individuals with Parkinson's Disease, recto-anal dyssynergia is thought to contribute to constipation.

6.4 Faecal impaction

Faecal impaction is not well defined but 'copious formed stool in the colon (not just the rectum) which is not progressing through the colon or which cannot be expelled from the rectum are salient symptoms' (Coggrave and Emmanuel 2010). Impaction is common in this patient group and may rarely lead to stercoral ulceration and spontaneous bowel perforation (Banwell 1993). Symptoms may include absent or reduced evacuation of stool for a longer period than usual for the individual, abdominal bloating or distention, nausea and pain. Impaction may be accompanied by 'overflow' or 'spurious' diarrhoea where looser stool leaks around an unmoving faecal mass, often associated with faecal soiling. Impaction in individuals with compromised respiratory function as in high level SCI may result in breathlessness due to reduced diaphragmatic excursion. Stool will usually be Bristol Scale 1-2 but soft-impaction with putty-like stool may occur, associated with high fibre diet or bulking laxatives in immobile individuals (Coggrave and Emmanuel 2010). Susceptible individuals may demonstrate symptoms of sub-acute autonomic dysreflexia.

6.5 Haemorrhoids

An inflammation and swelling of veins in the anal cushions, a highly vascular area of tissue just inside the anus. Internal haemorrhoids may protrude (prolapse) through the anus. Most prolapsed haemorrhoids will shrink back of their own accord but those that prolapse permanently (3rd degree) may require treatment. Prolapsed haemorrhoids may leave empty redundant skin behind (skin tags) which can cause irritation. Haemorrhoids present with bright red blood on the stool or toilet paper, or the gloved finger after evacuation or digital rectal stimulation, and may cause pain, itching and autonomic dysreflexic symptoms in individuals with SCI above the sixth thoracic vertebra. Haemorrhoids are associated with chronic constipation or diarrhoea, straining at stool, prolonged toileting and low dietary fibre intake and become more common with age and in pregnancy (see glossary for grading). They are very common in individuals with neurogenic bowel dysfunction - reported by around 40% of individuals with SCI (Coggrave 2009). The individual should be referred to an appropriate specialist for assessment and treatment if the haemorrhoids become problematic.

6.6 Megacolon/megarectum

This term describes an abnormally distended colon or rectum seen as dilated gas-filled loops on xray. It is associated with older age (greater than 50 years), longer duration of spinal injury (10 years or longer) and symptoms of abdominal distension, pain and constipation, use of multiple laxatives, anticholinergic medication and use of calcium-containing antacids. It may underlie the deterioration in bowel function often seen in chronically spinal cord injured individuals, manifesting as prolonged duration of management and difficulty with evacuation. The condition is relatively common, and may be associated with sigmoid volvulus, faecal impaction, autonomic dysreflexia, dyspnoea from diaphragmatic splinting, weight loss and chronic malnutrition. It is also seen in younger individuals with spina bifida where bowel function has not been managed effectively from an early age (Shepherd et al 1983). Colostomy may be considered where these complications result in recurrent hospitalisations (Harrari and Minaker 2000).

6.7 Rectal Prolapse

This term refers to one of three entities: full-thickness rectal prolapse where the full-thickness of the bowel wall protrudes through the anus; mucosal prolapse where only the mucosa protrudes; or internal prolapse or intussusception where the collapsed tissue "telescopes" on itself but remains within the colon. The individual may report a mass protruding from the anus after evacuation which may retract spontaneously or require reduction manually. External prolapse often results in faecal incontinence and increased mucous production/leakage resulting in wetting and soiling of clothing. Internal prolapse may cause a feeling of incomplete evacuation (Medscape Reference Drugs, Diseases and Procedures 2010, accessed Feb 2012). Prompt onward referral for a surgical opinion is essential.

6.8 Anal fissure or tear

A tear or linear ulcer in the skin lining in the anal canal (NHS Clinical Knowledge Summaries (CKS) 2011, Gordon and Nivatvongs 2007). Anal fissure can be extremely painful (Steggall 2008) in those with intact sensation. Anal pain occurs with defecation and is severe and sharp on passing a stool, commonly followed by deep burning pain

that can persist for several hours afterwards. In patients with impaired sensation this may manifest as increased spasm and autonomic dysreflexia in those susceptible. Bleeding may occur with defecation and is usually seen as a small quantity of bright red blood on the stool or toilet paper. External examination of the anus carried out by gently parting the buttocks may reveal a superficial tear with clean edges if the fissure is acute (present up to 6 weeks); if chronic (present more than 6 weeks) the tear will be deeper and wider with muscle fibres at the base. There may be a skin tag if the fissure has been long standing. Primary fissures are associated with increased anal tone which also hinders healing, secondary fissures are related to passage of constipated stool in this patient group (Derbyshire 2007). For fissures present more than 1 week, glyceryl trinitrate 0.4% rectal ointment daily for up to 8 weeks may be prescribed to reduce anal tone and speed healing but with a 50% risk of associated headache (NHS CKS 2011). The individual's bowel management should be reviewed and evaluated to ensure that constipation is eradicated and that digital interventions are used appropriately.

6.9 Autonomic Dysreflexia

Autonomic dysreflexia is an abnormal sympathetic nervous system response to a noxious stimulus below the level of injury in individuals with SCI above the sixth thoracic vertebra. An acute episode results in rapidly rising blood pressure with accompanying risk of brain haemorrhage and death (Kavchak-Keyes 2000) and is regarded as a medical emergency. Among susceptible individuals, 36% report dysreflexic symptoms occasionally and 9% always when they conduct bowel management (Coggrave et al 2008). The higher the level of spinal cord injury, the greater the risk of autonomic dysreflexia and the more severe the symptoms. Raised blood pressure during bowel management without symptoms has been recorded (Furusawa 2007, Kirshblum 2003). However, treatment is not necessarily required in the absence of symptoms (Kirshblum 2003), hence recording blood pressure when undertaking this intervention has little benefit. The patient should be observed for symptoms of autonomic dysreflexia which include flushing, sweating and blotchiness above the lesion, chills, nasal congestion and headache. Some individuals experience these symptoms mildly whenever they evacuate their bowel. Less often, where the bowel is loaded with constipated stool or severe haemorrhoids or anal fissure are present, acute autonomic dysreflexia may occur in response to bowel care. Bowel distension caused by impaction, rectal stimulation, suppository insertion and enemas have all been reported as triggering autonomic dysreflexia (Colachis 1992). The cardinal sign of acute autonomic dysreflexia is a rapidly developing severe headache. In this instance bowel management should be stopped and a medical assessment undertaken. If acute autonomic dysreflexia persists after stopping the procedure this should be treated promptly, according to local policy, but usually using sublingual nifedipine or a glycerine trinitrate patch or spray. Ano-rectal problems should be treated appropriately and steps should be taken to ensure that the bowel care programme is effective and any faecal loading or constipation is eradicated. Bowel management must still be continued on a regular basis; local anaesthetic gel, applied prior to digital interventions may reduce or eradicate the autonomic dysreflexic response during bowel care (Cosman 2005), though this is not suitable for prolonged use (BNF 2008). Autonomic dysreflexia associated with bowel management is most likely to occur in response to ineffective bowel care due to withholding of essential interventions.

7. What is neurogenic bowel management?

‘Bowel management’ is the regular delivery of a programme of planned interventions designed to pre-emptively achieve effective bowel evacuation at a specific frequency in individuals with central neurological conditions, reducing its impact on quality of life by avoiding faecal incontinence and constipation, minimising associated morbidity and facilitating carer input where required

7.1 Aims of neurogenic bowel management

The aims of bowel management in central neurological conditions are to:

- avoid faecal incontinence
- minimise or avoid constipation
- manage evacuation within a reasonable time, generally suggested to be up to one hour (Stone 1990)
- optimise comfort, safety and privacy
- fit management in with the lifestyle of the individual, enabling activity without fear of faecal incontinence
- provide an effective routine that is acceptable to the individual, promoting autonomy, verbal and, where possible, physical independence
- avoid autonomic dysreflexia and minimise other secondary complications
- achieve regular and predictable emptying of the bowel at a socially acceptable time and place, facilitating the involvement of carers where required
- use the minimum necessary physical and pharmacological interventions
- maintain short and long-term gastrointestinal health
- identify appropriate transfer methods, equipment and adaptive devices that promote independence through multidisciplinary team working
- evaluate the outcomes of bowel management objectively by recording episodes of faecal incontinence, duration of bowel management episodes and stool form as described by the Bristol Stool Form Scale (Heaton 1992)
- through education, to provide the individual with a ‘toolkit’ of knowledge with which they can manage and adapt their bowel care in the long-term

8. Who should assess the individual with neurogenic bowel dysfunction and plan their management programme?

In a healthcare setting, meeting the needs of individuals with central neurological conditions is a multidisciplinary team activity. However, assessment of the patient's bowel care needs and the development and evaluation of a bowel management programme should be undertaken by a specialist healthcare professional with a continence and/or neurology background and suitable skills, knowledge and interest (Wiesel et al 2001). In specialist inpatient settings, such as spinal cord injury centres, or specialist nurses in stroke, MS or PD settings, experienced registered nurses will plan neurogenic bowel management according to established protocols, adapted to meet the needs of the individual, in collaboration with that individual.

Actual day to day bowel care may be delegated to other carers, for instance healthcare assistants and suitably trained carers in hospital and community settings where their competence can be assured (RCN 2008) or to the patient themselves or their family, or their directly employed care-givers. Many individuals will conduct their own care or direct their own care with a high degree of autonomy.

Good practice dictates that any changes to the bowel management plan should not be made without consultation with the individual themselves and where possible and appropriate with the initial assessor or prescriber.

Development of an individualised bowel management programme requires assessment of the individual, planning of interventions and evaluation of outcomes. These activities are cyclical, with regular evaluation and reassessment informing planned care. The cycle continues until an optimal programme has been developed. The need for bowel management is life-long in individuals with neurogenic bowel dysfunction; re-evaluation and modification of the programme will be required at intervals as appropriate (NICE 2007).

8.1 Assessment for bowel care

When assessing the individual for their bowel management and rehabilitation needs the following factors are addressed:

- Current bowel function – sensation of rectal fullness/need for evacuation, voluntary control of anal sphincter, frequency of bowel evacuation, stool consistency
- Bowel habit prior to onset of central neurological condition
- Previous medical history – including obstetric history, chronic bowel disease, cancer, abdominal or anorectal surgery
- Medication
- Diet and fluid intake, ability to eat a full diet, allergies or intolerances
- Level of activity - general mobility, exercise, standing, passive movements
- Level of physical independence – transfer ability, balance
- Communication and cognitive ability
- Level of independence and need for carer input
- Lifestyle and personal goals – cultural, sexual, work or educational roles
- Psychological and emotional factors
- Moving and handling risk assessment
- Home and care circumstances – availability of carers, need for home adaptations, equipment

8.2 Planning care

- Obtain consent - where care is to be given by a carer of any kind, the informed voluntary consent of the individual is essential. Consent should be documented as part of the initial assessment and verbal consent should also be obtained on every occasion that bowel care is given

- Plan appropriate teaching for the individual and for carers as required
- Identify and record timing and location for bowel management – toilet, commode, bed, combination
- Plan a bowel programme, selecting appropriate interventions for evaluation
- Identify need for and organise provision of equipment
- Identify care giver, if required

8.3 Evaluating bowel care

Recording objective outcomes of bowel management is essential during the development of the programme. These are:

- Frequency, timing, volume and stool type of episodes of faecal incontinence (Bristol Stool Form Scale)
- Duration of bowel management episodes
- Stool form recorded using the Bristol Scale
- Frequency of nil results from attempted evacuation
- The Neurogenic Bowel Dysfunction Scale can also be used (Krogh et al 2006)

Additional subjective measures include:

- Does the individual experience a feeling of incomplete emptying?
- Have interventions been minimised as far as possible?
- Is the patient as independent as possible?
- Is the individual satisfied?
- Is the programme sustainable where carer input is required?

8.4 How often should the bowel programme be evaluated?

- In an acute setting – e.g. following spinal cord injury or after a stroke:
  - On cessation of spinal shock in individuals with acute SCI (see glossary for further information on spinal shock)
  - Changes in level of consciousness
  - Changes in physical functioning

- On commencing rehabilitation:
  - When the patient commences mobilisation
  - When the patient is ready to begin bowel management on the toilet/shower chair
  - When the patient is progressing to independent self care
  - If a patient changes to oral intake from nasogastric/gastrostomy feeding
  - If the current routine is ineffective
  - At any time where it seems appropriate but at least fortnightly throughout any acute or rehabilitation admission

- For community living individuals:
  - In individuals with spina bifida assessment for bowel management starts in infancy and includes observation during transition from breast to bottle feeding and during weaning
  - When the current routine is not effective – i.e. faecal incontinence, constipation, prolonged duration (regularly more than 1 hour)
  - In the light of changing levels of independence/dependence
  - During general routine follow-up
  - Following a persistent unexplained change in bowel habit i.e. incontinence, change in stool form, colour or odour or bleeding per rectum. Changes that have persisted for 4 weeks or have not responded to 3 separate adjustments to the usual programme may be indicative of bowel cancer and should be investigated (www.cancerscreening.nhs.uk). Rapid appropriate onward referral for investigation is essential

8.5 Standards for documentation of bowel management (conducted by employed carer)

- Frequency of faecal incontinence will be recorded
- The Bristol Scale will be used to record the outcome of all bowel management episodes
- The duration of all bowel management episodes will be recorded
- Acute setting – documentation of assessment and planned care within 24 hours of admission
- Community living individuals, who receive assistance with bowel management from a district nursing service, will have a documented bowel function assessment and a bowel management plan, available in their own home as well as in appropriate professional records, re-evaluated and documented at least annually

9. Who can give neurogenic bowel care?

Most bowel management is conducted in the community, in people's homes. In this setting bowel management can be carried out by the individual for themselves if physically able or the individual can verbally direct their bowel care when given by another person.

Bowel care, including digital rectal interventions, can be given by a personal assistant (PA), carer, nurse or other person chosen by or acceptable to the individual. A care-giver provided by a statutory agency or care agency should have received appropriate training, provided by a qualified healthcare practitioner competent in this area of care, and be deemed capable to meet the individual's bowel care needs and promote their autonomy. As an employee of a healthcare organisation or agency, the competency of the care giver should be established by the employer and evaluated at regular agreed intervals (CQC 2010); vicarious liability for the employee's actions then lies with the employer.

Where an individual directs their own care and employs personal assistants through the Direct Payments scheme, training of this kind may not be practical. It is for the individual who employs the carer to provide training and to ensure they are satisfied with the capability of the carer.

In the community setting, the individual receiving care also has a responsibility to ensure they are satisfied that the carer is capable of giving their care prior to allowing any interventions to be undertaken for them. Where possible and appropriate the individual who will receive the care should be involved in the training programme of their carer. This will help to ensure a shared understanding of the care to be undertaken.

Care provision in the community must be sustainable and provided in a way that optimises the freedom and flexibility of the individual in order to minimise the impact of bowel dysfunction upon the quality of life of the individual and their family (NMC 2008, RCN 2008, NICE 2007, Williams 2010).

Individuals with central neurological conditions may be admitted to inpatient care settings for many reasons, associated or not with their neurological condition. A bowel management programme which meets the needs of the individual must be maintained during admission to non-specialist acute healthcare settings. Holistic assessment on admission should identify the need for management of neurogenic bowel dysfunction. It is important to recognise that many individuals with neurogenic bowel dysfunction are experts in their own care (NRLS 2012), and an existing effective bowel management programme should be maintained. Where the current management is not effective, an alternative programme should be planned in collaboration with the individual to meet the needs identified in the assessment.

It is recommended as continuing best practice that NHS organisations providing acute care have a policy for manual evacuation of stool and ensure that suitably trained staff are available (NRLS 2012).

Failure to meet the needs of individuals for effective bowel management in any healthcare setting may be seen as neglect, under the definition of abuse in the NMC statement on 'Practitioner-Client Relationships and the Prevention of Abuse' (NMC 2002).

The knowledge and skills required for delivery of bowel management are outlined below. The level a carer is expected to meet will vary depending on their role.

Knowledge required

- Impact of bowel dysfunction and its management on quality of life
- Familiarity with, and acceptance of, the concept of autonomy
- The importance of communication
- Aims of bowel management
- An understanding of the interventions that can be used including the role of oral and rectal medications, in relation to the specific recipient of care or more generally depending on level of responsibility
- The prevention, recognition and management of autonomic symptoms in individuals with spinal cord injuries above the 6th thoracic vertebra
- The recognition of complications such as constipation, faecal impaction, haemorrhoids (piles)
- The importance of hygiene during bowel management and principles of infection control
- Safe disposal of waste

Skills required – independently or under direction

- Effective and appropriate communication including feedback to the individual, and recording of bowel management outcomes
- Use of interventions listed above
- The management of autonomic symptoms and acute autonomic dysreflexia
- Preserving skin integrity during bowel management
- Moving and handling skills
- The use of appropriate equipment

10. What interventions can be used for management of neurogenic bowel dysfunction?

Establishing a regular routine or programme is fundamental to gaining control over continence and avoiding the build up of stool in the colon.

10.1 Establishing a bowel management routine or programme

The bowel routine or programme is a complex intervention comprised of a range of sometimes invasive interventions used on a regular predetermined frequency. While the gastrocolic reflex is strongest after breakfast, the time of day for bowel management is not otherwise significant; it should be fitted around the individual's other activities and routines, and be sustainable. The frequency with which the programme is conducted will vary depending on the needs of the individual; those with areflexic bowel function may manage their bowel daily or twice daily (sometimes more) while individuals with reflex bowel function may evacuate their bowel on a daily or alternate day routine (Coggrave et al 2008). Less frequent or irregular bowel management may contribute to constipation (Coggrave et al 2008). However, overly strict adherence to a rigid bowel routine is associated with increased impact on quality of life (Coggrave et al 2008) and the capacity for flexibility should be maintained where possible. In infants with spina bifida implementing 'potty training' at the usual age will help to establish a routine.

10.2 Optimising diet and fluids

Many individuals with neurogenic bowel dysfunction report that they manipulate their diet (Coggrave et al 2008) to assist their bowel management even though there is no robust evidence to support any dietary intervention. Hence in this population it is generally advised that a diet containing five portions of fruit and vegetables and significant levels of whole grain foods, such as wholemeal bread or unrefined cereals, each day should be encouraged, in accordance with the government's '5 a day' strategy (Department of Health 2003 and 2012). Stool consistency can then be assessed and the diet adjusted accordingly to achieve an appropriate stool consistency. Individuals with reflex bowel function are encouraged to aim for a soft-formed stool consistency (Bristol Scale 4 – see glossary (Heaton et al 1992), while those with areflexic bowel function are more likely to avoid faecal incontinence if they aim for firmer stools (Bristol Scale 2-3 – see glossary (Heaton et al 1992). Digital removal of faeces is also facilitated by a firmer consistency.

With regard to fluid intake, it has been suggested that individuals with neurogenic bowel dysfunction require additional fluid compared to other people (Consortium for Spinal Cord Medicine 1998). However, there is no research evidence to support this, and fluid intake may be determined by specific bladder management approaches. The British Dietetic Association recommends between 1.5L and 2.5L of fluid daily for the general adult population, depending on level of activity and prevailing weather conditions (BDA 2006). Urine colour is correlated with the concentration of urine; urine of a 'pale straw colour' indicates adequate hydration (BDA 2007), and is a simple 'rule of thumb' which is useful to patients. However, there is no evidence that extra fluids reduce a tendency to constipation unless an individual is clinically dehydrated.

See appendix 1 for further information on managing diet

10.3 Gastrocolic reflex

The gastrocolic reflex is a reflexic response to the introduction of food and/or drink into the stomach, resulting in an increase in muscular activity throughout the gut (Harari 2004) which can result in movement of stool into the rectum ready for evacuation. While the evidence for this response in individuals with neurogenic bowel dysfunction is equivocal (Aaronson et al 1985, Glick et al 1984, Menardo et al 1987) it is still regarded as worthy of trial in assisting with management (Walter et al 2003, Harari et al 1997). The individual is advised to take some food and/or drink 15 - 30 minutes prior to commencing other bowel management activities. The reflex response is usually strongest after the first meal of the day but can be stimulated by eating and drinking at any time.

10.4 Abdominal massage

The use of abdominal massage has been reported by 22-30% of individuals with neurogenic bowel dysfunction (Coggrave et al 2008, Han 1998). Physiological studies have demonstrated that massage produces a measurable response in the rectum and anus (Coggrave et al 2007a). Regular use of abdominal massage has been found to reduce constipation in individuals with Multiple Sclerosis (McClurg et al 2011). Massage is applied to the abdomen following the usual lie of the colon in a clockwise direction. Using the back or heel of the hand or a tennis ball or similar, pressure is applied and released firmly but gently in a continuous progression around the abdomen. Lighter stroking movements may also be used, which may trigger somato-visceral reflexes. Massage may be used before and after digital rectal stimulation, insertion of stimulants or digital removal of faeces to aid evacuation (Coggrave 2005). A recent review of the evidence found that 'abdominal massage can relieve constipation of various physiological causes by stimulating peristalsis, decreasing colonic transit time and increasing the frequency of bowel movements. It reduces feelings of discomfort and pain, and induces a feeling of relaxation. It has also been found to improve patients' quality of life (Lamas et al 2011). However, evidence is still lacking in regard to mechanism of action, required duration for effectiveness, and which aetiologies respond to it.

10.5 Pharmacological rectal stimulation: suppositories, enemas

Rectal stimulants are used to trigger evacuation of the bowel at the appropriate time for the individual and are essential to achieving managed continence for many people with neurogenic bowel. Oral laxatives cannot replace the function of rectal stimulants. In individuals without full control over defaecation, use of oral laxatives without planned stimulated reflex evacuation, or other method of evacuation in areflexic bowel function, often results in faecal incontinence in individuals with neurogenic bowel dysfunction.

Suppositories of some kind are reported to be used by between 32-71% of individuals with neurogenic bowel dysfunction (Coggrave et al 2008, Kirk 1997, Correa and Rotter 2000). Preserved anorectal reflexes respond to pharmacological stimulation, which vary in the speed and effectiveness of the evacuation they produce (Amir et al 1998, House and Steins 1997, Frisbie 1997, Dunn and Galka 1994). It is a general principle to use the gentlest form of stimulation possible in order to achieve timely evacuation, holding more powerful stimulants in reserve for problem-solving (Ash 2005). However inadequate pharmacological stimulation can lead to the requirement for more digital stimulation, so both forms of stimulation should be considered together when deciding on the appropriate pharmacological stimulant for an individual.

Available rectal stimulants include:

- Glycerin suppositories act as a mild local stimulus and lubricant (BNF 2008) and usually produce a response in around 20 minutes
- Bisacodyl suppositories deliver a stimulant laxative to the rectal wall resulting in increased gut motility (BNF 2008). Bisacodyl suppositories with a polyethylene glycol base are reported to act more rapidly than those with a hydrogenated vegetable oil base (Frisbie 1997, House and Stiens 1997, Stiens 1997) but are currently not available on prescription in the United Kingdom; bisacodyl in a vegetable oil base produces a response in approximately 30 minutes
- Lecicarbon E is a carbon dioxide emitting suppository which stimulates contraction of the rectum within approximately 15 minutes
- Small volume enemas (microenemas), such as docusate enemas (Norgalax) have been reported to be safe and effective (Dunn and Galka 1994), and more effective than either glycerin or bisacodyl suppositories (Amir 1998). Sodium citrate and sorbitol microenemas (Micralax) are commonly used. Studies of efficacy of suppositories and enemas in this population are lacking. The principle of using the gentlest stimulant that is effective should be followed

- Large volume phosphate enemas are not used routinely as retention is not usually possible and autonomic dysreflexia may be triggered in susceptible individuals (Ash et al 2006, Steins et al 1997), onset of action may be unpredictable and they may cause watery stools and abdominal cramping. Over-distention of the colon or rectum, rectal trauma, and electrolyte imbalance have very rarely been reported in adults using phosphate enemas (Paran et al 1999, Davies 2004, Wiesel and Bell 2004). However, when faecal impaction occurs, phosphate enemas may be used to help resolve the impaction in conjunction with oral treatment; in some individuals where other rectal stimulants are no longer effective and other methods of management are inappropriate, ongoing use may be required. The reasons for ongoing use should be documented along with evidence of evaluation of other methods

Rectal stimulants alone are seldom sufficient to prompt complete reflex evacuation; most individuals also require digital stimulation or digital evacuation of stool (Coggrave et al 2008).

10.6 Digital rectal stimulation

Use of digital rectal stimulation is reported in 35–50% of individuals with neurogenic bowel dysfunction after SCI (Coggrave et al 2008, Correa and Rotter 2000, Han et al 1998, Mathews 1997). Digital rectal stimulation is a technique used to increase reflex muscular activity in the rectum thereby raising rectal pressure to aid in expelling stool, and to relax the external anal sphincter, thus reducing outlet resistance (Korsten et al 2007, Coggrave 2005, 2007a, 2008, Consortium for Spinal Cord Medicine 1998). It is used to stimulate the movement of stool into the rectum and to initiate defaecation at a chosen time and relies upon the presence of reflex bowel activity; it is only available in individuals with reflex bowel dysfunction. While some authors suggest it can replace the use of pharmacological rectal stimulants (Bedbrook 1991) others have reported that it may not be as effective in all individuals with reflex bowel function and is associated with longer duration of bowel management (Coggrave et al 2008).

Digital rectal stimulation is performed by inserting a gloved, lubricated finger gently through the anal canal into the rectum and slowly rotating the finger in a circular movement, maintaining contact with rectal mucosa (Consortium for Spinal Cord Medicine 1998, Weisel and Bell 2004) and gently stretching the anal canal. The stimulus is continued until relaxation of the external sphincter is felt, flatus or stool passed, or the internal sphincter contracts (a sign of colonic activity) and is seldom required for more than 15-20 seconds; longer than one minute is rarely necessary (Stiens 1997). The finger is then removed to allow reflex function to occur. The stimulation may be repeated every 5–10 minutes approximately until evacuation is complete. The number of times this intervention can be used within one bowel management episode is contentious. Between three and six episodes would be within the range often reported by individuals. However there is no evidence on which to base a recommendation and experience suggests that there is considerable variation between individuals as to what is required. Therefore the needs of the individual should be the prime consideration; digital rectal stimulation should be repeated until either reflex evacuation is complete and there is no more stool in the rectum or until it is evident that the reflex has ‘tired’ and is not effective in prompting reflex evacuation of stool present in the rectum. In this event digital removal of faeces should be employed to ensure that the rectum is empty to avoid faecal incontinence or discomfort. For this technique to function optimally the stool should be Bristol Scale 4 (bulky, soft-formed); looser stool and constipated stool both result in less effective responses. Digital rectal stimulation may be performed when sitting over a toilet, shower chair or commode, or when lying by a carer or by the patient. There is no evidence to suggest that stimulation in either position is more successful or harmful than the other, and practice should be individualised depending on response to interventions and an appropriate risk assessment.

See appendix 3 for digital rectal stimulation procedure

10.7 Digital removal of faeces

This intervention involves the insertion of a single, gloved, lubricated finger into the rectum to break up or remove stool (Kyle 2005). It was the most commonly used single intervention in a large survey, reported by 56% of respondents (Coggrave et al 2008), and is associated with shorter duration of bowel care and fewer episodes of faecal incontinence (Coggrave et al 2008, Haas 2005). Digital removal of faeces is recommended in the early acute phase after SCI to remove stool from the areflexic rectum to prevent over-distension

with consequent damage to later reflex rectal function (Consortium for Spinal Cord medicine 1998, Grundy and Swain 2002, Harrison 2000). It is also a necessary intervention for a majority of chronic spinal cord injured individuals, as part of a well structured bowel management programme (Coggrave et al 2007b). It has been identified as the method of choice for long-term bowel evacuation in individuals with areflexic bowel dysfunction (Steins et al 1997), and may be used for removal of stool prior to placing suppositories in individuals with reflex bowel or to complete evacuation where reflex activity alone is insufficient to empty the bowel.

See appendix 4 for digital removal of faeces procedure

10.8 Autonomic dysreflexia and digital interventions – in individuals with spinal cord injury at or above the sixth thoracic vertebra

See Section 6.9 for details regarding Autonomic Dysreflexia

Digital stimulation of the rectum and digital removal of faeces may be associated with autonomic dysreflexia in individuals with spinal cord injury at or above the sixth thoracic vertebra. Autonomic dysreflexia in response to bowel management is often associated with the presence of faecal impaction, constipation, haemorrhoids or fissures and is therefore not unavoidable. A review of the bowel management routine and evaluation of outcomes should be undertaken to identify the cause of the problem and the bowel management programme adapted to prevent further episodes.

10.9 Oral laxatives

The use of oral laxatives is reported in 60% of SCI individuals (Coggrave et al 2008); however, little research has been conducted to evaluate the efficacy of laxatives in neurogenic bowel management. Commonly used oral laxatives include:

- stimulants (e.g. senna, bisacodyl) - prompt increased bowel activity resulting in the movement of stool into the sigmoid colon and rectum. They should be taken only prior to planned evacuation of stool otherwise they may increase risk of faecal incontinence in individuals with impaired faecal continence
- softeners (e.g. dioctyl), bulkers (e.g. ispaghula husk) and osmotics (e.g. polyethylene glycol, lactulose) - aimed at modulating stool form (softeners, bulkers and osmotics), taken regularly to maintain a predictable consistency

Use of oral laxatives is associated with faecal incontinence; they are not essential for all individuals with neurogenic bowel dysfunction and should be used only when individualised assessment indicates that they may be beneficial. When oral laxatives are used, thought should be given to how the individual will manage the resulting bowel activity. For individuals who are dependent in bowel care planned evacuation is essential or faecal incontinence is inevitable.

10.10 Valsalva manoeuvre/straining

Valsalva manoeuvre or 'straining' involves forcibly attempting to exhale against a closed glottis (Weisel and Bell 2004). This technique results in a rise in intra abdominal pressures and therefore intra rectal pressure. A very short episode of straining at the beginning of bowel evacuation can be considered as part of the normal physiology of defaecation (Pocock and Richards 2006). Some individuals who lack control of the abdominal muscles are unable to perform this intervention. Some patients can strain to assist with evacuation; however straining as the main method of evacuation is associated with a high degree of incontinence, constipation and other difficulties with evacuation (Yim 2001) and should be discouraged. In addition, excessive straining can cause severe renal and cardiovascular complications, and may interfere with proper functioning of medical implanted devices such as baclofen pumps. Straining is implicated in the development of haemorrhoids and rectal prolapse. Therefore patients with areflexic bowel function need to be taught to use straining with caution, if at all (Coggrave 2005). In individuals with Parkinson's Disease straining can result in paradoxical sphincter contraction or 'anismus', and contributes to problems with stool expulsion and constipation (Sakakibara et al 2010) and is therefore counter productive. Similar problems may be seen in individuals with MS and cervical SCI.

10.11 Transanal irrigation

Transanal irrigation of the bowel can be defined as a process of facilitating evacuation of faeces from the rectum and descending colon by passing water into the bowel via the anus in a quantity sufficient to reach beyond the rectum. Two recent reviews (Christensen 2010, Emmanuel 2010) have suggested that in individuals with chronic neurogenic bowel dysfunction, irrigation outperforms more conservative methods reducing faecal incontinence and constipation, improving

quality of life. However there is currently a lack of evidence in the acute and rehabilitating neurogenic bowel population. Irrigation does not work for every individual with neurogenic bowel dysfunction and as yet robust criteria for suitability have not been identified. Long term use is not thought to impact on colonic function but use does decline over time; the reason for this is not clear (Faaborg et al 2010).

Transanal irrigation involves the introduction of water into the rectum using a pumped or gravity fed system via a rectal catheter with an integral balloon Peristeen© (Coloplast Ltd) or via a cone-shaped device Qufora© (MBH International A/S, Denmark).The rectal catheter with balloon allows the catheter to be self retaining; the catheter need not be held in place for the duration of instillation of the irrigant. The balloon helps to form a seal that aids retention of the irrigant. However, in some individuals inflation of the balloon can lead to reflex expulsion of the catheter. The cone option is less likely to provoke reflex activity but must be held in place while the irrigant is infused requiring adequate balance, strength and flexibility. The individual must be able to sit upright over a toilet or commode for bowel care to use irrigation; while the volume of irrigant used varies widely between individuals, 500mls is a suitable starting point for adults. Irrigation can be self administered or administered by an appropriately trained carer. Transanal irrigation may be considered for individuals who experience faecal incontinence, constipation, abdominal pain associated with evacuation, bloating or prolonged duration of bowel evacuation (Christensen et al 2006). Irrigation does not rely upon retention of the fluid for effectiveness. The frequency of irrigation and volume of fluid used are individually determined for each individual. The two systems mentioned above are currently available on Drug Tariff in the UK. Transanal irrigation has been found to reduce faecal incontinence, constipation and time spent on bowel management and to improve symptom-related quality of life. Irrigation is a safe intervention and has not been shown to provoke autonomic dysreflexia in susceptible individuals (Christensen et al 2006) though it is a potential risk. There is a small risk of bowel perforation which is estimated to occur in less than 1 per 100,000 irrigations; however, individuals may irrigate daily or on alternate days for many years and risk may be cumulative. This should be discussed with the patient in the context of the choices available to them. To minimise the risk, and to promote success with irrigation, individuals with neurogenic bowel dysfunction wishing to use irrigation should be assessed, taught, monitored and supported by healthcare practitioners with appropriate expertise (Norton 2007, Coggrave 2007b).

10.12 Antegrade Continence Enema (ACE)

The ACE is a continent catheterisable stoma formed surgically from the appendix or caecum, giving access to the colon for administration of enema or irrigation for bowel management. The ACE procedure may reduce the duration of bowel care and incidence of faecal incontinence (Teichman et al 1998 & 2003, Christensen et al 2000); autonomic dysreflexia was eradicated in one case study (Teichman 1998). While common in children with spina bifida, few ACEs have been reported in adults with neurogenic bowel dysfunction and the failure rate in some studies is high (Gerharz et al 1997). They are seldom seen in adults in clinical practice.

10.13 Nerve stimulation techniques

Sacral anterior root stimulator (SARS)

The SARS has been available for several decades and though usually implanted primarily for bladder management problems after spinal cord injury it has been reported to have a very beneficial effect on bowel management for many individuals (Binnie 1991, Creasey et al 2001, Kachourbos and Creasey 2004, Liu et al 2005) (46-49). The implanted electrodes are placed on the second, third and fourth sacral anterior nerve roots and high voltage, short-lived stimulation is applied several times daily to empty the bladder; the colon is stimulated simultaneously, resulting in increased colonic activity, reduced constipation and sometimes defaecation during stimulation (Chia 1996). Implantation remains rare; just 7 of more than 1330 respondents to a recent SCI bowel management postal questionnaire reported using a SARS for bowel management (Coggrave et al 2009).

Sacral nerve stimulation (SNS)

SNS uses lower amplitude, chronic stimulation applied continuously to the sacral plexus (Kenefick and Christiansen 2004). Intact sacral nerves are required, and SNS is not effective in individuals with complete spinal cord injury (Jarrett 2004). However, some success has been seen in patients with cauda equina lesions (Gstaltner 2008). This technique is available through specialist pelvic floor centres.

10.14 Colostomy

The formation of a colostomy has been seen until recently as a last resort when dealing with neurogenic bowel dysfunction, and even as a failure of rehabilitation services (Randell et al 2001). However, a number of studies have found that the formation of a stoma can greatly improve quality of life for some individuals (e.g. Coggrave et al 2012, Rosito et al 2002). Colostomy can result in a reduction in time spent on bowel management (Coggrave 2012, Stone et al 1990) and an increase in independence in bowel care (Coggrave 2012, Kelly 1999). Despite largely positive outcomes, stomas are not without complications. These include paralytic ileus and bowel obstruction post operatively, peri-stomal hernia, diversion colitis (inflammatory changes in the redundant section of bowel) and skin rashes around the stoma causing problems with collection devices.

The discharge of mucous from the remaining defunctioned bowel can also be problematic, necessitating the use of pads or regular digital removal of the mucous or even proctectomy for some individuals (Coggrave 2012, Kelly et al 1999, Branagan 2003). Stoma irrigation can be employed to give effective control over stoma function but is underutilised in both the neurogenic and non neurogenic colostomy populations. Around 2.4% of SCI individuals in the UK have a colostomy formed for bowel management problems (Coggrave et al 2008).

11. Bowel management in early acute-onset central neurological conditions

Spinal cord injury, cauda equina syndrome and acute stroke

Bowel function following acute injury to the spinal cord will be areflexic due to spinal shock (see glossary for further information on spinal shock). The standardised approach described below should be instigated within 24 hours of admission and continued until spinal shock recedes (in spinal cord injured individuals), rehabilitation is commencing and the process of assessment and development of an individualised programme can begin.

In the individual with cauda equina syndrome and conus injuries, the bowel may be areflexic immediately and in the long term, but mixed dysfunction is also possible. Assessment and development of an individualised programme should begin when the individual is recovered from any surgery and is commencing rehabilitation.

Aims

- To prevent impairment of bowel function due to colonic faecal impaction
- To promote development of an effective bowel management programme for the future
- To inform the patient of the need for bowel care and to obtain informed consent

Immediate management

- Explain to the patient what bowel management is and its importance; obtain informed consent
- Gain verbal consent for each intervention – if unable to do so (e.g. patient unconscious), perform procedure as long as it is in the best interest of the patient after discussion with the multidisciplinary team
- Ensure privacy for performing bowel management and maintain the individual's dignity at all times – this can be difficult when on bed rest – make sure curtains are closed properly, only relevant staff are behind curtains and restrict access during bowel management. Consider the practicality of moving the patient (on the bed) to a more private area for bowel care
- Nil enterally for at least first 48 hours if the individual is at risk of paralytic ileus due to spinal shock
- Check twice daily with stethoscope for return of bowel sounds which indicate cessation of paralytic ileus associated with spinal shock
- Daily digital rectal examination to assess for and identify any changes in anal tone, sacral sensation, presence of faeces in the rectum and cessation of spinal shock
- Daily digital removal of faeces from the rectum if present
- During spinal shock a prescribed glycerin suppository may be used to lubricate the stool prior to digital evacuation if constipated, or to aid in release of flatus
- Following cessation of spinal shock in an individual with unstable spinal cord injury who remains on bed rest, remove faeces from rectum prior to inserting prescribed mild rectal stimulant (glycerine suppository) to assist in removing faeces, in reflexic bowel function (spinal cord injury above T12). In individuals with areflexic bowel function suppositories or other rectal stimulants will not elicit a reflex response and should not be used for routine management
- Allow at least 20 minutes for the prescribed mild rectal stimulant to work – time bowel management to coincide with log rolling the patient for hygiene and skin checking at a regular time of day. Suppositories can be given whilst patient is flat on the bed and bowel emptying can be performed when rolled. This minimises disturbance and handling of the patient

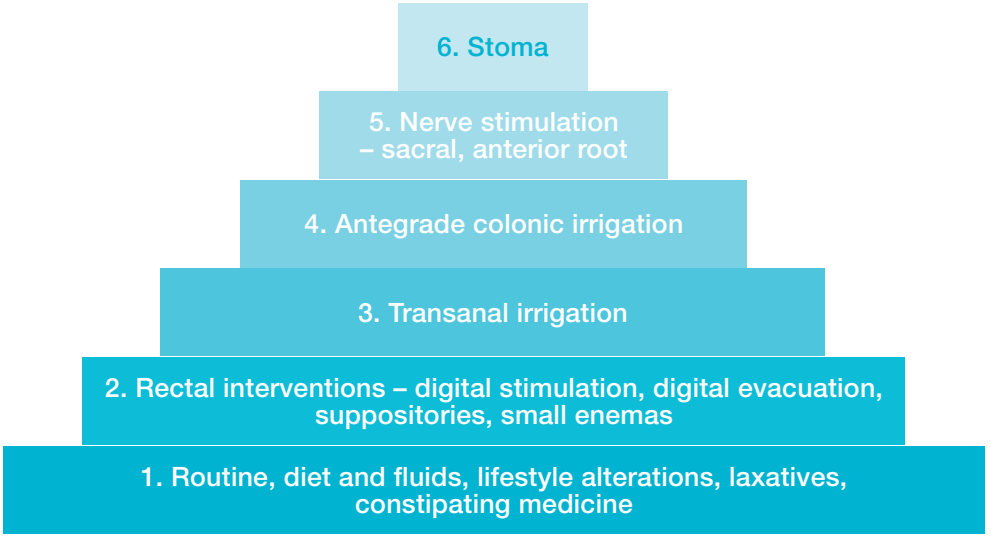
- Gastrocolic reflex and abdominal massage may promote evacuation, and oral laxatives may be required
- Bowel care should be conducted even if the rectum is empty on initial checking
- In patients with spinal cord injury, maintain spinal alignment at all times and ensure correct positioning when finished
- Check skin around peri-anal area – make sure skin is cleaned and dried adequately and use barrier creams if necessary, especially if stools are loose
- Record bowel management interventions used, duration of care and use the Bristol Scale (Heaton et al 1992) to describe the stool, record stool passage at times other than during bowel management as faecal incontinence
- Liaison with a rehabilitation team at this stage will help establish an appropriate bowel regime for the patient which can then be maintained through rehabilitation and beyond, minimising disruption
- Re-evaluation of the bowel programme should occur:
    - when spinal shock recedes so that assessment can lead to the development of an individualised bowel programme
    - when oral intake/diet changes
    - following changes in medication

12. How is an individualised bowel care programme developed?

Bowel management interventions are chosen following assessment of the individual's needs and evaluation will usually start with the most simple and least invasive options.

The pyramid below illustrates a generally accepted hierarchy of interventions. It reflects the level of complexity, invasiveness, risk and reversibility of the various interventions while acknowledging issues of cost and evidence of benefit. Conservative management encompasses levels 1 and 2; these are simple, low cost interventions which will meet the needs of a significant proportion of individuals at least in the short term. Individuals will usually but not necessarily work through these options before progressing if required to higher levels. Not all levels are appropriate to all individuals and the pyramid does not represent a strict pathway. Movement up or down the pyramid is guided by ongoing assessment and evaluation.

Choice of intervention does not depend solely on the specific bowel dysfunction but will also be determined by mobility, hand function, independence, carer availability, home setting and the personal preference of the individual. As the neurological condition of the individual changes, and as they age and possibly develop other health concerns, their needs regarding bowel management will change and the interventions they choose may change. Beyond conservative methods, not all interventions are supported at every centre where individuals may be treated. Appropriate onward referral to other specialist services when the needs of the individual can no longer be met in a particular setting is essential.



Hierarchy of interventions for neurogenic bowel management (after Christensen, 2006b)
NB Not all levels are appropriate to all individuals and the pyramid does not represent a strict pathway – movement up or down the pyramid is guided by ongoing assessment and evaluation.

12.1 Conservative management

Conservative management involves developing a routine which combines a number of the interventions described in Section 10. Example plans for combining selected interventions for conservative management of reflex and areflexic bowel dysfunction are given below.

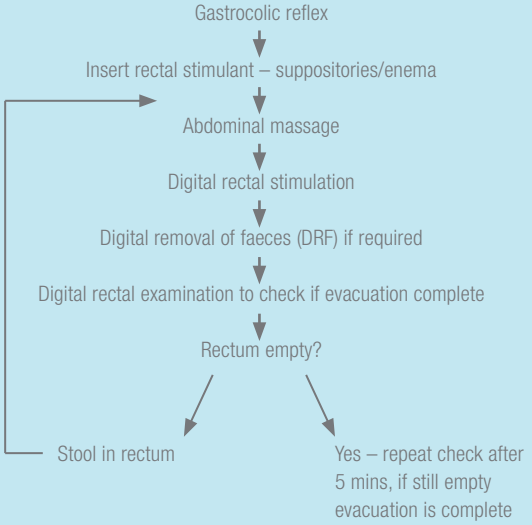
Conservative reflex bowel management

Bowel evacuation can be produced by the use of pharmacological rectal stimulants and digital rectal stimulation (Shafik et al 2000), or a combination of both (Coggrave et al 2009), but often must be followed by digital removal of faeces (DRF) to ensure complete evacuation (Coggrave et al 2009, Haas et al 2005). The optimal combination should be developed on an individual basis. Manipulating stool consistency through diet, fluids and, if necessary, medication to achieve Bristol Scale 4 produces the optimal stool for effective reflex bowel function. Establishing a regular pattern for bowel care helps to ensure that stool is present in the rectum and sigmoid colon ready for evacuation at the chosen time. This can be assisted if required by the use of stimulant laxatives as part of each discreet bowel management episode.

Outline plan for reflex bowel management programme

Daily or alternate day at a regular time
Attention to diet
Regular oral medications for stool consistency if required
Stool consistency Bristol Scale 4

Stimulant laxatives 8-12 hrs before planned bowel care if required
Hot drink and/or food 20-30 minutes before bowel care



Conservative areflexic management

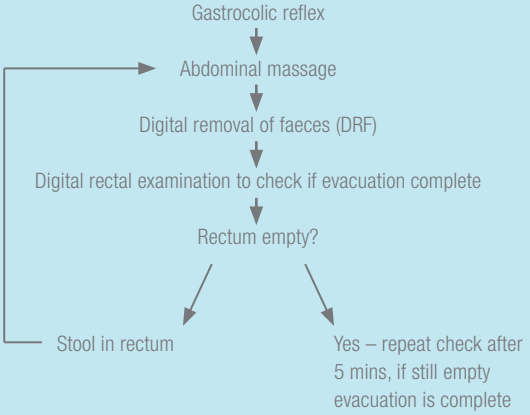
As there are no preserved anorectal reflexes, pharmacological or digital stimulation of the anorectum are not effective. Digital removal of faeces is the basic physical intervention used to achieve evacuation and therefore continence. Use of straining/Valsalva manoeuvre should be discouraged.

To facilitate digital removal of faeces, and to reduce the risk of 'stress' incontinence due to exercise or other physical exertion (e.g. transferring) resulting from the areflexic, relaxed anal sphincters, individuals are recommended to aim for a firm stool (Bristol Stool type 3) (Ash et al 2006, Consortium for Spinal Cord Medicine 1998).

Outline plan for areflexic bowel management programme

Daily or twice daily at a regular time
Attention to diet
Regular oral medications for stool consistency if required
Stool consistency Bristol Scale 2-3

Stimulant laxatives 8-12 hrs before planned bowel care if required
Hot drink and/or food 20-30 minutes before bowel care



12.2 Where should bowel management be conducted?

Bowel management may be performed on the bed or over a toilet or commode. The location should optimise safety, efficacy and acceptability for all parties involved, but with an emphasis on the individual's choice. Most individuals have an understandable preference for toilet use and the evidence suggests that for most patients, bowel management in the upright position is significantly quicker than when lying down (Coggrave 2007a), however the benefits need to be balanced against the hazards.

Assessing for independent use of the toilet for bowel care:

- Hand function: has the patient sufficient hand function to perform digital interventions? These require both a degree of motor power and some sensation in the fingers, which will exclude many individuals with impaired hand function i.e. individuals with complete SCI above C8. While some individuals may achieve reliable emptying after rectal stimulant insertion without the need for digital checking or further digital stimulation, many do require these additional interventions. There are devices available to insert suppositories/microenemas, and to assist with cleaning, but there is no aid available to help with digital checking/stimulating
- Ability to independently access the toilet: an individual may sit directly on the toilet or sit on a shower chair over the toilet. Use of a shower chair can reduce the need for transfers between the wheelchair/shower chair/toilet. However, shower chairs can be difficult to balance on for self care and while self management can be learnt using a shower chair, this will limit future lifestyle options if toilet use is not also learnt; while portable shower chairs are available, it can be difficult to take a shower chair with you everywhere you go and this then necessitates carrying out bowel care whilst in bed. Wherever possible the individual should be taught to transfer on and off the toilet itself. Falls from the toilet are fairly common and can cause significant injury (Nelson et al 2003, Vestergaard et al 1998)
- Availability of suitably adapted toilet facilities: wheelchair accessibility, handrails and a padded/contoured toilet seat. A home visit by an occupational therapist may be required
- Risk to skin integrity: all individuals with diminished/absent sensation and prolonged toileting should use a pressure-relieving seat whether using the toilet or a shower chair (Slater 2003). This will reduce the risk of pressure damage to the skin but not eliminate it. Individuals with a history of skin damage and resultant scarring may not tolerate even a short sitting time safely. Minimising duration of bowel care through an effective and timely bowel management programme is essential

Assessing for carer assisted/dependent bowel care:

- There are considerable moving and handling considerations here that extend beyond transfers (Ash et al 2006)
- Is use of a shower chair possible - use of a shower chair will minimise transfers and optimise carer access to the anal area. This can greatly reduce the moving and handling risks for care givers. Shower chairs are available with the opening to the side, front or back and can be selected to facilitate access to the anal area, depending on the individual's posture
- Does the physical environment and patient's size and shape allow easy and safe access for all interventions required by the individual: insertion of rectal stimulants, digital rectal stimulation, checking and cleaning (Ash et al 2006)
- Is a carer constantly available during the procedure? Can the individual safely be left alone for periods during bowel management?

General factors to consider:

- Patient/carer motivation
- Skin condition
- General health/frailty (i.e. postural hypotension, extreme old age)
- Degree of spasticity
- Balance
- Home circumstances: privacy and dignity, accessibility, availability of suitable equipment

13. What should be recorded about bowel management?

Good record keeping is integral to the provision of safe and effective care (NMC, 2010, p6). It facilitates continuity of care, identification of risks and problems at an early stage (RCN, 2008) and provides an accurate account of care planning and delivery.

Good record keeping is essential for development and evaluation of the bowel programme. During development and when the individual is an inpatient in any setting the details of the bowel programme and any changes to it should be clearly recorded in the healthcare record.

In the community, an independent individual is well advised to record the outcomes of bowel care when there is a problem; this will facilitate re-evaluation. Otherwise such recording is not necessary.

Where some or all of the bowel care programme is delivered by an NHS or agency care giver in the community, a record of the bowel programme should be available in the patient's home as well as in appropriate professional healthcare notes; this promotes continuity of care and identification of problems. The details of outcomes should be kept in the home for ease of access and review with the individual receiving care.

The following should be recorded in relation to the individual's bowel management programme:

- Frequency of bowel care e.g. daily/alternate days
- When: time of day that bowel care takes place
- Who provides the bowel care e.g. District Nurse, Carers
- Where: location where bowel care takes place e.g. in bed, over a toilet/commode
- Equipment required e.g. shower chair with aperture at the back
- Use of rectal stimulants (type, amount and timing in relation to bowel care episode)
- Interventions to be used and the order of their use (abdominal massage, digital rectal stimulation, digital evacuation, irrigation – fluid volume, rectal catheter balloon inflation if relevant)

The following objective outcome measures are essential for evaluation of the programme:

- Episodes of faecal incontinence: episodes per day and timing of these in relation to bowel care e.g. 3 hours after bowel care completed, after a meal. Stool type (Bristol Scale) and volume of incontinence
- Duration of bowel care episodes (from insertion of rectal stimulant, or instigation of fluid instillation for irrigation to completion of episode – not including clean-up time)
- Result – was stool evacuated?
- Stool form using the Bristol Scale
- Neurogenic Bowel Dysfunction Score (Krogh et al 2006)

Other relevant factors:

- Condition of anal area, presence of haemorrhoids, anal fissure, rectal bleeding etc
- Autonomic symptoms and Autonomic Dysreflexia episodes in relation to bowel care
- Abdominal symptoms – bloating, nausea, loss of appetite, pain
- Changes: to any part of the bowel management programme
- Referral: to Specialist/GP, date of referral and reason

14. What preparation does an individual need for managing their bowel dysfunction?

Individuals with long term neurological conditions may be physically independent in their bowel care and manage their own needs, or they may be dependent on a carer for assistance with some or all of their bowel management programme.

An individual who is physically dependent in bowel care should be supported to be verbally independent and take control of and responsibility for their bowel care. This means they should be able to instruct a carer in how to undertake their bowel management and to receive and act upon feedback received from the carer regarding the outcomes of management.

In either case the individual requires knowledge and understanding of:

1. The impact of their neurological condition on their bowel function
2. Theoretical knowledge of their bowel management interventions and influencing factors e.g. diet and fluids, regular routine etc
3. Practical skills for bowel management on bed and/or toilet, as appropriate
4. How and when to adjust the bowel regime
5. How to identify complications and what action to take
6. How to obtain supplies of disposable items required for bowel care in the community
7. How to access assistance from healthcare professionals if required e.g. contact details of specialist nurses providing support

15. Glossary of terms

Abdominal massage: Pressure is applied intermittently to the abdomen following the usual lie of the colon in a clockwise direction; using the back or heel of the hand or a tennis ball or similar, pressure is applied and released firmly but gently in a continuous progression around the abdomen. Lighter stroking movements may also be used, which may trigger somato-visceral reflexes. Massage may be used before and after digital rectal stimulation, insertion of stimulants or digital removal of faeces to aid evacuation (Coggrave 2005). Massage can also help to push stool out of an areflexic bowel or to move stool down ready for manual evacuation. **See Section 10.4**.

Anal Fissure: A tear or linear ulcer in the skin lining in the anal canal (NHS Clinical Knowledge Summaries (CKS) 2011, Gordon and Nivatvongs 2007). **See Section 6.8**.

Anal reflex/wink: Visible reflex contraction of the external anal sphincter in response to pinprick or touch. The presence of the anal reflex indicates a reflex or upper motor neuron (UMN) bowel dysfunction (Zejdlik, 1992, p 400).

Areflexic (flaccid) bowel: Bowel dysfunction produced by injury or damage to the spinal nerves (conus medullaris or cauda equina), at the bony level of the first lumbar vertebra (LI) and below, resulting in an areflexic bowel with a lax anal sphincter and pelvic floor. Injuries at this level damage the autonomic reflex arcs between the spinal cord and the colon and ano-rectum. The reflex activity of the sigmoid and ano-rectum are lost. The management of areflexic bowel is based on a digital evacuation of stool.

Autonomic dysreflexia/hyperreflexia: A syndrome unique to individuals with spinal cord injuries at the 6th thoracic vertebra and above. Autonomic dysreflexia is an abnormal sympathetic nervous system response to a noxious stimulus below the level of injury resulting in rapidly rising blood pressure; it is a medical emergency. **See Section 6.9**.

Bowel care: Activity undertaken to regularly evacuate stool from the rectum and sigmoid colon.

Bowel management: Regular, pre-emptive individually developed and prescribed series of interventions carried out by the patient/nurse/attendant/carer to prevent faecal incontinence and constipation, usually in individuals with neurogenic bowel dysfunction.

Bowel programme: A combination of interventions in a given order conducted to achieve the predictable evacuation of the bowel at a chosen time and frequency with the aim of promoting continence and avoiding constipation and other secondary complications of the neurogenic bowel (Bedbrook 1981; Han et al 1998; Stiens et al 1997; Zejdlik 1992).

Bristol Stool Form Scale: Evidence-based objective descriptors of stool consistency. **See Appendix 2**.

Bulboanal reflex: A reflex stimulated by squeezing the glans penis or clitoris. It results in a palpable and visible contraction of the anal sphincter (Zejdlik, 1992, p 400). A positive bulboanal reflex indicates that the reflex pathways between the bowel and sacral cord are intact. If present, it indicates reflex or upper motor neuron (UMN) bowel dysfunction.

Constipation: There is no universally agreed definition of constipation but it is associated with having infrequent bowel movements (usually suggested to be fewer than three per week), hard dry stools, sometimes small in size, which are difficult to eliminate i.e. Bristol Stool Form Scale type 1-2 (Heaton et al, NNDDIC 2011). **See Section 6.3**.

Constipation with overflow (overflow diarrhoea, spurious diarrhoea): When hard constipated stool accumulates in the colon looser stool from higher in the bowel leaks around the unmoving faecal mass, often associated with faecal soiling.

Where results from recent bowel management episodes have been constipated or absent and leakage of thin diarrhoea then occurs, overflow diarrhoea should be suspected. **See Section 6.4**.

Conus medullaris: The conical end of the spinal cord at the level of the lower end of the first lumbar vertebra.

Colonoscopy: An examination of the whole of the large bowel using a flexible endoscope. The NIHR Cancer Referral Guidelines 2006 make the following recommendations for referral for further investigation:

- In patients aged 40 years and older, reporting rectal bleeding with a change of bowel habit towards looser stools and/or increased stool frequency persisting for 6 weeks or more, an urgent referral should be made
- In patients aged 60 years and older, with rectal bleeding persisting for 6 weeks or more without a change in bowel habit and without anal symptoms, an urgent referral should be made
- In patients aged 60 years and older, with a change in bowel habit to looser stools and/or more frequent stools persisting for 6 weeks or more without rectal bleeding, an urgent referral should be made

Diarrhoea: Frequent (more than 3 times a day) passage of watery stool (Zedlick, 1992, p 413).

Digital rectal stimulation: The insertion of a gloved, lubricated finger through the anus into the rectum followed by a gentle circular motion of the finger for 20-30 seconds to stimulate reflex evacuation of stool. **See Section 10.6**.

Digital rectal examination: Examination of the rectum by inserting a gloved, lubricated finger into the rectum.

Digital removal of faeces/stool (manual evacuation): Removal of stool from the rectum using a gloved lubricated finger. **See Section 10.7**.

Faecal impaction: Faecal impaction is not well defined but 'copious formed stool in the colon (not just the rectum) which is not progressing through the colon or which cannot be expelled from the rectum are salient symptoms' (Coggrave 2010). **See Section 6.4**.

Flaccid bowel function (see Areflexic bowel): Lower motor neuron bowel resulting from damage to lower motor nerves leaving the spinal cord in the cauda equina. Sensation and voluntary control are impaired and autonomic reflex arcs between the spinal cord and sigmoid colonc/anorectum are interrupted. **See Section 5**.

Gastrocolic Reflex: A reflexic response to the introduction of food or drink into the stomach, resulting in an increase in muscular activity throughout the gut (28) which can result in movement of stool into the rectum ready for evacuation. It can be utilised by planning bowel evacuation 15-30 minutes after a meal – it is thought to be strongest in response to breakfast. **See Section 10.3**.

Haemorrhoids: Vascular swellings which may involve the internal or external venous plexuses of the anal canal (anal cushions) and may be associated with redundancy of the mucosa and/or perineal skin (skin tags).

Classification of haemorrhoids:
Grade 1 – bulge but maintain the position relative to the dentate line
Grade 2 – protrude past the dentate line on defaecation but return to normal position following defaecation
Grade 3 – require manual replacement back into position following defaecation
Grade 4 – protrude with any rise in intra-abdominal pressure and cannot be manually reduced. They have an increased likelihood of becoming thrombosed and excoriated and are prone to haemorrhage

Laxative (purgative, aperient): Medications intended primarily to increase movement of stool through the colon, by various methods.

Manual evacuation: Alternative term for 'digital removal of stool'.

Megacolon/megarectum: A condition of extreme dilation of the colon and/or rectum seen as dilated gas-filled loops on xray. Results in impaired colonic function. **See Section 6.6**.

Neurogenic bowel: 'Neurogenic bowel' is the term used to describe dysfunction of the colon (constipation, faecal incontinence and disordered defaecation) due to loss of normal sensory and motor control (2), as a result of central neurological disease or damage. **See section 5.2**

Osmotic laxative: These retain or pull fluid into the bowel making the stool wetter, thereby increasing bulk and softening stool i.e. lactulose, which should be taken regularly to maintain appropriate stool consistency.

Reflexic bowel: An upper motor neuron bowel produced by damage to the brain or spinal cord, resulting in impaired sensation and voluntary control and damage to upper motor neurons but leaving the autonomic reflex arcs between the cord and the sigmoid colon/ano-rectum intact. **See Section 5.2**.

Rectal stimulants: Pharmacological agents (suppositories or enemas) inserted into the rectum to stimulate reflex evacuation of stool. Not usually used in individuals with areflexic bowel function.

Rectocolic reflex: This is a pelvic nerve mediated pathway that produces propulsive colonic peristalsis in response to pharmacological (suppositories/enemas) or mechanical (digital) stimulation of the rectum and anal canal.

Spinal shock: The 'sudden and transient suppression of neural functions below the level of acute spinal cord lesions' (Nacimiento and Noth 1999). Spinal shock has a significant effect on autonomic nervous system activity; sympathetic activity below the level of a spinal cord lesion is suppressed (Zejdlik 1992, Sheerin 2005). The severity of spinal shock appears to be related mainly to the severity of the spinal cord lesion. The more profound the spinal shock, the slower it is to resolve, and resolution can also be delayed by post-injury complications (Atkinson and Atkinson 1996). Different types of reflex recover at different rates. The higher and more complete the spinal cord injury, the more severe the spinal shock, with neurologically complete tetraplegics suffering the most serious and wide ranging effects (Mathias and Frankel 1983).

The level and extent of the lesion is significant for two reasons. Firstly, complete lesions below the twelfth thoracic/first lumbar vertebrae will have permanent disruption of reflex function of the lower limbs, bladder, bowel and genitalia and will remain areflexic (flaccid). Secondly, patients with complete lesions above T6 will have more significant dysfunction of their sympathetic nervous system (Bravo et al 2004). Patients with neurologically incomplete lesions are generally less severely affected by spinal shock.

Immediately following the spinal cord injury all individuals will present with a loss of sensation, movement and reflex activity (spinal shock) below the level of injury. The rectum and anus will be areflexic and peristalsis will be absent resulting in a paralytic ileus. Without exception, all patients should be kept nil enterally for the first 48 hours post injury (Harrison et al 2008).

Even in the absence of bowel activity, bowel management must start on the day of admission with a digital check per rectum as part of the initial neurological examination. If faeces are present, gentle digital removal of faeces should be undertaken with ample lubrication. Caution should be used so as not to damage sensitive nerve and muscle fibres within the anal sphincter by too vigorous digital removal of faeces (DRF).

Stimulant laxatives: Directly stimulate peristalsis which pushes the stool along i.e. Senna, which is taken 8-12 hours prior to a planned evacuation.

Stool softener: i.e. Docusate sodium (Dioctyl) is a stool softener which has some stimulant effect. It enables the stool to retain more water and should be taken regularly to maintain appropriate stool consistency.

Unplanned bowel evacuation (bowel accident, faecal incontinence): When stool is passed outside of planned regular bowel care episodes. **See Section 6.2**.

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Appendix 1: Diet in neurogenic bowel management

1. Introduction

Along with other factors such as medication and exercise, food and fluid intake can strongly affect bowel activity. Faecal weight and consistency is affected by the amount and water-holding capacity of the remaining undigested material that passes into the colon, the amount of bacteria present and colonic transit times. There is a complex interaction in the way different food components affect all these factors. Good quality research in this area is lacking so much advice is based on clinical experience and best practice; an element of trial and error to determine what the individual finds effective is often required.

2. Aim of dietary assessment and alteration

To promote a diet that helps maintain appropriate stool consistency for bowel management whilst maintaining a balanced diet for health.

Objectives

- Identify dietary factors that may affect transit times and stool consistency
- Advise on changes to diet to alter stool as required
- Maintain a nutritionally complete dietary intake

3. Dietary factors that affect stool consistency

Dietary fibre is the main food component assessed in relation to bowel management. Dietary fibre is resistant to digestion in the small intestine and is therefore carried through to the large intestine encouraging transit and resulting in a wetter bulkier stool. The longer undigested waste remains in the colon the more water will be reabsorbed back into the body resulting in a harder stool. Food products that speed up colonic transit times result in less water being reabsorbed, leading to a softer stool.

Fibre can be grouped into two types, soluble and insoluble:

- **Insoluble fibre** bulks and softens stool, increasing faecal weight, and decreasing intestinal transit time in normal gut function, found in whole-grains such as wheat, maize and rice

- **Soluble fibre** is associated more with lowering blood cholesterol and blood glucose levels, found in oats, fruit and vegetables; however insoluble fibre is also found in these foods in varying proportions. In view of the associated health benefits, current guidelines are for 5 portions of fruit and vegetables daily

There is conflicting evidence regarding the effects of fibre in neurogenic bowel dysfunction.
In the non-spinal cord injured population insoluble fibre has been shown to speed up colonic transit times when combined with a good fluid intake. In a much quoted paper, Cameron et al (1996) showed this type of fibre slowing down colonic transit times in spinal cord injured individuals. However as the subjects in this study were given a very high fibre diet with added ground bran and little information was provided regarding fluid intake during the study, the findings are not very relevant to clinical practice.

However, as insoluble fibre has the greater water-holding capacity, initially adjusting the intake of this to alter stool form would seem appropriate. Keeping soluble fibre intake within current healthy eating recommendations, i.e. five portions a day, should be initially encouraged. Maintaining this soluble fibre intake, if tolerated, can help provide benefits to cholesterol and blood glucose levels. However, the quantity of fibre taken may need to be adjusted down depending on stool form and tolerance. Foods containing soluble fibre are also associated with foods containing vitamins and minerals that have many other health benefits.

Fat - Research in the non-neurogenic population suggests that a high fat diet can delay gastric emptying and slow colonic transit times. This could result in increased water re-absorption in the colon resulting in a drier stool. Diets high in dietary fat are often associated with diets low in dietary fibre, making it difficult to separate the specific effects of dietary fibre and fat. High fat diets also have a high calorific content which may result in unwanted weight gain.

Diuretic and Stimulant foods/fluids
There are some foods and fluids that can over-stimulate bowel activity or draw excessive fluid into the colon resulting in very watery stools. These include large quantities of:
Alcohol
Caffeine e.g. tea, coffee, cola, chocolate
Prunes and figs
Pure fruit juice
Sorbitol containing foods. (Sorbitol is a synthetic sweetener)

4. Probiotics
There is some evidence in the non-neurogenic bowel population that the use of probiotics can relieve symptoms of antibiotic induced diarrhoea when used during the course of antibiotics and may help to restore colonic flora after antibiotic treatment. Less rigorous studies have shown some benefit in non-specific causes of diarrhoea.

When taking probiotics it is important to make sure that they are not taken with hot food and drinks. This can deactivate the bacteria present reducing their benefit. If trying probiotics then they need to be taken daily for at least 4 weeks. If there is then no improvement in symptoms then they are unlikely to be of any benefit.

Patients with altered immune responses should be cautious about taking products containing live bacteria.

5. Enteral tube feeding
Anecdotal experience among dieticians working in the spinal injuries centres has suggested that it is preferable to start with a feed that does not contain fibre, especially in a newly injured patient. The quantity of fibre can then be increased as tolerated along similar lines to those who are taking oral diet.

Development of enteral feeding products has shown that the use of feeds containing a mixture of insoluble and soluble fibre, can help in controlling both constipation and diarrhoea; they must be introduced with caution and close monitoring as they may cause abdominal distension. It is therefore prudent to start with a feed that does not contain any fibre. Once this is tolerated at the prescribed feeding rate, it may be appropriate to gradually introduce a fibre-containing feed if it is necessary to help control bowel management, in discussion with a dietitian. There is anecdotal experience that always administering a fibre-containing feed may provide too much fibre for the patient to tolerate. Therefore, a mixture of different feeds should be administered. It is essential to maintain an adequate fluid intake with sufficient water flushes, as recommended by the dietician.

6. Manipulating diet to alter stool consistency
The flow diagrams that follow illustrate how to adjust dietary intake to alter stool consistency. Changes are best made in the order suggested. Before making dietary changes it is important to assess current fibre and fluid intake. An assessment tool can be found later in this section. It is important to make only one change at a time and to continue with that change for at least 1 week, unless major problems arise, before making further changes. Also be aware of any pre-injury diet and bowel related problems for example irritable bowel syndrome and food intolerances.

6.1 Stools too soft
Assess dietary fibre and fluid intake - using the tool provided in this section – **9.11 Fibre intake calculation**.

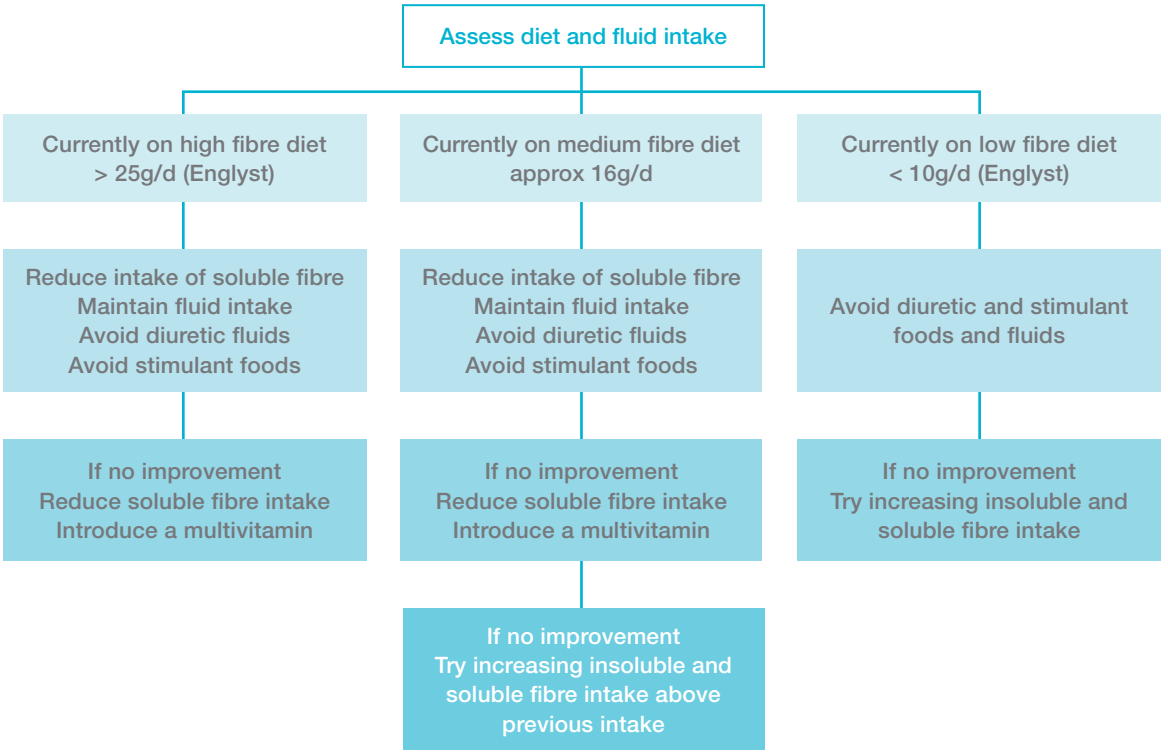
If current fibre intake is high (>25g/d) or medium (approx 18g/d) this should be reduced by initially reducing the insoluble fibre.

Soluble fibre intake should initially be maintained to ensure the recommendations of 5 portions of fruit and vegetables per day are met.

Adequate fluid intake remains important for hydration. High levels of diuretic and stimulant food and fluids should be avoided.

If reducing the insoluble fibre has shown no benefit, then reduce the soluble fibre intake. In this case a multivitamin and mineral supplement would also be used to replace those normally obtained through the fruit and vegetable intake.

Chart 1. Stools too soft



Englyst is the method of calculating fibre content used in the UK. This gives a figure about 30% lower than the AOAC method, which is used by the USA and the rest of Europe.

If the initial insoluble fibre intake was minimal or reduction of fibre has not been of benefit then steps should be made to increase the levels. This should be done gradually with an adequate fluid intake.

If all these changes make no difference return to normal diet, encourage as balanced a diet as possible. Consider soluble fibre supplements, which have been shown to reduce incontinence in community-dwelling adults with faecal incontinence (Bliss et al 2001).

When to consider anti-diarrhoeal medication
Consider anti-diarrhoeals such as loperamide which can be titrated to provide a firmer stool where non-neurogenic bowel causes have been excluded and dietary and other apparoaches have failed to successfully control stool form.

When does diarrhoea need investigating?
Refer urgently if red flag symptoms or signs are present (NHS Evidence Clinical Knowledge Summaries 2011).

- In particular, refer people who meet the following criteria, under 2-week wait rules for suspected colorectal cancer:
  - Symptoms suggestive of colorectal or anal cancer.
  - Aged 40 years or older, reporting rectal bleeding with a change of bowel habit towards looser stools and/or increased stool frequency persisting for 6 weeks or more.
  - Presenting with a right lower abdominal mass consistent with involvement of the large bowel.
  - Presenting with a palpable rectal mass (intraluminal and not pelvic).
  - Aged 60 years or older, with a change in bowel habit to looser stools and/or more frequent stools persisting for 6 weeks or more with or without rectal bleeding.
  - Men of any age with unexplained iron deficiency anaemia and a haemoglobin level of 11 g/100 mL or less.
  - Non-menstruating women with unexplained iron deficiency anaemia and a haemoglobin level of 10 g/100 mL or less.
  - For further information, see the CKS topic on GI (lower) cancer - suspected.

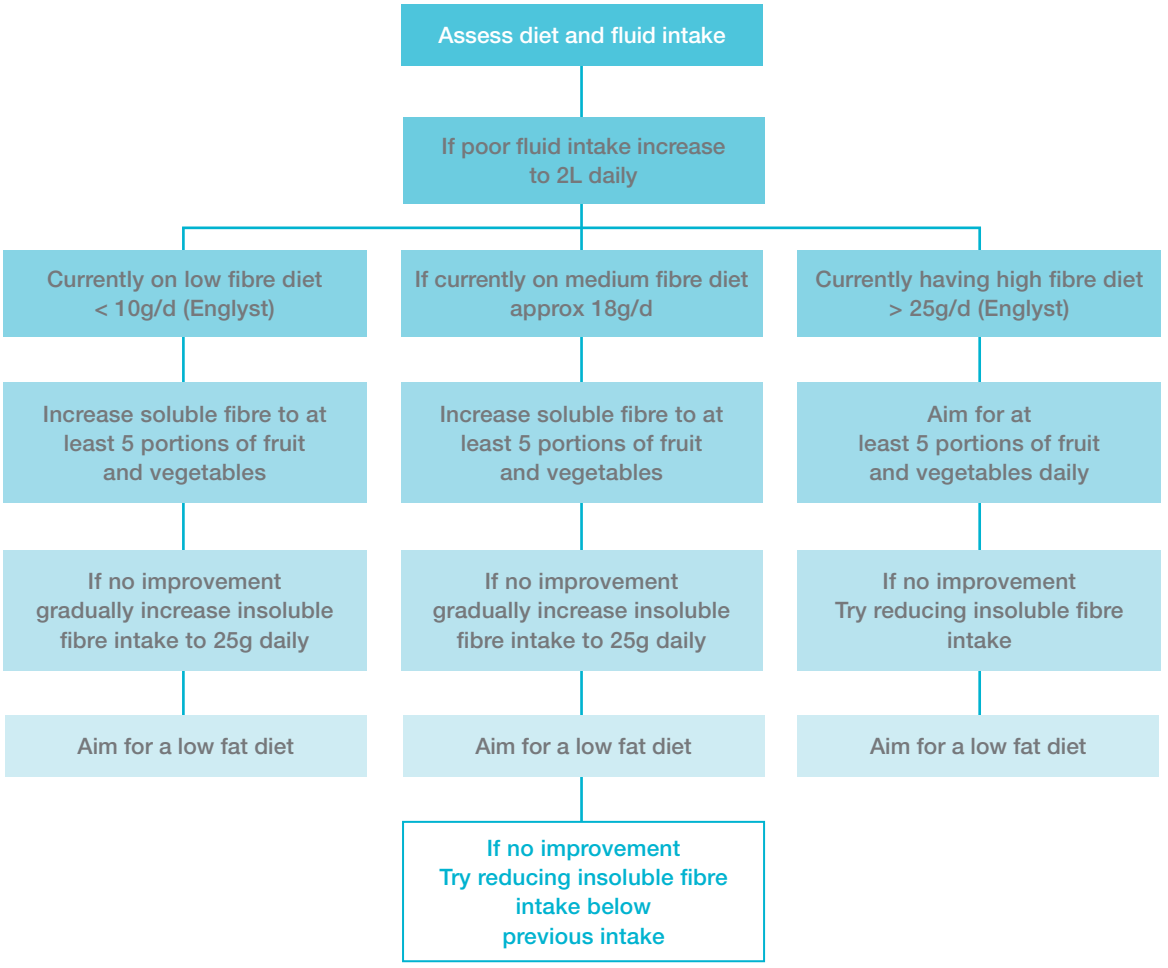
Refer people for further assessment and management if:

- History, examination, and blood test results suggest any of the following:
  - Coeliac disease (see the CKS topic on Coeliac disease).
  - Crohn's disease (see the CKS topic on Crohn's disease).
  - Ulcerative colitis (see the CKS topic on Ulcerative colitis).
  - The diagnosis is uncertain.
  - If the person is 45 years of age or younger, refer for flexible sigmoidoscopy (the diagnostic yield is not different to colonoscopy in this group).
  - If the person is older than 45 years, refer for colonoscopy.

6.2 Stools too hard

- Assess diet for current food and fluid intake – using assessment provided later in this section – **9.11 Fibre intake calculation**.
- Increase fluid intake with water-based fluids such as water, dilute squash, tea, coffee if intake inadequate.
- Encourage at least 5 portions of fruit and vegetables daily.
- If insoluble fibre intake is poor (<10g/d) or medium (approx 18g/d) then a gradual increase should be encouraged along with an adequate fluid intake. Usually not beyond 25g of total fibre.
- If fibre intake is high (>25g/d) or increasing the insoluble intake has not been beneficial, try reducing the insoluble fibre content gradually.
- If all these changes make no difference return to normal diet, encourage as balanced a diet as possible.
- Consider using a stool softener.

Chart 2. Stools too hard



Englyst is the method of calculating fibre content used in the UK. This gives a figure about 30% lower than the AOAC method, which is used by the USA and the rest of Europe.

When should constipation be investigated?
Referral is indicated when (NHS Evidence Clinical Knowledge Summaries 2011).

- Cancer is suspected.
  - o Referral for colonoscopy should be considered in people over 50 years of age if 'red flags' are present.
- An underlying cause is suspected.
  - o If an underlying problem is suspected, consider having the results from blood tests for inflammatory markers, hypothyroidism, hypercalcaemia, and coeliac disease available before the person attends their appointment.
- Pain and bleeding on defecation (e.g. from an anal fissure) is severe or does not respond to treatment for constipation.
  - o Consider surgical referral.
- Treatment is unsuccessful.
  - o Treatment failure may be early, when attempts at relieving faecal loading fail, or late, if there is difficulty maintaining remission.
  - o Management may require further tests (such as blood tests, radiological imaging for bowel studies, or consideration of rectal suction biopsy, or transit studies).
  - o Assessment is required prior to referral for other interventions (such as psychology, psychiatry).
- Faecal incontinence is present.
  - o Referral to Continence Service (if available) may be appropriate for advice and monitoring.
- More detailed support with diet is required.
  - o Consider dietetics referral.

7. Fibre intake calculation

The following chart and information regarding the fibre content of foods may be given to individuals to assess their own fibre intake.

'How Much Fibre Am I Taking?'
Changing your dietary fibre intake may help resolve constipation or loose stools and reduce the need for laxatives and other bowel medication.

Write down below what you ate yesterday (add in or remove foods if yesterday was not a typical day's intake).

Using the table on the following page work out approximately how much fibre you had.

To achieve a high fibre intake, increase your fibre intake **slowly** to 12 to 15 food portions containing 2 gms of fibre each (24-30g) per day.

If you need to reduce your fibre intake then start with the insoluble fibre foods e.g. instead of wholemeal bread take white bread.

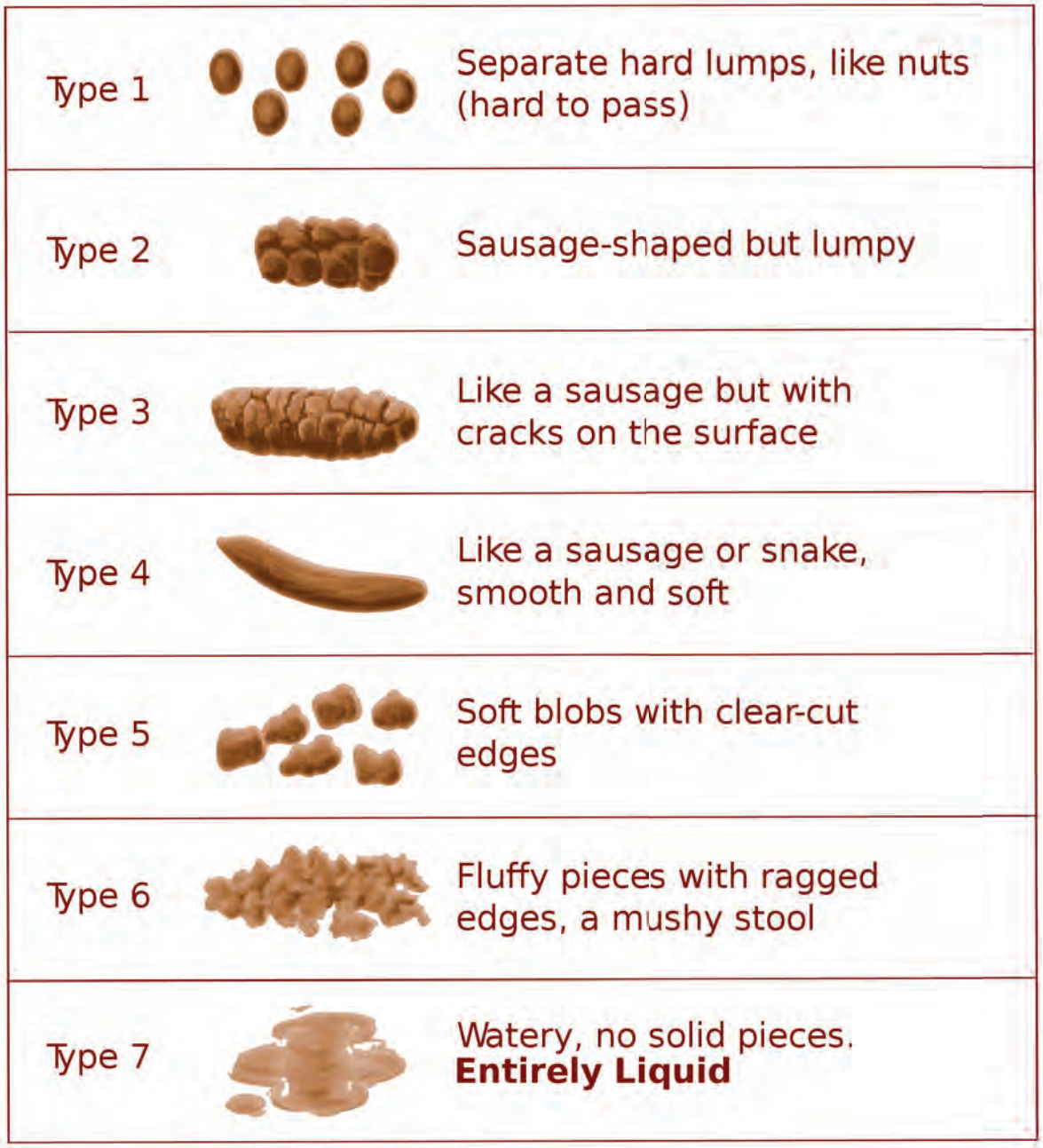
Remember you should also drink plenty of fluid to help the fibre work. Check you are having at least 10 cups of fluids (not including alcohol) per day. This is 2 litres or about 3 ½ pints. Keep a record for a day if you are not sure.

Name of Patient:		Date:
Meal	**Food Intake**	**Fibre intake**
Breakfast		
Mid morning		
Lunch		
Mid afternoon		
Evening		
During evening/ supper		
	Total fibre intake	

Food	Type	Portion required
Bread:	Wholemeal Brown Soft Grain White Wholemeal roll White Roll	1 small slice 1½ slice 1½ slice 2 small slices ½ roll 2 rolls
Breakfast Cereals:	All Bran Branflakes or Museli Cornflakes Porridge Shredded Wheat	1 tablespoon 2 tablespoons 8 tablespoons 1 ladle 1 biscuit
Rice and Pasta:	Brown Rice White Rice Wholemeal Pasta White Pasta	3 tablespoons (cooked) 5 tablespoons (cooked) 2 tablespoons (cooked) 4 tablespoons (cooked)
Miscellaneous:	Wholemeal Scone Plain Scone	1 small 2 small
Soluble Fibre		
Vegetables:	Cabbage, Cauliflower Carrots, Broccoli, Green Beans Parsnip, Turnip Spinach Sweetcorn Potato & Skin Potato without Skin	Large serving (4oz/110g) Med serving (3oz/85g) Small serving (1oz/28g) 2 tablespoons 1 medium (3oz/85g) 3 medium (9oz/250g)
Fresh Fruit:	Apple, Orange, Pear, Peach Banana Grapes Melon Raspberries Strawberries	1 medium 1 small 4oz/110g ½ melon 1oz/28g 6 (3oz/85g)
Dried Fruit:	Apricots Prunes Raisins, Sultanas	4 4 1 tablespoon
Pulses:	Butter, Baked, or Kidney Beans Lentils Peas	1 tablespoon 2 tablespoons (cooked) 3 tablespoons
Nuts:	Peanuts Peanut Butter	1oz/28g 2 tablespoons
Miscellaneous:	Fruit Cake	2oz/57g (small slice)

Appendix 2: Bristol Stool Form Scale

Bristol Stool Chart



The Bristol Stool Scale (Heaton et al 1992)

Appendix 3: Procedure for digital rectal stimulation

- Explain the procedure to the individual (if necessary) and obtain consent. Even if the individual consents to the procedure, if they request you to stop at any time, you must do so. The individual should be invited to have an escort present if they wish.
- Ensure a private environment.
- Observe the individual throughout the procedure for signs of autonomic dysreflexia (see Section 10 – Glossary) or other adverse events (Addison and Smith 2000).
- If not contraindicated (i.e. in unstable spinal cord injuries) position the individual in a lateral position (usually left side) with knees flexed. Flexing the knees promotes the stability of the individual and helps to expose the anus (Campbell 1993). If the spinal injury is unstable bowel management will be conducted during a team log roll, maintaining spinal alignment at all times. This procedure may also be conducted over the toilet/commode by the individual or the carer where no unstable spinal fracture is present.
- Place protective pad under the patient if appropriate.
- Wash hands, put on two pairs of disposable gloves and an apron.
- If the individual suffers local discomfort or symptoms of autonomic dysreflexia during this procedure, local anaesthetic gel may be instilled into the rectum prior to the procedure (Furasawa 2008, Cosman 2005). This requires 5-10 minutes to take effect and lasts up to 90 minutes. Note that long term use should be avoided due to systemic effects (BNF 2008).
- Lubricate gloved finger with water soluble gel.
- Inform individual you are about to begin.
- Insert single gloved, lubricated finger (Addison and Smith 2000) slowly and gently into rectum.
- Turn the finger so that the padded inferior surface is in contact with the bowel wall.
- Rotate the finger in a clockwise direction for at least 10 seconds, maintaining contact with the bowel wall throughout.
- Withdraw the finger and await reflex evacuation.
- Repeat every 5-10 minutes until rectum is empty or reflex activity ceases.
- Remove soiled glove and replace, re-lubricating as necessary between insertions.
- If no reflex activity occurs during the procedure, do not repeat it more than 3 times. Use digital removal of faeces (DRF) if stool is present in the rectum.
- During the procedure the person delivering care may carry out abdominal massage.
- Once the rectum is empty on examination, conduct a final digital check of the rectum after 5 minutes to ensure that evacuation is complete.
- Place faecal matter in an appropriate receptacle as it is removed, and dispose of it and any other waste in a suitable clinical waste bag.
- When the procedure is completed wash and dry the patient's buttocks and anal area and position comfortably before leaving.
- Remove gloves and apron and wash hands.
- Record outcomes using the Bristol Scale (Norgine 1999, Heaton 1993).
- Record and report abnormalities.

Appendix 4: Procedure for digital removal of faeces (on the bed)

- Explain the procedure to the individual (if necessary) and obtain consent. Even if the individual consents to the procedure, if they request you to stop at any time, you must do so. The individual should be invited to have an escort present if they wish.
- Observe the individual throughout the procedure for signs of autonomic dysreflexia or other adverse events (RCN 2000).
- Ensure a private environment.
- If the individual's spinal injury is stable, position the individual in a lateral position (usually left side) with knees flexed. Flexing the knees promotes the stability of the individual and helps to expose the anus (Campbell 1993). If the spinal injury is unstable, bowel management will be conducted during a team roll, maintaining spinal alignment at all times.
- Place protective pad under the individual.
- Wash hands, put on disposable gloves and apron.
- If the individual suffers local discomfort or autonomic dysreflexia during this procedure, local anaesthetic gel may be applied prior to the procedure (Furusawa 2008, Cosman 2005). This requires 5-10 minutes to take effect and lasts up to 90 minutes. Note that long term use should be avoided due to systemic effects (BNF 2008).
- Lubricate gloved finger with water soluble gel.
- Inform individual you are about to begin.
- Insert single gloved, lubricated finger (Addison and Smith 2000) slowly and gently into rectum.
- If stool is a solid mass, push finger into centre, split it and remove small sections until none remain. If stool is in small separate hard lumps remove a lump at a time. Great care should be taken to remove stool in such a way as to avoid damage to the rectal mucosa and anal sphincters i.e. do not over-stretch the sphincters by using a hooked finger to remove large pieces of hard stool which may also graze the mucosa. Using a hooked finger can lead to scratching or scoring of the mucosa and should be avoided. Where stool is hard, impacted and difficult to remove other approaches should be employed in combination with digital removal of faeces. If the rectum is full of soft stool continuous gentle circling of the finger may be used to remove stool: this is still digital removal of faeces.
- During the procedure the person delivering care may carry out abdominal massage.
- Once the rectum is empty on examination, conduct a final digital check of the rectum after 5 minutes to ensure that evacuation is complete.
- Place faecal matter in an appropriate receptacle as it is removed, and dispose of it in a suitable clinical waste bag.
- When the procedure is completed wash and dry the individual's buttocks and anal area and position comfortably before leaving.
- Remove gloves and apron and wash hands.
- Record outcome using the Bristol Scale (Norgine 1999, Heaton 1993).
- Record and report abnormalities.

Appendix 5: Resources

Professional Organisations

Association for Continence Advice
www.aca.uk.com/

Multidisciplinary Association of Spinal Cord Injury Professionals (MASCIP)
www.mascip.co.uk/Home.aspx

Service User Organisations

Bladder and Bowel Foundation
www.bladderandbowelfoundation.org

Beating Bowel Cancer
www.beatingbowelcancer.org or
patients@beatingbowelcancer.org

Chest Heart and Stroke Scotland
www.chss.org.uk

Multiple Sclerosis Society
www.mssociety.org.uk/

Multiple Sclerosis Trust
www.mstrust.org.uk/

Parkinson's UK
www.parkinsons.org.uk/

Spinal Injuries Association
www.spinal.co.uk/

Stroke Association
www.stroke.org.uk/

Spinal Cord Injury Centres UK and Ireland

Belfast Spinal Cord Injuries Unit
Musgrave Park Hospital, Stockman's Lane,
Balmoral, Belfast BT9 7JB
028 9066 9501
www.belfasttrust.hscni.net
info@belfasttrust.hscni.net

The Duke of Cornwall Spinal Treatment Centre
Salisbury District Hospital, Odstock Road,
Salisbury SP2 8BJ
01722 429291
01722 336262 bleep 1170
www.spinalinjurycentre.org.uk

The International Spinal Injuries and Rehabilitation Centre
Royal Buckinghamshire Hospital, Buckingham Road, Aylesbury, Buckinghamshire HP19 3AB
(private healthcare facility)
01296 678800
www.royalbucks.co.uk/

Golden Jubilee Spinal Injuries Centre
James Cook University Hospital, Marton Road,
Middlesbrough TS4 3BW
Reception 01642 283644
Acute Ward 01642 282641
Rehabilitation Ward 01642 282645
www.southtees.nhs.uk/live/

The London Spinal Injuries Centre
Royal National Orthopaedic Hospital,
Brockley Hill, Stanmore HA7 4LP
020 8954 2300
www.rnoh.nhs.uk

The Midland Centre for Spinal Injuries
The Robert Jones & Agnes Hunt Orthopaedic Hospital, Oswestry, Shropshire SY10 7AG
Reception 01691 404655
Liaison staff – 01691 404109/404655
www.rjah.nhs.uk

National Rehabilitation Hospital
Rochestown Avenue, Dun Laoghaire,
Dublin, Ireland
00 353 2355214
00 353 2355000 bleep 8017
www.nrh.ie/

The National Spinal Injuries Centre,
Stoke Mandeville Hospital, Mandeville Road,
Aylesbury, Buckinghamshire HP21 8AL
Tel: 01296 315818
www.spinal.org.uk

Princess Royal Spinal Injuries and Neurorehabilitation Centre
Northern General Hospital, Osborne Building,
Herries Road, Sheffield S5 7AU
Reception 0114 2715644
Acute Ward 0114 2715608
Rehabilitation Ward 0114 2715636
www.sth.nhs.uk
(then search for Northern General Hospital)

Queen Elizabeth Spinal Injuries Centre
Southern General Hospital, 1345 Govan Road,
Glasgow G51 4TF
0141 201 2555
www.spinalunit.scot.nhs.uk
Email: spinalunit@sgh.scot.nhs.uk

Welsh Spinal Injuries and Neurological Rehabilitation Centre
Rookwood Hospital, Fairwater Road,
Llandaff, Cardiff CF5 2YN
Reception 029 2041 5415
Ward 5 – 029 2031 3833
www.cardiffandvale.wales.nhs.uk

The Regional Spinal Injuries Centre
Southport and Formby General Hospital,
Town Lane, Kew, Southport PR8 6NJ
01704 547471
www.southportandormskirk.nhs.uk/spinal.asp

Yorkshire Regional Spinal Centre
Pinderfields General Hospital, Aberford Road,
Wakefield WF1 4DG
Reception 01924 201688
Medical Secretary 01924 212273
Liaison staff 01924 212056
www.midyorks.nhs.uk

Notes

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Ostomy Care
Urology & Continence Care
Wound & Skin Care

Coloplast

Coloplast develops products and services that make life easier for people with very personal and private medical conditions. Working closely with the people who use our products, we create solutions that are sensitive to their special needs. We call this intimate healthcare. Our business includes ostomy care, urology and continence care and wound and skin care. We operate globally and employ more than 7,000 people.

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Guidelines for Management of Neurogenic Bowel Dysfunction in Individuals with Central Neurological Conditions

Initiated by the Multidisciplinary Association of Spinal Cord Injured Professionals

Endorsed by:

Supported by Coloplast

Table of Contents

1. Preface

Dear Colleague

Changes in bowel function and control have a considerable impact on the quality of life of individuals with central neurological conditions. Among individuals with spinal cord injury, for example, loss of bowel control is often seen as more significant than loss of ambulation. Managing this change in function has implications for independence and autonomy, community integration and long term health for the affected individual. It is therefore an important area of care and rehabilitation.

The purpose of these guidelines is to bring together the research evidence and current best practice to provide support for healthcare practitioners involved in the care of individuals with a range of central neurological conditions. While most research evidence around neurogenic bowel management is related to individuals with spinal cord injury, the principles identified can be applied to individuals with other conditions with appropriate assessment and evaluation; hence this document has been expanded to reflect the needs of a wider neurological patient population.

This document provides guidance, standards, protocols and information to support appropriate effective and individualised bowel management which respects the dignity of the individual, in all settings where people with central neurological conditions receive care.

I would like to acknowledge the invaluable support given by Coloplast Limited through an educational grant.

The guidelines will be reviewed again in 2 years – 2014. Feedback and comment on this current version is very welcome.

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September 2012

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Angela Wickes and Jenny Whittall,
Active Assistance (Care Agency), 1 Suffolk Way, Sevenoaks, Kent, TN13 1YL

Marysia Wallace, Belfast Spinal Cord Injuries Unit, Musgrave Park Hospital, Belfast

2. Introduction/purpose

Damage to the central nervous system (brain and spinal cord) has a profound impact on the function of the large bowel and on the maintenance of faecal continence.

Stool transit through the bowel may be slowed placing the individual at high risk of constipation. Sensory and motor control of the ano-rectum may be impaired leaving the individual with reduced or absent voluntarily control of the process of defaecation. This combination of impaired continence and risk of severe constipation is termed neurogenic bowel dysfunction. Without intervention, the individual may be incontinent of faeces and chronically constipated, with all the reduced quality of life, social impacts and secondary complications that this implies. Problems with such a socially unacceptable and taboo area of bodily function often result in social isolation and impact on all aspects of life, including self concept and sexuality. The function of the large bowel must be actively managed to allow the individual some degree of continence and to minimise associated quality of life and health problems.

The purpose of these guidelines is to support the planning, implementation and evaluation of practical bowel management for individuals with central neurological conditions including:

- spinal cord injury (traumatic or non-traumatic including infection, inflammation, vascular events or malignancy; the term spinal cord injury (SCI) will be used throughout the document to represent spinal cord damage of any aetiology)
- multiple sclerosis (MS)
- spina bifida (SB)
- cauda equina syndrome (not strictly damage to the central nervous system but closely related symptoms)
- cerebral palsy (CP)
- stroke
- Parkinson's Disease (PD).

While the presentation of bowel dysfunction in these conditions may vary, the underlying cause is the same – damage to the nervous system control of the bowel. Most evidence for managing these problems is found in the literature around spinal cord injury. With appropriate assessment and evaluation, this knowledge can be applied to helping individuals with bowel dysfunction due to other central neurological conditions.

3. Quick guide to neurogenic bowel management

What neurogenic bowel function does the patient have?

Sensory function?

If sensation is present in the saddle area around the perineum, ano-rectal sensation is usually present. If sensation is present, digital interventions may be uncomfortable; rectal stimulants (suppositories, enemas) may cause less discomfort.

Motor function?

Reflex bowel function	Areflexic (flaccid) bowel function
Positive anal reflex (anal wink) – visible contraction of anus in response to pinprick of surrounding skin	No anal reflex (anal wink)
Positive bulbo-anal reflex – contraction of anus in response to pressure on glans penis/clitoris	Absent bulbo-anal reflex
Injury/damage to spinal cord/brain at or above twelfth thoracic vertebra, reflex or spastic paralysis	Injury/damage to conus or cauda equina, at or below first lumbar vertebra, flaccid paralysis

Outline bowel management programmes

Reflex bowel	Areflexic (flaccid) bowel
Daily or alternate days	**Once or more daily**
(Aim for Bristol Scale 4 stool) Stimulant laxative 8-12 hours before planned care if necessary ↓	(Aim for Bristol Scale 3 stool) Stimulant laxative 8-12 hours before planned care if necessary ↓
Gastrocolic reflex ↓	Gastrocolic reflex ↓
Rectal stimulant suppository/microenema ↓	Abdominal massage ↓
Abdominal massage ↓	Digital removal of faeces ↓
Digital rectal stimulation ↓	Single digital check to ensure rectum is empty 5-10 minutes after last stool passed
Digital removal of faeces if reflex evacuation incomplete ↓	
Single digital check to ensure rectum is empty 5-10 minutes after last stool passed	
Medications to adjust stool consistency (e.g. macrogols such as Movicol or Laxido, Lactulose, Fybogel or Dioctyl) should be taken regularly if needed	

4. Guideline summary

In acute onset neurogenic dysfunction (spinal cord injury, cauda equina or stroke) instigate a standardised bowel management plan within 24 hours of admission (see Section 11)

Non-acute – rehabilitation and ongoing management

- Assess the needs of the individual
- Plan bowel management in collaboration with the individual in the context of their goals and intended lifestyle, aiming to promote autonomy and independence
- Evaluate the bowel management programme using objective outcome measures and the subjective views of the individual
- Provide education for the patient and any carers
- Review the bowel programme regularly
- Provide information to empower and promote choice
- Refer on appropriately if the needs of an individual cannot be met in the current setting
- Refer on appropriately where bowel symptoms are not accounted for by neurogenic dysfunction

In the community or during admission to general hospital

- It is recommended as continuing best practice that NHS organisations providing acute care have a policy for manual evacuation of stool and ensure that suitably trained staff are available if the patient needs this (NRLS 2012)
- Failure to meet the needs of individuals for effective bowel management may be seen as neglect, under the definition of abuse in the NMC statement on 'Practitioner-Client Relationships and the Prevention of Abuse' (NMC 2002)
- An appropriate bowel management programme should be maintained during admission to non-specialist acute healthcare settings or in the community setting
- Many individuals with neurogenic bowel dysfunction are experts in their own care (NRLS 2012), and maintenance of an existing effective bowel management programme should be facilitated through access to suitable facilities and provision of any required assistance
- Where the current management is not effective, an alternative programme should be planned in collaboration with the patient to meet the needs identified in the assessment
- Where alteration of an existing programme is required, contact should be sought with the specialist care provider supporting the individual's health needs in relation to their central neurological condition – i.e. for an individual with SCI, their spinal cord injury centre

5. What is neurogenic bowel dysfunction?

A brief overview of normal structure, function and neurological control is followed by a description of neurogenic dysfunction

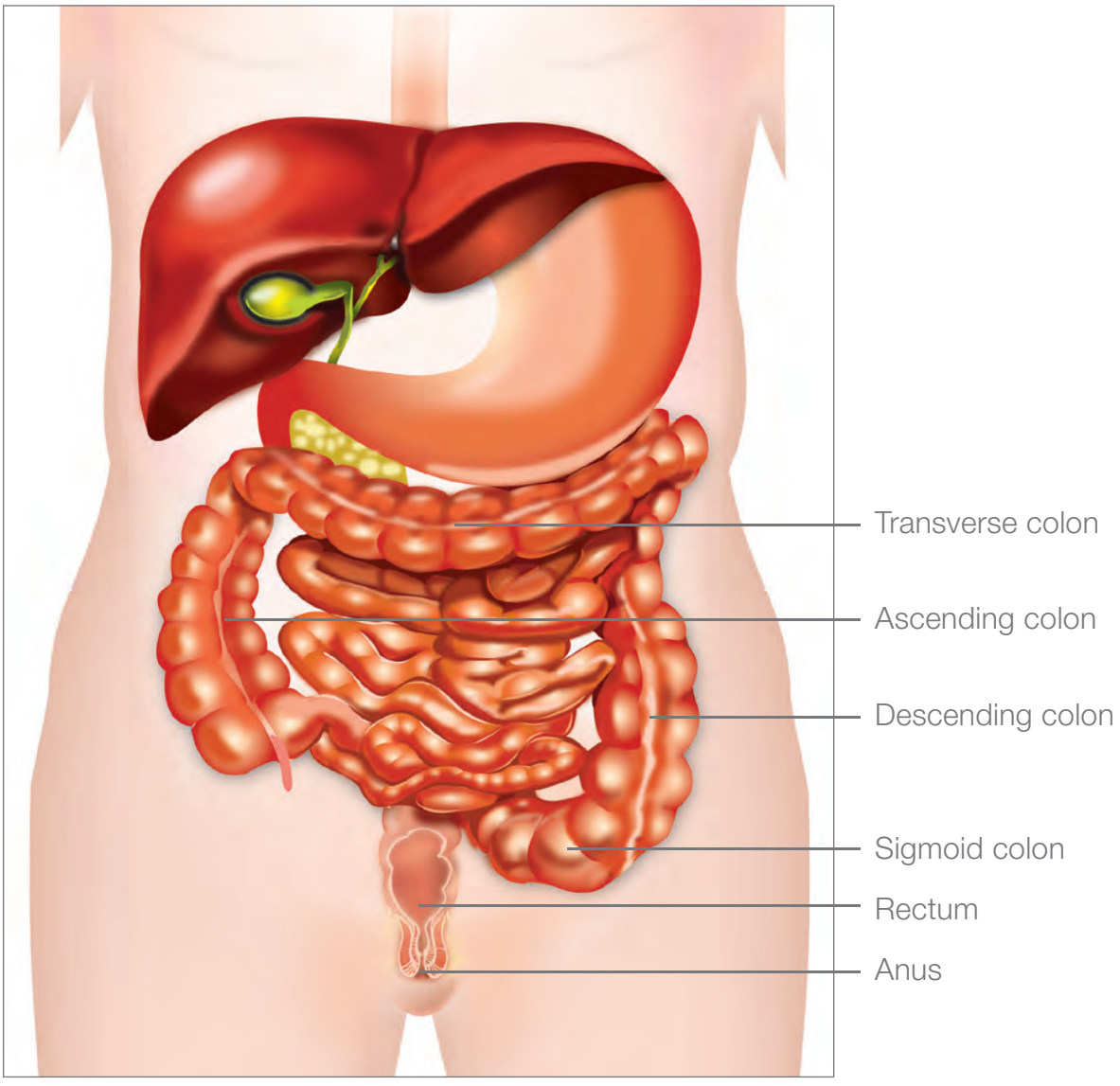


Figure 1: The digestive tract

5.1 Normal colon structure and function

- The large bowel comprises the final part of the digestive tract and is made up of three parts: the colon, the rectum and the anus (**Figure 1**)
  - The colon is a muscular tube around 1.5m long
  - The rectum is the name given to the last 20cm of the large bowel
  - The anus comprises the last 2-5cm of the rectum, composed of two distinct sphincters, internal and external. The internal anal sphincter, composed of smooth muscle (which has inherent tone), is under reflex control; even in the absence of normal external innervation the internal sphincter will have some tone and contractility. The external sphincter, composed of striated muscle (no inherent tone), is under both reflex and voluntary control via somatic lower motor neurones in the pudendal nerve from the sacral cord. In the absence of normal external innervation, the external sphincter will be areflexic

- The intrinsic or enteric nervous system is embedded within the gut wall, as the submucous (Meissner's) plexus and the mucosal (Auerbach's) plexus, and coordinates gut secretion, blood flow and muscular activity. The enteric nervous system gives the colon its inherent ability to produce peristalsis, a wave-like flow of contraction that pushes the stool, in stages, through the bowel towards the anus

- Extrinsic neurological input to the gut is via the autonomic nervous system:
  - Parasympathetic input to the ascending and near transverse colon comes from the vagus nerve, and to the remainder of the colon and anorectum via the sacral roots S2-4 through the pelvic nerves. Increases motility in the gut and relaxes sphincters
  - Sympathetic innervation comes from T6 – L2 nerve roots. Sympathetic activity results in decreased motility and tone in the colon and contracts the sphincters
  - These inputs influence the activity of the enteric system and are themselves modulated by centres in the spinal cord and brain (hypothalamus)

- The functions of the large bowel, or colon, are to:
  - complete the process of digestion through a process of fermentation involving commensal bacteria resident in the colon
  - to form, store and expel faeces from the body, involving absorption of water and minerals

- Stool is moved in and through the bowel by coordinated contractions of the muscle layers of the colon, called peristalsis. The innate rhythmicity within the smooth muscle fibres of the gut arises from the cells of Cajal which generate slow waves which continue in the absence of other neural input (e.g. after complete spinal cord transection)
  - The rhythms and size of these slow waves can be influenced by neuronal inputs and local hormones (Brading and Ramalingham 2006)
  - Almost constant mixing movements, called haustral churning, ensure the frequent presentation and representation of stool to the colonic mucosa thus facilitating absorption of water and minerals
  - Occasional 'mass movements' move the stool a long distance through the colon, always towards the anus. These mass movements occur rarely – two or three times a day, associated with the intake of food and stimulation of the gastro-colic reflex (Chung and Emmanuel 2006)

- Factors which are generally accepted as influencing colonic function in able-bodied people include diet, fluid intake, exercise and emotional and personality factors (Norton 1996, Totora and Agnastakoz 1990)

Defaecation

- A reflex activity under voluntary control
- A 'mass movement' delivers stool to the rectum, which is usually relatively empty, the rectal walls relax and filling occurs with little rise in pressure initially
- Eventually distension of the rectal wall triggers the recto-anal inhibitory reflex which relaxes the internal anal sphincter. The stool enters the upper anal canal and is sampled by the anal mucosa, allowing discrimination of gas, liquid or solid
- As filling of the rectum continues, nerve impulses are dispatched to the cerebral cortex resulting in conscious awareness of the need to defaecate
- The external sphincter initially contracts reflexly and, if evacuation of stool at that time is appropriate, the sphincter is then voluntarily relaxed; pressure in the sphincter is reduced. Concomitantly, voluntary contraction of the diaphragm and abdominal muscles raise intra-abdominal pressure and trigger peristalsis in the colon and rectum, the internal sphincter relaxes and when rectal pressure exceeds sphincter pressure, defaecation occurs (Brading and Ramalingham 2006)

- Powerful contractions of the rectum ensure evacuation of stool, maintained by sensory feedback from the anus until the rectum is empty (Emmanuel 2004, Tortora and Agnastakos 1990)
- If the external anal sphincter is not voluntarily relaxed defaecation will be postponed. This can be supplemented by a voluntary anal squeeze
- This complex process relies upon the existence of intact reflex arcs between the colon and spinal cord, and intact voluntary pathways between the ano-rectum and the hypothalamus

5.2 Definition of neurogenic bowel dysfunction

'Neurogenic bowel' is the term used to describe dysfunction of the colon (constipation, faecal incontinence and disordered defaecation) due to loss of normal sensory and/or motor control or both (Chung and Emmanuel 2006), as a result of central neurological disease or damage. Damage to the spinal cord and brain interrupts the neural pathways described above and the outcome will vary depending on the location and severity of the damage. Neurogenic function may be reflex, areflexic or mixed.

The spinal cord ceases at the bony level of the junction of the first and second lumbar vertebrae. The area directly below, the tip of the spinal cord, is called the conus medullaris. The nerves travelling within the spinal canal below the conus medullaris constitute the cauda equina.

- Reflex bowel dysfunction: results from damage to the brain or spinal cord above an undamaged conus medullaris - there is:
  - Loss or impairment of sensory perception of the need for defaecation
  - Loss or impairment of voluntary control of the external anal sphincter
  - Intact reflex arcs through the conus medullaris maintain tone (reflex activity) in the anorectum
  - Tone in the external anal sphincter, colonic wall and pelvic floor, is increased resulting in reduced colonic compliance, over-active segmental peristalsis, under-active propulsive peristalsis, spastic external anal sphincter constriction (Banwell et al 1993, Camallieri and Bharucha 1996, Stiens et al 1997). Modulation of colonic motor activity from the brain is lost and peristalsis and haustral movements continue though less effectively
  - Transit (the time taken for stool to pass through the colon) may be slowed throughout the colon (Krogh et al 2000, Leduc et al 1997, Nino-Murcia et al 1990)
  - Discoordination between relaxation of the anal canal and rectal contraction (recto-anal dyssynergia) can occur in individuals with lesions in the upper cord and brain (Nino-Murcia et al 1990) and is common in individuals with Parkinson's Disease
  - Outcome is constipation usually with faecal retention but reflex, uncontrolled evacuation of the rectum can occur. The remaining reflex activity in the anorectum can be utilised to aid bowel management
  - Damage in the thoracic and cervical spinal cord also reduces or eradicates the patient's ability to use the diaphragm and abdominal muscles to voluntarily increase abdominal and therefore rectal pressure

- Areflexic bowel dysfunction: damage to conus medullaris or cauda equina (at or below the first lumbar vertebra)
  - Loss or impairment of sensory perception of the need for defaecation
  - Loss or impairment of voluntary control of the external anal sphincter
  - Autonomic motor nerves are disrupted due to damage to parasympathetic cell bodies in the conus medullaris or their axons in the cauda equina
  - No spinal cord mediated peristalsis occurs and modulation of colonic motility by the brain is lost, resulting in a loss of effective stool transport in the descending and sigmoid colon and rectum (Banwell 1993)
  - External anal sphincter is denervated and flaccid
  - Pressure in the internal sphincter is reduced, pelvic floor muscles are areflexic allowing the sigmoid colon and rectum to descend into the pelvis, reducing the anorectal angle and opening the rectal lumen. The outcome is a high risk of faecal incontinence through the lax sphincter, as well as constipation (Steins et al 1997)
  - Colonic transit time through descending colon, sigmoid and rectum is considerably increased (Krogh et al 2000, Leduc et al 1997, Nino-Murcia et al 1990) contributing to constipation.

6. What are the clinical outcomes and complications of neurogenic bowel dysfunction?

6.1 Reduced quality of life

Delisa and Kirshblum (1997) suggest that 'establishing an effective bowel program is critical because incontinence may interfere with a patient's physical, psychological, social, recreational and sexual function' (page 388). This statement emphasises the all-pervasive influence of neurogenic bowel dysfunction on the life of the individual. If the affected individual is to maintain or return to an active role in the community – to work, study, to fulfil their role as parent or partner, to lead a full and socially engaged life – a bowel management program that is effective, timely and sustainable is essential. An effective programme requires considerable resources in terms of time, effort and self-discipline and possibly the input of a carer; for many individuals the fear of faecal incontinence is an added, ever present anxiety. The effects of neurogenic bowel dysfunction on the quality of life in this population are widely acknowledged and include loss of independence and social isolation (Emmanuel 2010, Byrne et al 1998, Correa and Rotter 2000, Glickman and Kamm 1996, Stiens et al 1997). It is not just actual faecal incontinence but fear of incontinence and the impact of managing the problem that impair quality of life. Neurogenic bowel dysfunction may lead individuals to curtail everyday activities outside the home or they may constantly 'scan' the environment when outside the home to ensure prompt location of public toilets (Collings and Norton 2004). Additionally, a neurogenic bowel is the source of considerable morbidity including haemorrhoids, abdominal pain, faecal impaction, rectal bleeding, rectal prolapse, anal fissure, bloating, nausea, autonomic dysreflexia and prolonged evacuation which all impair quality of life (Correa and Rotter 2000, De Looze at al 1998, Han et al 1998, Harrari et al 1997, Lynch et al 2001, Menter et al 1997). These problems can result in hospital admission for impaction, megacolon, constipation and volvulus more than twice as often as individuals without neurogenic bowel dysfunction (Sonnenberg et al, 1994).

6.2 Faecal Incontinence

Faecal incontinence is defined by the International Consultation on Incontinence as "the involuntary loss of flatus, liquid or solid stool that is a social or hygienic problem" (Norton et al 2009). Due to its social unacceptability, it is a deeply distressing problem, affecting between 1-10% of the general adult population (Perry et al 2002, Macmillan et al 2004, Whitehead et al 2009). It is far more common among individuals with central neurological conditions; 34-53% of individuals with spina bifida (McDonnell and McCann 2000, Verhoef 2005), 56% of individuals with cerebral palsy (Turk 1997), 30% of individuals following stroke (Harari 2003), 20-50% of individuals with MS (Hennessey 1999,Chia et al 1995, Hinds et al 1990) and 75% of individuals with spinal cord injury report faecal incontinence.
Contamination from stool may lead to an increase in urinary tract infections and cause damage to skin either directly or due to wearing pads. National Institute for Clinical Excellence (2005) highlights incontinence as a risk factor in the development of pressure ulcers.

6.3 Constipation

There is no universally agreed definition of constipation but it is associated with having infrequent bowel movements (usually suggested to be fewer than three per week), hard dry stools, sometimes small in size, which are difficult to eliminate i.e. Bristol Stool Form Scale type 1-2 (Heaton et al 1992). Constipation is associated with rectal and abdominal pain, painful defecation, difficulty with evacuation, straining at stool, bloating, prolonged evacuation, faecal incontinence and a sensation of incomplete evacuation. Constipation is common in neurogenic bowel dysfunction, reported by 40-54% of individuals with MS (Chia 1995, Hennesey et al 1999), 39-58% of individuals with SCI (Coggrave 2009, Han 1998, Kirk 1997) and 50% of individuals with Parkinson's Disease.

Constipation in this patient group is attributed to a slowing in gut transit due to interruption of nerve pathways compounded by disability-associated changes in mobility, spasticity, fatigue, concomitant use of multiple medications (polypharmacy) and inadequate fibre or fluid intake (Emmanuel 2010). In individuals with Parkinson's Disease, recto-anal dyssynergia is thought to contribute to constipation.

6.4 Faecal impaction

Faecal impaction is not well defined but 'copious formed stool in the colon (not just the rectum) which is not progressing through the colon or which cannot be expelled from the rectum are salient symptoms' (Coggrave and Emmanuel 2010). Impaction is common in this patient group and may rarely lead to stercoral ulceration and spontaneous bowel perforation (Banwell 1993). Symptoms may include absent or reduced evacuation of stool for a longer period than usual for the individual, abdominal bloating or distention, nausea and pain. Impaction may be accompanied by 'overflow' or 'spurious' diarrhoea where looser stool leaks around an unmoving faecal mass, often associated with faecal soiling. Impaction in individuals with compromised respiratory function as in high level SCI may result in breathlessness due to reduced diaphragmatic excursion. Stool will usually be Bristol Scale 1-2 but soft-impaction with putty-like stool may occur, associated with high fibre diet or bulking laxatives in immobile individuals (Coggrave and Emmanuel 2010). Susceptible individuals may demonstrate symptoms of sub-acute autonomic dysreflexia.

6.5 Haemorrhoids

An inflammation and swelling of veins in the anal cushions, a highly vascular area of tissue just inside the anus. Internal haemorrhoids may protrude (prolapse) through the anus. Most prolapsed haemorrhoids will shrink back of their own accord but those that prolapse permanently (3rd degree) may require treatment. Prolapsed haemorrhoids may leave empty redundant skin behind (skin tags) which can cause irritation. Haemorrhoids present with bright red blood on the stool or toilet paper, or the gloved finger after evacuation or digital rectal stimulation, and may cause pain, itching and autonomic dysreflexic symptoms in individuals with SCI above the sixth thoracic vertebra. Haemorrhoids are associated with chronic constipation or diarrhoea, straining at stool, prolonged toileting and low dietary fibre intake and become more common with age and in pregnancy (see glossary for grading). They are very common in individuals with neurogenic bowel dysfunction - reported by around 40% of individuals with SCI (Coggrave 2009). The individual should be referred to an appropriate specialist for assessment and treatment if the haemorrhoids become problematic.

6.6 Megacolon/megarectum

This term describes an abnormally distended colon or rectum seen as dilated gas-filled loops on xray. It is associated with older age (greater than 50 years), longer duration of spinal injury (10 years or longer) and symptoms of abdominal distension, pain and constipation, use of multiple laxatives, anticholinergic medication and use of calcium-containing antacids. It may underlie the deterioration in bowel function often seen in chronically spinal cord injured individuals, manifesting as prolonged duration of management and difficulty with evacuation. The condition is relatively common, and may be associated with sigmoid volvulus, faecal impaction, autonomic dysreflexia, dyspnoea from diaphragmatic splinting, weight loss and chronic malnutrition. It is also seen in younger individuals with spina bifida where bowel function has not been managed effectively from an early age (Shepherd et al 1983). Colostomy may be considered where these complications result in recurrent hospitalisations (Harrari and Minaker 2000).

6.7 Rectal Prolapse

This term refers to one of three entities: full-thickness rectal prolapse where the full-thickness of the bowel wall protrudes through the anus; mucosal prolapse where only the mucosa protrudes; or internal prolapse or intussusception where the collapsed tissue "telescopes" on itself but remains within the colon. The individual may report a mass protruding from the anus after evacuation which may retract spontaneously or require reduction manually. External prolapse often results in faecal incontinence and increased mucous production/leakage resulting in wetting and soiling of clothing. Internal prolapse may cause a feeling of incomplete evacuation (Medscape Reference Drugs, Diseases and Procedures 2010, accessed Feb 2012). Prompt onward referral for a surgical opinion is essential.

6.8 Anal fissure or tear

A tear or linear ulcer in the skin lining in the anal canal (NHS Clinical Knowledge Summaries (CKS) 2011, Gordon and Nivatvongs 2007). Anal fissure can be extremely painful (Steggall 2008) in those with intact sensation. Anal pain occurs with defecation and is severe and sharp on passing a stool, commonly followed by deep burning pain

that can persist for several hours afterwards. In patients with impaired sensation this may manifest as increased spasm and autonomic dysreflexia in those susceptible. Bleeding may occur with defecation and is usually seen as a small quantity of bright red blood on the stool or toilet paper. External examination of the anus carried out by gently parting the buttocks may reveal a superficial tear with clean edges if the fissure is acute (present up to 6 weeks); if chronic (present more than 6 weeks) the tear will be deeper and wider with muscle fibres at the base. There may be a skin tag if the fissure has been long standing. Primary fissures are associated with increased anal tone which also hinders healing, secondary fissures are related to passage of constipated stool in this patient group (Derbyshire 2007). For fissures present more than 1 week, glyceryl trinitrate 0.4% rectal ointment daily for up to 8 weeks may be prescribed to reduce anal tone and speed healing but with a 50% risk of associated headache (NHS CKS 2011). The individual's bowel management should be reviewed and evaluated to ensure that constipation is eradicated and that digital interventions are used appropriately.

6.9 Autonomic Dysreflexia

Autonomic dysreflexia is an abnormal sympathetic nervous system response to a noxious stimulus below the level of injury in individuals with SCI above the sixth thoracic vertebra. An acute episode results in rapidly rising blood pressure with accompanying risk of brain haemorrhage and death (Kavchak-Keyes 2000) and is regarded as a medical emergency. Among susceptible individuals, 36% report dysreflexic symptoms occasionally and 9% always when they conduct bowel management (Coggrave et al 2008). The higher the level of spinal cord injury, the greater the risk of autonomic dysreflexia and the more severe the symptoms. Raised blood pressure during bowel management without symptoms has been recorded (Furusawa 2007, Kirshblum 2003). However, treatment is not necessarily required in the absence of symptoms (Kirshblum 2003), hence recording blood pressure when undertaking this intervention has little benefit. The patient should be observed for symptoms of autonomic dysreflexia which include flushing, sweating and blotchiness above the lesion, chills, nasal congestion and headache. Some individuals experience these symptoms mildly whenever they evacuate their bowel. Less often, where the bowel is loaded with constipated stool or severe haemorrhoids or anal fissure are present, acute autonomic dysreflexia may occur in response to bowel care. Bowel distension caused by impaction, rectal stimulation, suppository insertion and enemas have all been reported as triggering autonomic dysreflexia (Colachis 1992). The cardinal sign of acute autonomic dysreflexia is a rapidly developing severe headache. In this instance bowel management should be stopped and a medical assessment undertaken. If acute autonomic dysreflexia persists after stopping the procedure this should be treated promptly, according to local policy, but usually using sublingual nifedipine or a glycerine trinitrate patch or spray. Ano-rectal problems should be treated appropriately and steps should be taken to ensure that the bowel care programme is effective and any faecal loading or constipation is eradicated. Bowel management must still be continued on a regular basis; local anaesthetic gel, applied prior to digital interventions may reduce or eradicate the autonomic dysreflexic response during bowel care (Cosman 2005), though this is not suitable for prolonged use (BNF 2008). Autonomic dysreflexia associated with bowel management is most likely to occur in response to ineffective bowel care due to withholding of essential interventions.

7. What is neurogenic bowel management?

‘Bowel management’ is the regular delivery of a programme of planned interventions designed to pre-emptively achieve effective bowel evacuation at a specific frequency in individuals with central neurological conditions, reducing its impact on quality of life by avoiding faecal incontinence and constipation, minimising associated morbidity and facilitating carer input where required

7.1 Aims of neurogenic bowel management

The aims of bowel management in central neurological conditions are to:

- avoid faecal incontinence
- minimise or avoid constipation
- manage evacuation within a reasonable time, generally suggested to be up to one hour (Stone 1990)
- optimise comfort, safety and privacy
- fit management in with the lifestyle of the individual, enabling activity without fear of faecal incontinence
- provide an effective routine that is acceptable to the individual, promoting autonomy, verbal and, where possible, physical independence
- avoid autonomic dysreflexia and minimise other secondary complications
- achieve regular and predictable emptying of the bowel at a socially acceptable time and place, facilitating the involvement of carers where required
- use the minimum necessary physical and pharmacological interventions
- maintain short and long-term gastrointestinal health
- identify appropriate transfer methods, equipment and adaptive devices that promote independence through multidisciplinary team working
- evaluate the outcomes of bowel management objectively by recording episodes of faecal incontinence, duration of bowel management episodes and stool form as described by the Bristol Stool Form Scale (Heaton 1992)
- through education, to provide the individual with a ‘toolkit’ of knowledge with which they can manage and adapt their bowel care in the long-term

8. Who should assess the individual with neurogenic bowel dysfunction and plan their management programme?

In a healthcare setting, meeting the needs of individuals with central neurological conditions is a multidisciplinary team activity. However, assessment of the patient's bowel care needs and the development and evaluation of a bowel management programme should be undertaken by a specialist healthcare professional with a continence and/or neurology background and suitable skills, knowledge and interest (Wiesel et al 2001). In specialist inpatient settings, such as spinal cord injury centres, or specialist nurses in stroke, MS or PD settings, experienced registered nurses will plan neurogenic bowel management according to established protocols, adapted to meet the needs of the individual, in collaboration with that individual.

Actual day to day bowel care may be delegated to other carers, for instance healthcare assistants and suitably trained carers in hospital and community settings where their competence can be assured (RCN 2008) or to the patient themselves or their family, or their directly employed care-givers. Many individuals will conduct their own care or direct their own care with a high degree of autonomy.

Good practice dictates that any changes to the bowel management plan should not be made without consultation with the individual themselves and where possible and appropriate with the initial assessor or prescriber.

Development of an individualised bowel management programme requires assessment of the individual, planning of interventions and evaluation of outcomes. These activities are cyclical, with regular evaluation and reassessment informing planned care. The cycle continues until an optimal programme has been developed. The need for bowel management is life-long in individuals with neurogenic bowel dysfunction; re-evaluation and modification of the programme will be required at intervals as appropriate (NICE 2007).

8.1 Assessment for bowel care

When assessing the individual for their bowel management and rehabilitation needs the following factors are addressed:

- Current bowel function – sensation of rectal fullness/need for evacuation, voluntary control of anal sphincter, frequency of bowel evacuation, stool consistency
- Bowel habit prior to onset of central neurological condition
- Previous medical history – including obstetric history, chronic bowel disease, cancer, abdominal or anorectal surgery
- Medication
- Diet and fluid intake, ability to eat a full diet, allergies or intolerances
- Level of activity - general mobility, exercise, standing, passive movements
- Level of physical independence – transfer ability, balance
- Communication and cognitive ability
- Level of independence and need for carer input
- Lifestyle and personal goals – cultural, sexual, work or educational roles
- Psychological and emotional factors
- Moving and handling risk assessment
- Home and care circumstances – availability of carers, need for home adaptations, equipment

8.2 Planning care

- Obtain consent - where care is to be given by a carer of any kind, the informed voluntary consent of the individual is essential. Consent should be documented as part of the initial assessment and verbal consent should also be obtained on every occasion that bowel care is given

- Plan appropriate teaching for the individual and for carers as required
- Identify and record timing and location for bowel management – toilet, commode, bed, combination
- Plan a bowel programme, selecting appropriate interventions for evaluation
- Identify need for and organise provision of equipment
- Identify care giver, if required

8.3 Evaluating bowel care

Recording objective outcomes of bowel management is essential during the development of the programme. These are:

- Frequency, timing, volume and stool type of episodes of faecal incontinence (Bristol Stool Form Scale)
- Duration of bowel management episodes
- Stool form recorded using the Bristol Scale
- Frequency of nil results from attempted evacuation
- The Neurogenic Bowel Dysfunction Scale can also be used (Krogh et al 2006)

Additional subjective measures include:

- Does the individual experience a feeling of incomplete emptying?
- Have interventions been minimised as far as possible?
- Is the patient as independent as possible?
- Is the individual satisfied?
- Is the programme sustainable where carer input is required?

8.4 How often should the bowel programme be evaluated?

- In an acute setting – e.g. following spinal cord injury or after a stroke:
  - On cessation of spinal shock in individuals with acute SCI (see glossary for further information on spinal shock)
  - Changes in level of consciousness
  - Changes in physical functioning

- On commencing rehabilitation:
  - When the patient commences mobilisation
  - When the patient is ready to begin bowel management on the toilet/shower chair
  - When the patient is progressing to independent self care
  - If a patient changes to oral intake from nasogastric/gastrostomy feeding
  - If the current routine is ineffective
  - At any time where it seems appropriate but at least fortnightly throughout any acute or rehabilitation admission

- For community living individuals:
  - In individuals with spina bifida assessment for bowel management starts in infancy and includes observation during transition from breast to bottle feeding and during weaning
  - When the current routine is not effective – i.e. faecal incontinence, constipation, prolonged duration (regularly more than 1 hour)
  - In the light of changing levels of independence/dependence
  - During general routine follow-up
  - Following a persistent unexplained change in bowel habit i.e. incontinence, change in stool form, colour or odour or bleeding per rectum. Changes that have persisted for 4 weeks or have not responded to 3 separate adjustments to the usual programme may be indicative of bowel cancer and should be investigated (www.cancerscreening.nhs.uk). Rapid appropriate onward referral for investigation is essential

8.5 Standards for documentation of bowel management (conducted by employed carer)

- Frequency of faecal incontinence will be recorded
- The Bristol Scale will be used to record the outcome of all bowel management episodes
- The duration of all bowel management episodes will be recorded
- Acute setting – documentation of assessment and planned care within 24 hours of admission
- Community living individuals, who receive assistance with bowel management from a district nursing service, will have a documented bowel function assessment and a bowel management plan, available in their own home as well as in appropriate professional records, re-evaluated and documented at least annually

9. Who can give neurogenic bowel care?

Most bowel management is conducted in the community, in people's homes. In this setting bowel management can be carried out by the individual for themselves if physically able or the individual can verbally direct their bowel care when given by another person.

Bowel care, including digital rectal interventions, can be given by a personal assistant (PA), carer, nurse or other person chosen by or acceptable to the individual. A care-giver provided by a statutory agency or care agency should have received appropriate training, provided by a qualified healthcare practitioner competent in this area of care, and be deemed capable to meet the individual's bowel care needs and promote their autonomy. As an employee of a healthcare organisation or agency, the competency of the care giver should be established by the employer and evaluated at regular agreed intervals (CQC 2010); vicarious liability for the employee's actions then lies with the employer.

Where an individual directs their own care and employs personal assistants through the Direct Payments scheme, training of this kind may not be practical. It is for the individual who employs the carer to provide training and to ensure they are satisfied with the capability of the carer.

In the community setting, the individual receiving care also has a responsibility to ensure they are satisfied that the carer is capable of giving their care prior to allowing any interventions to be undertaken for them. Where possible and appropriate the individual who will receive the care should be involved in the training programme of their carer. This will help to ensure a shared understanding of the care to be undertaken.

Care provision in the community must be sustainable and provided in a way that optimises the freedom and flexibility of the individual in order to minimise the impact of bowel dysfunction upon the quality of life of the individual and their family (NMC 2008, RCN 2008, NICE 2007, Williams 2010).

Individuals with central neurological conditions may be admitted to inpatient care settings for many reasons, associated or not with their neurological condition. A bowel management programme which meets the needs of the individual must be maintained during admission to non-specialist acute healthcare settings. Holistic assessment on admission should identify the need for management of neurogenic bowel dysfunction. It is important to recognise that many individuals with neurogenic bowel dysfunction are experts in their own care (NRLS 2012), and an existing effective bowel management programme should be maintained. Where the current management is not effective, an alternative programme should be planned in collaboration with the individual to meet the needs identified in the assessment.

It is recommended as continuing best practice that NHS organisations providing acute care have a policy for manual evacuation of stool and ensure that suitably trained staff are available (NRLS 2012).

Failure to meet the needs of individuals for effective bowel management in any healthcare setting may be seen as neglect, under the definition of abuse in the NMC statement on 'Practitioner-Client Relationships and the Prevention of Abuse' (NMC 2002).

The knowledge and skills required for delivery of bowel management are outlined below. The level a carer is expected to meet will vary depending on their role.

Knowledge required

- Impact of bowel dysfunction and its management on quality of life
- Familiarity with, and acceptance of, the concept of autonomy
- The importance of communication
- Aims of bowel management
- An understanding of the interventions that can be used including the role of oral and rectal medications, in relation to the specific recipient of care or more generally depending on level of responsibility
- The prevention, recognition and management of autonomic symptoms in individuals with spinal cord injuries above the 6th thoracic vertebra
- The recognition of complications such as constipation, faecal impaction, haemorrhoids (piles)
- The importance of hygiene during bowel management and principles of infection control
- Safe disposal of waste

Skills required – independently or under direction

- Effective and appropriate communication including feedback to the individual, and recording of bowel management outcomes
- Use of interventions listed above
- The management of autonomic symptoms and acute autonomic dysreflexia
- Preserving skin integrity during bowel management
- Moving and handling skills
- The use of appropriate equipment

10. What interventions can be used for management of neurogenic bowel dysfunction?

Establishing a regular routine or programme is fundamental to gaining control over continence and avoiding the build up of stool in the colon.

10.1 Establishing a bowel management routine or programme

The bowel routine or programme is a complex intervention comprised of a range of sometimes invasive interventions used on a regular predetermined frequency. While the gastrocolic reflex is strongest after breakfast, the time of day for bowel management is not otherwise significant; it should be fitted around the individual's other activities and routines, and be sustainable. The frequency with which the programme is conducted will vary depending on the needs of the individual; those with areflexic bowel function may manage their bowel daily or twice daily (sometimes more) while individuals with reflex bowel function may evacuate their bowel on a daily or alternate day routine (Coggrave et al 2008). Less frequent or irregular bowel management may contribute to constipation (Coggrave et al 2008). However, overly strict adherence to a rigid bowel routine is associated with increased impact on quality of life (Coggrave et al 2008) and the capacity for flexibility should be maintained where possible. In infants with spina bifida implementing 'potty training' at the usual age will help to establish a routine.

10.2 Optimising diet and fluids

Many individuals with neurogenic bowel dysfunction report that they manipulate their diet (Coggrave et al 2008) to assist their bowel management even though there is no robust evidence to support any dietary intervention. Hence in this population it is generally advised that a diet containing five portions of fruit and vegetables and significant levels of whole grain foods, such as wholemeal bread or unrefined cereals, each day should be encouraged, in accordance with the government's '5 a day' strategy (Department of Health 2003 and 2012). Stool consistency can then be assessed and the diet adjusted accordingly to achieve an appropriate stool consistency. Individuals with reflex bowel function are encouraged to aim for a soft-formed stool consistency (Bristol Scale 4 – see glossary (Heaton et al 1992), while those with areflexic bowel function are more likely to avoid faecal incontinence if they aim for firmer stools (Bristol Scale 2-3 – see glossary (Heaton et al 1992). Digital removal of faeces is also facilitated by a firmer consistency.

With regard to fluid intake, it has been suggested that individuals with neurogenic bowel dysfunction require additional fluid compared to other people (Consortium for Spinal Cord Medicine 1998). However, there is no research evidence to support this, and fluid intake may be determined by specific bladder management approaches. The British Dietetic Association recommends between 1.5L and 2.5L of fluid daily for the general adult population, depending on level of activity and prevailing weather conditions (BDA 2006). Urine colour is correlated with the concentration of urine; urine of a 'pale straw colour' indicates adequate hydration (BDA 2007), and is a simple 'rule of thumb' which is useful to patients. However, there is no evidence that extra fluids reduce a tendency to constipation unless an individual is clinically dehydrated.

See appendix 1 for further information on managing diet

10.3 Gastrocolic reflex

The gastrocolic reflex is a reflexic response to the introduction of food and/or drink into the stomach, resulting in an increase in muscular activity throughout the gut (Harari 2004) which can result in movement of stool into the rectum ready for evacuation. While the evidence for this response in individuals with neurogenic bowel dysfunction is equivocal (Aaronson et al 1985, Glick et al 1984, Menardo et al 1987) it is still regarded as worthy of trial in assisting with management (Walter et al 2003, Harari et al 1997). The individual is advised to take some food and/or drink 15 - 30 minutes prior to commencing other bowel management activities. The reflex response is usually strongest after the first meal of the day but can be stimulated by eating and drinking at any time.

10.4 Abdominal massage

The use of abdominal massage has been reported by 22-30% of individuals with neurogenic bowel dysfunction (Coggrave et al 2008, Han 1998). Physiological studies have demonstrated that massage produces a measurable response in the rectum and anus (Coggrave et al 2007a). Regular use of abdominal massage has been found to reduce constipation in individuals with Multiple Sclerosis (McClurg et al 2011). Massage is applied to the abdomen following the usual lie of the colon in a clockwise direction. Using the back or heel of the hand or a tennis ball or similar, pressure is applied and released firmly but gently in a continuous progression around the abdomen. Lighter stroking movements may also be used, which may trigger somato-visceral reflexes. Massage may be used before and after digital rectal stimulation, insertion of stimulants or digital removal of faeces to aid evacuation (Coggrave 2005). A recent review of the evidence found that 'abdominal massage can relieve constipation of various physiological causes by stimulating peristalsis, decreasing colonic transit time and increasing the frequency of bowel movements. It reduces feelings of discomfort and pain, and induces a feeling of relaxation. It has also been found to improve patients' quality of life (Lamas et al 2011). However, evidence is still lacking in regard to mechanism of action, required duration for effectiveness, and which aetiologies respond to it.

10.5 Pharmacological rectal stimulation: suppositories, enemas

Rectal stimulants are used to trigger evacuation of the bowel at the appropriate time for the individual and are essential to achieving managed continence for many people with neurogenic bowel. Oral laxatives cannot replace the function of rectal stimulants. In individuals without full control over defaecation, use of oral laxatives without planned stimulated reflex evacuation, or other method of evacuation in areflexic bowel function, often results in faecal incontinence in individuals with neurogenic bowel dysfunction.

Suppositories of some kind are reported to be used by between 32-71% of individuals with neurogenic bowel dysfunction (Coggrave et al 2008, Kirk 1997, Correa and Rotter 2000). Preserved anorectal reflexes respond to pharmacological stimulation, which vary in the speed and effectiveness of the evacuation they produce (Amir et al 1998, House and Steins 1997, Frisbie 1997, Dunn and Galka 1994). It is a general principle to use the gentlest form of stimulation possible in order to achieve timely evacuation, holding more powerful stimulants in reserve for problem-solving (Ash 2005). However inadequate pharmacological stimulation can lead to the requirement for more digital stimulation, so both forms of stimulation should be considered together when deciding on the appropriate pharmacological stimulant for an individual.

Available rectal stimulants include:

- Glycerin suppositories act as a mild local stimulus and lubricant (BNF 2008) and usually produce a response in around 20 minutes
- Bisacodyl suppositories deliver a stimulant laxative to the rectal wall resulting in increased gut motility (BNF 2008). Bisacodyl suppositories with a polyethylene glycol base are reported to act more rapidly than those with a hydrogenated vegetable oil base (Frisbie 1997, House and Stiens 1997, Stiens 1997) but are currently not available on prescription in the United Kingdom; bisacodyl in a vegetable oil base produces a response in approximately 30 minutes
- Lecicarbon E is a carbon dioxide emitting suppository which stimulates contraction of the rectum within approximately 15 minutes
- Small volume enemas (microenemas), such as docusate enemas (Norgalax) have been reported to be safe and effective (Dunn and Galka 1994), and more effective than either glycerin or bisacodyl suppositories (Amir 1998). Sodium citrate and sorbitol microenemas (Micralax) are commonly used. Studies of efficacy of suppositories and enemas in this population are lacking. The principle of using the gentlest stimulant that is effective should be followed

- Large volume phosphate enemas are not used routinely as retention is not usually possible and autonomic dysreflexia may be triggered in susceptible individuals (Ash et al 2006, Steins et al 1997), onset of action may be unpredictable and they may cause watery stools and abdominal cramping. Over-distention of the colon or rectum, rectal trauma, and electrolyte imbalance have very rarely been reported in adults using phosphate enemas (Paran et al 1999, Davies 2004, Wiesel and Bell 2004). However, when faecal impaction occurs, phosphate enemas may be used to help resolve the impaction in conjunction with oral treatment; in some individuals where other rectal stimulants are no longer effective and other methods of management are inappropriate, ongoing use may be required. The reasons for ongoing use should be documented along with evidence of evaluation of other methods

Rectal stimulants alone are seldom sufficient to prompt complete reflex evacuation; most individuals also require digital stimulation or digital evacuation of stool (Coggrave et al 2008).

10.6 Digital rectal stimulation

Use of digital rectal stimulation is reported in 35–50% of individuals with neurogenic bowel dysfunction after SCI (Coggrave et al 2008, Correa and Rotter 2000, Han et al 1998, Mathews 1997). Digital rectal stimulation is a technique used to increase reflex muscular activity in the rectum thereby raising rectal pressure to aid in expelling stool, and to relax the external anal sphincter, thus reducing outlet resistance (Korsten et al 2007, Coggrave 2005, 2007a, 2008, Consortium for Spinal Cord Medicine 1998). It is used to stimulate the movement of stool into the rectum and to initiate defaecation at a chosen time and relies upon the presence of reflex bowel activity; it is only available in individuals with reflex bowel dysfunction. While some authors suggest it can replace the use of pharmacological rectal stimulants (Bedbrook 1991) others have reported that it may not be as effective in all individuals with reflex bowel function and is associated with longer duration of bowel management (Coggrave et al 2008).

Digital rectal stimulation is performed by inserting a gloved, lubricated finger gently through the anal canal into the rectum and slowly rotating the finger in a circular movement, maintaining contact with rectal mucosa (Consortium for Spinal Cord Medicine 1998, Weisel and Bell 2004) and gently stretching the anal canal. The stimulus is continued until relaxation of the external sphincter is felt, flatus or stool passed, or the internal sphincter contracts (a sign of colonic activity) and is seldom required for more than 15-20 seconds; longer than one minute is rarely necessary (Stiens 1997). The finger is then removed to allow reflex function to occur. The stimulation may be repeated every 5–10 minutes approximately until evacuation is complete. The number of times this intervention can be used within one bowel management episode is contentious. Between three and six episodes would be within the range often reported by individuals. However there is no evidence on which to base a recommendation and experience suggests that there is considerable variation between individuals as to what is required. Therefore the needs of the individual should be the prime consideration; digital rectal stimulation should be repeated until either reflex evacuation is complete and there is no more stool in the rectum or until it is evident that the reflex has ‘tired’ and is not effective in prompting reflex evacuation of stool present in the rectum. In this event digital removal of faeces should be employed to ensure that the rectum is empty to avoid faecal incontinence or discomfort. For this technique to function optimally the stool should be Bristol Scale 4 (bulky, soft-formed); looser stool and constipated stool both result in less effective responses. Digital rectal stimulation may be performed when sitting over a toilet, shower chair or commode, or when lying by a carer or by the patient. There is no evidence to suggest that stimulation in either position is more successful or harmful than the other, and practice should be individualised depending on response to interventions and an appropriate risk assessment.

See appendix 3 for digital rectal stimulation procedure

10.7 Digital removal of faeces

This intervention involves the insertion of a single, gloved, lubricated finger into the rectum to break up or remove stool (Kyle 2005). It was the most commonly used single intervention in a large survey, reported by 56% of respondents (Coggrave et al 2008), and is associated with shorter duration of bowel care and fewer episodes of faecal incontinence (Coggrave et al 2008, Haas 2005). Digital removal of faeces is recommended in the early acute phase after SCI to remove stool from the areflexic rectum to prevent over-distension

with consequent damage to later reflex rectal function (Consortium for Spinal Cord medicine 1998, Grundy and Swain 2002, Harrison 2000). It is also a necessary intervention for a majority of chronic spinal cord injured individuals, as part of a well structured bowel management programme (Coggrave et al 2007b). It has been identified as the method of choice for long-term bowel evacuation in individuals with areflexic bowel dysfunction (Steins et al 1997), and may be used for removal of stool prior to placing suppositories in individuals with reflex bowel or to complete evacuation where reflex activity alone is insufficient to empty the bowel.

See appendix 4 for digital removal of faeces procedure

10.8 Autonomic dysreflexia and digital interventions – in individuals with spinal cord injury at or above the sixth thoracic vertebra

See Section 6.9 for details regarding Autonomic Dysreflexia

Digital stimulation of the rectum and digital removal of faeces may be associated with autonomic dysreflexia in individuals with spinal cord injury at or above the sixth thoracic vertebra. Autonomic dysreflexia in response to bowel management is often associated with the presence of faecal impaction, constipation, haemorrhoids or fissures and is therefore not unavoidable. A review of the bowel management routine and evaluation of outcomes should be undertaken to identify the cause of the problem and the bowel management programme adapted to prevent further episodes.

10.9 Oral laxatives

The use of oral laxatives is reported in 60% of SCI individuals (Coggrave et al 2008); however, little research has been conducted to evaluate the efficacy of laxatives in neurogenic bowel management. Commonly used oral laxatives include:

- stimulants (e.g. senna, bisacodyl) - prompt increased bowel activity resulting in the movement of stool into the sigmoid colon and rectum. They should be taken only prior to planned evacuation of stool otherwise they may increase risk of faecal incontinence in individuals with impaired faecal continence
- softeners (e.g. dioctyl), bulkers (e.g. ispaghula husk) and osmotics (e.g. polyethylene glycol, lactulose) - aimed at modulating stool form (softeners, bulkers and osmotics), taken regularly to maintain a predictable consistency

Use of oral laxatives is associated with faecal incontinence; they are not essential for all individuals with neurogenic bowel dysfunction and should be used only when individualised assessment indicates that they may be beneficial. When oral laxatives are used, thought should be given to how the individual will manage the resulting bowel activity. For individuals who are dependent in bowel care planned evacuation is essential or faecal incontinence is inevitable.

10.10 Valsalva manoeuvre/straining

Valsalva manoeuvre or 'straining' involves forcibly attempting to exhale against a closed glottis (Weisel and Bell 2004). This technique results in a rise in intra abdominal pressures and therefore intra rectal pressure. A very short episode of straining at the beginning of bowel evacuation can be considered as part of the normal physiology of defaecation (Pocock and Richards 2006). Some individuals who lack control of the abdominal muscles are unable to perform this intervention. Some patients can strain to assist with evacuation; however straining as the main method of evacuation is associated with a high degree of incontinence, constipation and other difficulties with evacuation (Yim 2001) and should be discouraged. In addition, excessive straining can cause severe renal and cardiovascular complications, and may interfere with proper functioning of medical implanted devices such as baclofen pumps. Straining is implicated in the development of haemorrhoids and rectal prolapse. Therefore patients with areflexic bowel function need to be taught to use straining with caution, if at all (Coggrave 2005). In individuals with Parkinson's Disease straining can result in paradoxical sphincter contraction or 'anismus', and contributes to problems with stool expulsion and constipation (Sakakibara et al 2010) and is therefore counter productive. Similar problems may be seen in individuals with MS and cervical SCI.

10.11 Transanal irrigation

Transanal irrigation of the bowel can be defined as a process of facilitating evacuation of faeces from the rectum and descending colon by passing water into the bowel via the anus in a quantity sufficient to reach beyond the rectum. Two recent reviews (Christensen 2010, Emmanuel 2010) have suggested that in individuals with chronic neurogenic bowel dysfunction, irrigation outperforms more conservative methods reducing faecal incontinence and constipation, improving

quality of life. However there is currently a lack of evidence in the acute and rehabilitating neurogenic bowel population. Irrigation does not work for every individual with neurogenic bowel dysfunction and as yet robust criteria for suitability have not been identified. Long term use is not thought to impact on colonic function but use does decline over time; the reason for this is not clear (Faaborg et al 2010).

Transanal irrigation involves the introduction of water into the rectum using a pumped or gravity fed system via a rectal catheter with an integral balloon Peristeen© (Coloplast Ltd) or via a cone-shaped device Qufora© (MBH International A/S, Denmark).The rectal catheter with balloon allows the catheter to be self retaining; the catheter need not be held in place for the duration of instillation of the irrigant. The balloon helps to form a seal that aids retention of the irrigant. However, in some individuals inflation of the balloon can lead to reflex expulsion of the catheter. The cone option is less likely to provoke reflex activity but must be held in place while the irrigant is infused requiring adequate balance, strength and flexibility. The individual must be able to sit upright over a toilet or commode for bowel care to use irrigation; while the volume of irrigant used varies widely between individuals, 500mls is a suitable starting point for adults. Irrigation can be self administered or administered by an appropriately trained carer. Transanal irrigation may be considered for individuals who experience faecal incontinence, constipation, abdominal pain associated with evacuation, bloating or prolonged duration of bowel evacuation (Christensen et al 2006). Irrigation does not rely upon retention of the fluid for effectiveness. The frequency of irrigation and volume of fluid used are individually determined for each individual. The two systems mentioned above are currently available on Drug Tariff in the UK. Transanal irrigation has been found to reduce faecal incontinence, constipation and time spent on bowel management and to improve symptom-related quality of life. Irrigation is a safe intervention and has not been shown to provoke autonomic dysreflexia in susceptible individuals (Christensen et al 2006) though it is a potential risk. There is a small risk of bowel perforation which is estimated to occur in less than 1 per 100,000 irrigations; however, individuals may irrigate daily or on alternate days for many years and risk may be cumulative. This should be discussed with the patient in the context of the choices available to them. To minimise the risk, and to promote success with irrigation, individuals with neurogenic bowel dysfunction wishing to use irrigation should be assessed, taught, monitored and supported by healthcare practitioners with appropriate expertise (Norton 2007, Coggrave 2007b).

10.12 Antegrade Continence Enema (ACE)

The ACE is a continent catheterisable stoma formed surgically from the appendix or caecum, giving access to the colon for administration of enema or irrigation for bowel management. The ACE procedure may reduce the duration of bowel care and incidence of faecal incontinence (Teichman et al 1998 & 2003, Christensen et al 2000); autonomic dysreflexia was eradicated in one case study (Teichman 1998). While common in children with spina bifida, few ACEs have been reported in adults with neurogenic bowel dysfunction and the failure rate in some studies is high (Gerharz et al 1997). They are seldom seen in adults in clinical practice.

10.13 Nerve stimulation techniques

Sacral anterior root stimulator (SARS)

The SARS has been available for several decades and though usually implanted primarily for bladder management problems after spinal cord injury it has been reported to have a very beneficial effect on bowel management for many individuals (Binnie 1991, Creasey et al 2001, Kachourbos and Creasey 2004, Liu et al 2005) (46-49). The implanted electrodes are placed on the second, third and fourth sacral anterior nerve roots and high voltage, short-lived stimulation is applied several times daily to empty the bladder; the colon is stimulated simultaneously, resulting in increased colonic activity, reduced constipation and sometimes defaecation during stimulation (Chia 1996). Implantation remains rare; just 7 of more than 1330 respondents to a recent SCI bowel management postal questionnaire reported using a SARS for bowel management (Coggrave et al 2009).

Sacral nerve stimulation (SNS)

SNS uses lower amplitude, chronic stimulation applied continuously to the sacral plexus (Kenefick and Christiansen 2004). Intact sacral nerves are required, and SNS is not effective in individuals with complete spinal cord injury (Jarrett 2004). However, some success has been seen in patients with cauda equina lesions (Gstaltner 2008). This technique is available through specialist pelvic floor centres.

10.14 Colostomy

The formation of a colostomy has been seen until recently as a last resort when dealing with neurogenic bowel dysfunction, and even as a failure of rehabilitation services (Randell et al 2001). However, a number of studies have found that the formation of a stoma can greatly improve quality of life for some individuals (e.g. Coggrave et al 2012, Rosito et al 2002). Colostomy can result in a reduction in time spent on bowel management (Coggrave 2012, Stone et al 1990) and an increase in independence in bowel care (Coggrave 2012, Kelly 1999). Despite largely positive outcomes, stomas are not without complications. These include paralytic ileus and bowel obstruction post operatively, peri-stomal hernia, diversion colitis (inflammatory changes in the redundant section of bowel) and skin rashes around the stoma causing problems with collection devices.

The discharge of mucous from the remaining defunctioned bowel can also be problematic, necessitating the use of pads or regular digital removal of the mucous or even proctectomy for some individuals (Coggrave 2012, Kelly et al 1999, Branagan 2003). Stoma irrigation can be employed to give effective control over stoma function but is underutilised in both the neurogenic and non neurogenic colostomy populations. Around 2.4% of SCI individuals in the UK have a colostomy formed for bowel management problems (Coggrave et al 2008).

11. Bowel management in early acute-onset central neurological conditions

Spinal cord injury, cauda equina syndrome and acute stroke

Bowel function following acute injury to the spinal cord will be areflexic due to spinal shock (see glossary for further information on spinal shock). The standardised approach described below should be instigated within 24 hours of admission and continued until spinal shock recedes (in spinal cord injured individuals), rehabilitation is commencing and the process of assessment and development of an individualised programme can begin.

In the individual with cauda equina syndrome and conus injuries, the bowel may be areflexic immediately and in the long term, but mixed dysfunction is also possible. Assessment and development of an individualised programme should begin when the individual is recovered from any surgery and is commencing rehabilitation.

Aims

- To prevent impairment of bowel function due to colonic faecal impaction
- To promote development of an effective bowel management programme for the future
- To inform the patient of the need for bowel care and to obtain informed consent

Immediate management

- Explain to the patient what bowel management is and its importance; obtain informed consent
- Gain verbal consent for each intervention – if unable to do so (e.g. patient unconscious), perform procedure as long as it is in the best interest of the patient after discussion with the multidisciplinary team
- Ensure privacy for performing bowel management and maintain the individual's dignity at all times – this can be difficult when on bed rest – make sure curtains are closed properly, only relevant staff are behind curtains and restrict access during bowel management. Consider the practicality of moving the patient (on the bed) to a more private area for bowel care
- Nil enterally for at least first 48 hours if the individual is at risk of paralytic ileus due to spinal shock
- Check twice daily with stethoscope for return of bowel sounds which indicate cessation of paralytic ileus associated with spinal shock
- Daily digital rectal examination to assess for and identify any changes in anal tone, sacral sensation, presence of faeces in the rectum and cessation of spinal shock
- Daily digital removal of faeces from the rectum if present
- During spinal shock a prescribed glycerin suppository may be used to lubricate the stool prior to digital evacuation if constipated, or to aid in release of flatus
- Following cessation of spinal shock in an individual with unstable spinal cord injury who remains on bed rest, remove faeces from rectum prior to inserting prescribed mild rectal stimulant (glycerine suppository) to assist in removing faeces, in reflexic bowel function (spinal cord injury above T12). In individuals with areflexic bowel function suppositories or other rectal stimulants will not elicit a reflex response and should not be used for routine management
- Allow at least 20 minutes for the prescribed mild rectal stimulant to work – time bowel management to coincide with log rolling the patient for hygiene and skin checking at a regular time of day. Suppositories can be given whilst patient is flat on the bed and bowel emptying can be performed when rolled. This minimises disturbance and handling of the patient

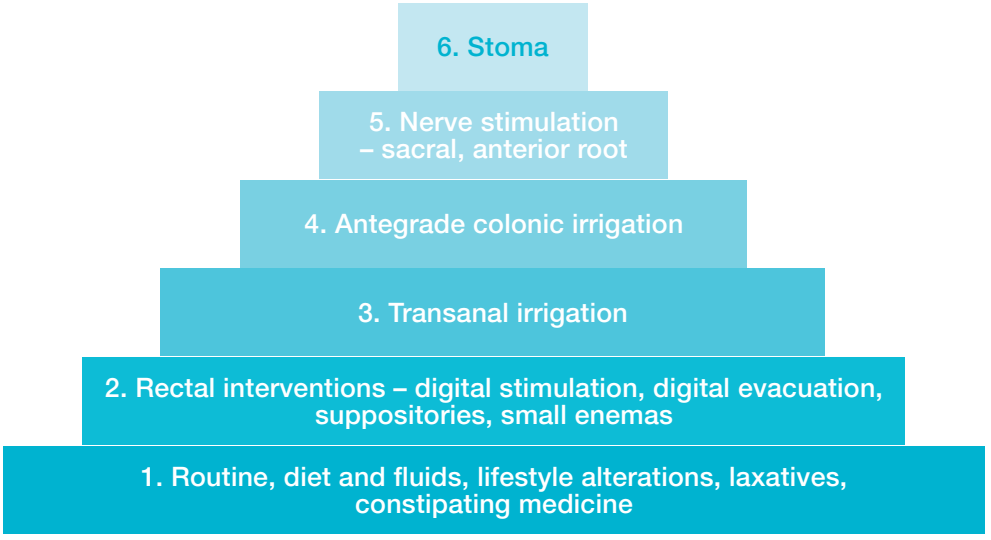
- Gastrocolic reflex and abdominal massage may promote evacuation, and oral laxatives may be required
- Bowel care should be conducted even if the rectum is empty on initial checking
- In patients with spinal cord injury, maintain spinal alignment at all times and ensure correct positioning when finished
- Check skin around peri-anal area – make sure skin is cleaned and dried adequately and use barrier creams if necessary, especially if stools are loose
- Record bowel management interventions used, duration of care and use the Bristol Scale (Heaton et al 1992) to describe the stool, record stool passage at times other than during bowel management as faecal incontinence
- Liaison with a rehabilitation team at this stage will help establish an appropriate bowel regime for the patient which can then be maintained through rehabilitation and beyond, minimising disruption
- Re-evaluation of the bowel programme should occur:
  - when spinal shock recedes so that assessment can lead to the development of an individualised bowel programme
  - when oral intake/diet changes
  - following changes in medication

12. How is an individualised bowel care programme developed?

Bowel management interventions are chosen following assessment of the individual's needs and evaluation will usually start with the most simple and least invasive options.

The pyramid below illustrates a generally accepted hierarchy of interventions. It reflects the level of complexity, invasiveness, risk and reversibility of the various interventions while acknowledging issues of cost and evidence of benefit. Conservative management encompasses levels 1 and 2; these are simple, low cost interventions which will meet the needs of a significant proportion of individuals at least in the short term. Individuals will usually but not necessarily work through these options before progressing if required to higher levels. Not all levels are appropriate to all individuals and the pyramid does not represent a strict pathway. Movement up or down the pyramid is guided by ongoing assessment and evaluation.

Choice of intervention does not depend solely on the specific bowel dysfunction but will also be determined by mobility, hand function, independence, carer availability, home setting and the personal preference of the individual. As the neurological condition of the individual changes, and as they age and possibly develop other health concerns, their needs regarding bowel management will change and the interventions they choose may change. Beyond conservative methods, not all interventions are supported at every centre where individuals may be treated. Appropriate onward referral to other specialist services when the needs of the individual can no longer be met in a particular setting is essential.



Hierarchy of interventions for neurogenic bowel management (after Christensen, 2006b)
NB Not all levels are appropriate to all individuals and the pyramid does not represent a strict pathway – movement up or down the pyramid is guided by ongoing assessment and evaluation.

12.1 Conservative management

Conservative management involves developing a routine which combines a number of the interventions described in Section 10. Example plans for combining selected interventions for conservative management of reflex and areflexic bowel dysfunction are given below.

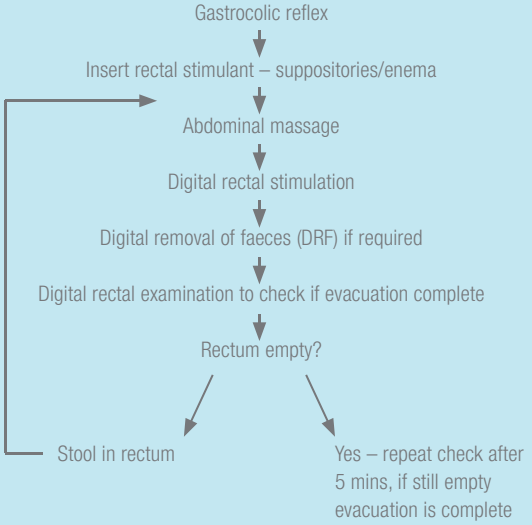
Conservative reflex bowel management

Bowel evacuation can be produced by the use of pharmacological rectal stimulants and digital rectal stimulation (Shafik et al 2000), or a combination of both (Coggrave et al 2009), but often must be followed by digital removal of faeces (DRF) to ensure complete evacuation (Coggrave et al 2009, Haas et al 2005). The optimal combination should be developed on an individual basis. Manipulating stool consistency through diet, fluids and, if necessary, medication to achieve Bristol Scale 4 produces the optimal stool for effective reflex bowel function. Establishing a regular pattern for bowel care helps to ensure that stool is present in the rectum and sigmoid colon ready for evacuation at the chosen time. This can be assisted if required by the use of stimulant laxatives as part of each discreet bowel management episode.

Outline plan for reflex bowel management programme

Daily or alternate day at a regular time
Attention to diet
Regular oral medications for stool consistency if required
Stool consistency Bristol Scale 4

Stimulant laxatives 8-12 hrs before planned bowel care if required
Hot drink and/or food 20-30 minutes before bowel care



Conservative areflexic management

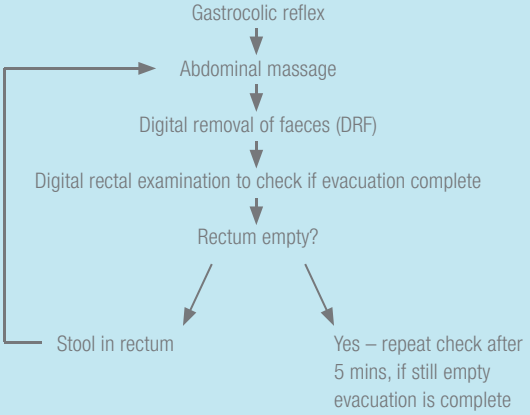
As there are no preserved anorectal reflexes, pharmacological or digital stimulation of the anorectum are not effective. Digital removal of faeces is the basic physical intervention used to achieve evacuation and therefore continence. Use of straining/Valsalva manoeuvre should be discouraged.

To facilitate digital removal of faeces, and to reduce the risk of 'stress' incontinence due to exercise or other physical exertion (e.g. transferring) resulting from the areflexic, relaxed anal sphincters, individuals are recommended to aim for a firm stool (Bristol Stool type 3) (Ash et al 2006, Consortium for Spinal Cord Medicine 1998).

Outline plan for areflexic bowel management programme

Daily or twice daily at a regular time
Attention to diet
Regular oral medications for stool consistency if required
Stool consistency Bristol Scale 2-3

Stimulant laxatives 8-12 hrs before planned bowel care if required
Hot drink and/or food 20-30 minutes before bowel care



12.2 Where should bowel management be conducted?

Bowel management may be performed on the bed or over a toilet or commode. The location should optimise safety, efficacy and acceptability for all parties involved, but with an emphasis on the individual's choice. Most individuals have an understandable preference for toilet use and the evidence suggests that for most patients, bowel management in the upright position is significantly quicker than when lying down (Coggrave 2007a), however the benefits need to be balanced against the hazards.

Assessing for independent use of the toilet for bowel care:

- Hand function: has the patient sufficient hand function to perform digital interventions? These require both a degree of motor power and some sensation in the fingers, which will exclude many individuals with impaired hand function i.e. individuals with complete SCI above C8. While some individuals may achieve reliable emptying after rectal stimulant insertion without the need for digital checking or further digital stimulation, many do require these additional interventions. There are devices available to insert suppositories/microenemas, and to assist with cleaning, but there is no aid available to help with digital checking/stimulating
- Ability to independently access the toilet: an individual may sit directly on the toilet or sit on a shower chair over the toilet. Use of a shower chair can reduce the need for transfers between the wheelchair/shower chair/toilet. However, shower chairs can be difficult to balance on for self care and while self management can be learnt using a shower chair, this will limit future lifestyle options if toilet use is not also learnt; while portable shower chairs are available, it can be difficult to take a shower chair with you everywhere you go and this then necessitates carrying out bowel care whilst in bed. Wherever possible the individual should be taught to transfer on and off the toilet itself. Falls from the toilet are fairly common and can cause significant injury (Nelson et al 2003, Vestergaard et al 1998)
- Availability of suitably adapted toilet facilities: wheelchair accessibility, handrails and a padded/contoured toilet seat. A home visit by an occupational therapist may be required
- Risk to skin integrity: all individuals with diminished/absent sensation and prolonged toileting should use a pressure-relieving seat whether using the toilet or a shower chair (Slater 2003). This will reduce the risk of pressure damage to the skin but not eliminate it. Individuals with a history of skin damage and resultant scarring may not tolerate even a short sitting time safely. Minimising duration of bowel care through an effective and timely bowel management programme is essential

Assessing for carer assisted/dependent bowel care:

- There are considerable moving and handling considerations here that extend beyond transfers (Ash et al 2006)
- Is use of a shower chair possible - use of a shower chair will minimise transfers and optimise carer access to the anal area. This can greatly reduce the moving and handling risks for care givers. Shower chairs are available with the opening to the side, front or back and can be selected to facilitate access to the anal area, depending on the individual's posture
- Does the physical environment and patient's size and shape allow easy and safe access for all interventions required by the individual: insertion of rectal stimulants, digital rectal stimulation, checking and cleaning (Ash et al 2006)
- Is a carer constantly available during the procedure? Can the individual safely be left alone for periods during bowel management?

General factors to consider:

- Patient/carer motivation
- Skin condition
- General health/frailty (i.e. postural hypotension, extreme old age)
- Degree of spasticity
- Balance
- Home circumstances: privacy and dignity, accessibility, availability of suitable equipment

13. What should be recorded about bowel management?

Good record keeping is integral to the provision of safe and effective care (NMC, 2010, p6). It facilitates continuity of care, identification of risks and problems at an early stage (RCN, 2008) and provides an accurate account of care planning and delivery.

Good record keeping is essential for development and evaluation of the bowel programme. During development and when the individual is an inpatient in any setting the details of the bowel programme and any changes to it should be clearly recorded in the healthcare record.

In the community, an independent individual is well advised to record the outcomes of bowel care when there is a problem; this will facilitate re-evaluation. Otherwise such recording is not necessary.

Where some or all of the bowel care programme is delivered by an NHS or agency care giver in the community, a record of the bowel programme should be available in the patient's home as well as in appropriate professional healthcare notes; this promotes continuity of care and identification of problems. The details of outcomes should be kept in the home for ease of access and review with the individual receiving care.

The following should be recorded in relation to the individual's bowel management programme:

- Frequency of bowel care e.g. daily/alternate days
- When: time of day that bowel care takes place
- Who provides the bowel care e.g. District Nurse, Carers
- Where: location where bowel care takes place e.g. in bed, over a toilet/commode
- Equipment required e.g. shower chair with aperture at the back
- Use of rectal stimulants (type, amount and timing in relation to bowel care episode)
- Interventions to be used and the order of their use (abdominal massage, digital rectal stimulation, digital evacuation, irrigation – fluid volume, rectal catheter balloon inflation if relevant)

The following objective outcome measures are essential for evaluation of the programme:

- Episodes of faecal incontinence: episodes per day and timing of these in relation to bowel care e.g. 3 hours after bowel care completed, after a meal. Stool type (Bristol Scale) and volume of incontinence
- Duration of bowel care episodes (from insertion of rectal stimulant, or instigation of fluid instillation for irrigation to completion of episode – not including clean-up time)
- Result – was stool evacuated?
- Stool form using the Bristol Scale
- Neurogenic Bowel Dysfunction Score (Krogh et al 2006)

Other relevant factors:

- Condition of anal area, presence of haemorrhoids, anal fissure, rectal bleeding etc
- Autonomic symptoms and Autonomic Dysreflexia episodes in relation to bowel care
- Abdominal symptoms – bloating, nausea, loss of appetite, pain
- Changes: to any part of the bowel management programme
- Referral: to Specialist/GP, date of referral and reason

14. What preparation does an individual need for managing their bowel dysfunction?

Individuals with long term neurological conditions may be physically independent in their bowel care and manage their own needs, or they may be dependent on a carer for assistance with some or all of their bowel management programme.

An individual who is physically dependent in bowel care should be supported to be verbally independent and take control of and responsibility for their bowel care. This means they should be able to instruct a carer in how to undertake their bowel management and to receive and act upon feedback received from the carer regarding the outcomes of management.

In either case the individual requires knowledge and understanding of:

1. The impact of their neurological condition on their bowel function
2. Theoretical knowledge of their bowel management interventions and influencing factors e.g. diet and fluids, regular routine etc
3. Practical skills for bowel management on bed and/or toilet, as appropriate
4. How and when to adjust the bowel regime
5. How to identify complications and what action to take
6. How to obtain supplies of disposable items required for bowel care in the community
7. How to access assistance from healthcare professionals if required e.g. contact details of specialist nurses providing support

15. Glossary of terms

Abdominal massage: Pressure is applied intermittently to the abdomen following the usual lie of the colon in a clockwise direction; using the back or heel of the hand or a tennis ball or similar, pressure is applied and released firmly but gently in a continuous progression around the abdomen. Lighter stroking movements may also be used, which may trigger somato-visceral reflexes. Massage may be used before and after digital rectal stimulation, insertion of stimulants or digital removal of faeces to aid evacuation (Coggrave 2005). Massage can also help to push stool out of an areflexic bowel or to move stool down ready for manual evacuation. **See Section 10.4**.

Anal Fissure: A tear or linear ulcer in the skin lining in the anal canal (NHS Clinical Knowledge Summaries (CKS) 2011, Gordon and Nivatvongs 2007). **See Section 6.8**.

Anal reflex/wink: Visible reflex contraction of the external anal sphincter in response to pinprick or touch. The presence of the anal reflex indicates a reflex or upper motor neuron (UMN) bowel dysfunction (Zejdlik, 1992, p 400).

Areflexic (flaccid) bowel: Bowel dysfunction produced by injury or damage to the spinal nerves (conus medullaris or cauda equina), at the bony level of the first lumbar vertebra (LI) and below, resulting in an areflexic bowel with a lax anal sphincter and pelvic floor. Injuries at this level damage the autonomic reflex arcs between the spinal cord and the colon and ano-rectum. The reflex activity of the sigmoid and ano-rectum are lost. The management of areflexic bowel is based on a digital evacuation of stool.

Autonomic dysreflexia/hyperreflexia: A syndrome unique to individuals with spinal cord injuries at the 6th thoracic vertebra and above. Autonomic dysreflexia is an abnormal sympathetic nervous system response to a noxious stimulus below the level of injury resulting in rapidly rising blood pressure; it is a medical emergency. **See Section 6.9**.

Bowel care: Activity undertaken to regularly evacuate stool from the rectum and sigmoid colon.

Bowel management: Regular, pre-emptive individually developed and prescribed series of interventions carried out by the patient/nurse/attendant/carer to prevent faecal incontinence and constipation, usually in individuals with neurogenic bowel dysfunction.

Bowel programme: A combination of interventions in a given order conducted to achieve the predictable evacuation of the bowel at a chosen time and frequency with the aim of promoting continence and avoiding constipation and other secondary complications of the neurogenic bowel (Bedbrook 1981; Han et al 1998; Stiens et al 1997; Zejdlik 1992).

Bristol Stool Form Scale: Evidence-based objective descriptors of stool consistency. **See Appendix 2**.

Bulboanal reflex: A reflex stimulated by squeezing the glans penis or clitoris. It results in a palpable and visible contraction of the anal sphincter (Zejdlik, 1992, p 400). A positive bulboanal reflex indicates that the reflex pathways between the bowel and sacral cord are intact. If present, it indicates reflex or upper motor neuron (UMN) bowel dysfunction.

Constipation: There is no universally agreed definition of constipation but it is associated with having infrequent bowel movements (usually suggested to be fewer than three per week), hard dry stools, sometimes small in size, which are difficult to eliminate i.e. Bristol Stool Form Scale type 1-2 (Heaton et al, NNDDIC 2011). **See Section 6.3**.

Constipation with overflow (overflow diarrhoea, spurious diarrhoea): When hard constipated stool accumulates in the colon looser stool from higher in the bowel leaks around the unmoving faecal mass, often associated with faecal soiling.

Where results from recent bowel management episodes have been constipated or absent and leakage of thin diarrhoea then occurs, overflow diarrhoea should be suspected. **See Section 6.4**.

Conus medullaris: The conical end of the spinal cord at the level of the lower end of the first lumbar vertebra.

Colonoscopy: An examination of the whole of the large bowel using a flexible endoscope. The NIHR Cancer Referral Guidelines 2006 make the following recommendations for referral for further investigation:

- In patients aged 40 years and older, reporting rectal bleeding with a change of bowel habit towards looser stools and/or increased stool frequency persisting for 6 weeks or more, an urgent referral should be made
- In patients aged 60 years and older, with rectal bleeding persisting for 6 weeks or more without a change in bowel habit and without anal symptoms, an urgent referral should be made
- In patients aged 60 years and older, with a change in bowel habit to looser stools and/or more frequent stools persisting for 6 weeks or more without rectal bleeding, an urgent referral should be made

Diarrhoea: Frequent (more than 3 times a day) passage of watery stool (Zedlick, 1992, p 413).

Digital rectal stimulation: The insertion of a gloved, lubricated finger through the anus into the rectum followed by a gentle circular motion of the finger for 20-30 seconds to stimulate reflex evacuation of stool. **See Section 10.6**.

Digital rectal examination: Examination of the rectum by inserting a gloved, lubricated finger into the rectum.

Digital removal of faeces/stool (manual evacuation): Removal of stool from the rectum using a gloved lubricated finger. **See Section 10.7**.

Faecal impaction: Faecal impaction is not well defined but 'copious formed stool in the colon (not just the rectum) which is not progressing through the colon or which cannot be expelled from the rectum are salient symptoms' (Coggrave 2010). **See Section 6.4**.

Flaccid bowel function (see Areflexic bowel): Lower motor neuron bowel resulting from damage to lower motor nerves leaving the spinal cord in the cauda equina. Sensation and voluntary control are impaired and autonomic reflex arcs between the spinal cord and sigmoid colonc/anorectum are interrupted. **See Section 5**.

Gastrocolic Reflex: A reflexic response to the introduction of food or drink into the stomach, resulting in an increase in muscular activity throughout the gut (28) which can result in movement of stool into the rectum ready for evacuation. It can be utilised by planning bowel evacuation 15-30 minutes after a meal – it is thought to be strongest in response to breakfast. **See Section 10.3**.

Haemorrhoids: Vascular swellings which may involve the internal or external venous plexuses of the anal canal (anal cushions) and may be associated with redundancy of the mucosa and/or perineal skin (skin tags).

Classification of haemorrhoids:
Grade 1 – bulge but maintain the position relative to the dentate line
Grade 2 – protrude past the dentate line on defaecation but return to normal position following defaecation
Grade 3 – require manual replacement back into position following defaecation
Grade 4 – protrude with any rise in intra-abdominal pressure and cannot be manually reduced. They have an increased likelihood of becoming thrombosed and excoriated and are prone to haemorrhage

Laxative (purgative, aperient): Medications intended primarily to increase movement of stool through the colon, by various methods.

Manual evacuation: Alternative term for 'digital removal of stool'.

Megacolon/megarectum: A condition of extreme dilation of the colon and/or rectum seen as dilated gas-filled loops on xray. Results in impaired colonic function. **See Section 6.6**.

Neurogenic bowel: 'Neurogenic bowel' is the term used to describe dysfunction of the colon (constipation, faecal incontinence and disordered defaecation) due to loss of normal sensory and motor control (2), as a result of central neurological disease or damage. **See section 5.2**

Osmotic laxative: These retain or pull fluid into the bowel making the stool wetter, thereby increasing bulk and softening stool i.e. lactulose, which should be taken regularly to maintain appropriate stool consistency.

Reflexic bowel: An upper motor neuron bowel produced by damage to the brain or spinal cord, resulting in impaired sensation and voluntary control and damage to upper motor neurons but leaving the autonomic reflex arcs between the cord and the sigmoid colon/ano-rectum intact. **See Section 5.2**.

Rectal stimulants: Pharmacological agents (suppositories or enemas) inserted into the rectum to stimulate reflex evacuation of stool. Not usually used in individuals with areflexic bowel function.

Rectocolic reflex: This is a pelvic nerve mediated pathway that produces propulsive colonic peristalsis in response to pharmacological (suppositories/enemas) or mechanical (digital) stimulation of the rectum and anal canal.

Spinal shock: The 'sudden and transient suppression of neural functions below the level of acute spinal cord lesions' (Nacimiento and Noth 1999). Spinal shock has a significant effect on autonomic nervous system activity; sympathetic activity below the level of a spinal cord lesion is suppressed (Zejdlik 1992, Sheerin 2005). The severity of spinal shock appears to be related mainly to the severity of the spinal cord lesion. The more profound the spinal shock, the slower it is to resolve, and resolution can also be delayed by post-injury complications (Atkinson and Atkinson 1996). Different types of reflex recover at different rates. The higher and more complete the spinal cord injury, the more severe the spinal shock, with neurologically complete tetraplegics suffering the most serious and wide ranging effects (Mathias and Frankel 1983).

The level and extent of the lesion is significant for two reasons. Firstly, complete lesions below the twelfth thoracic/first lumbar vertebrae will have permanent disruption of reflex function of the lower limbs, bladder, bowel and genitalia and will remain areflexic (flaccid). Secondly, patients with complete lesions above T6 will have more significant dysfunction of their sympathetic nervous system (Bravo et al 2004). Patients with neurologically incomplete lesions are generally less severely affected by spinal shock.

Immediately following the spinal cord injury all individuals will present with a loss of sensation, movement and reflex activity (spinal shock) below the level of injury. The rectum and anus will be areflexic and peristalsis will be absent resulting in a paralytic ileus. Without exception, all patients should be kept nil enterally for the first 48 hours post injury (Harrison et al 2008).

Even in the absence of bowel activity, bowel management must start on the day of admission with a digital check per rectum as part of the initial neurological examination. If faeces are present, gentle digital removal of faeces should be undertaken with ample lubrication. Caution should be used so as not to damage sensitive nerve and muscle fibres within the anal sphincter by too vigorous digital removal of faeces (DRF).

Stimulant laxatives: Directly stimulate peristalsis which pushes the stool along i.e. Senna, which is taken 8-12 hours prior to a planned evacuation.

Stool softener: i.e. Docusate sodium (Dioctyl) is a stool softener which has some stimulant effect. It enables the stool to retain more water and should be taken regularly to maintain appropriate stool consistency.

Unplanned bowel evacuation (bowel accident, faecal incontinence): When stool is passed outside of planned regular bowel care episodes. **See Section 6.2**.

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Appendix 1: Diet in neurogenic bowel management

1. Introduction

Along with other factors such as medication and exercise, food and fluid intake can strongly affect bowel activity. Faecal weight and consistency is affected by the amount and water-holding capacity of the remaining undigested material that passes into the colon, the amount of bacteria present and colonic transit times. There is a complex interaction in the way different food components affect all these factors. Good quality research in this area is lacking so much advice is based on clinical experience and best practice; an element of trial and error to determine what the individual finds effective is often required.

2. Aim of dietary assessment and alteration

To promote a diet that helps maintain appropriate stool consistency for bowel management whilst maintaining a balanced diet for health.

Objectives

- Identify dietary factors that may affect transit times and stool consistency
- Advise on changes to diet to alter stool as required
- Maintain a nutritionally complete dietary intake

3. Dietary factors that affect stool consistency

Dietary fibre is the main food component assessed in relation to bowel management. Dietary fibre is resistant to digestion in the small intestine and is therefore carried through to the large intestine encouraging transit and resulting in a wetter bulkier stool. The longer undigested waste remains in the colon the more water will be reabsorbed back into the body resulting in a harder stool. Food products that speed up colonic transit times result in less water being reabsorbed, leading to a softer stool.

Fibre can be grouped into two types, soluble and insoluble:

- **Insoluble fibre** bulks and softens stool, increasing faecal weight, and decreasing intestinal transit time in normal gut function, found in whole-grains such as wheat, maize and rice

- **Soluble fibre** is associated more with lowering blood cholesterol and blood glucose levels, found in oats, fruit and vegetables; however insoluble fibre is also found in these foods in varying proportions. In view of the associated health benefits, current guidelines are for 5 portions of fruit and vegetables daily

There is conflicting evidence regarding the effects of fibre in neurogenic bowel dysfunction.
In the non-spinal cord injured population insoluble fibre has been shown to speed up colonic transit times when combined with a good fluid intake. In a much quoted paper, Cameron et al (1996) showed this type of fibre slowing down colonic transit times in spinal cord injured individuals. However as the subjects in this study were given a very high fibre diet with added ground bran and little information was provided regarding fluid intake during the study, the findings are not very relevant to clinical practice.

However, as insoluble fibre has the greater water-holding capacity, initially adjusting the intake of this to alter stool form would seem appropriate. Keeping soluble fibre intake within current healthy eating recommendations, i.e. five portions a day, should be initially encouraged. Maintaining this soluble fibre intake, if tolerated, can help provide benefits to cholesterol and blood glucose levels. However, the quantity of fibre taken may need to be adjusted down depending on stool form and tolerance. Foods containing soluble fibre are also associated with foods containing vitamins and minerals that have many other health benefits.

Fat - Research in the non-neurogenic population suggests that a high fat diet can delay gastric emptying and slow colonic transit times. This could result in increased water re-absorption in the colon resulting in a drier stool. Diets high in dietary fat are often associated with diets low in dietary fibre, making it difficult to separate the specific effects of dietary fibre and fat. High fat diets also have a high calorific content which may result in unwanted weight gain.

Diuretic and Stimulant foods/fluids
There are some foods and fluids that can over-stimulate bowel activity or draw excessive fluid into the colon resulting in very watery stools. These include large quantities of:
Alcohol
Caffeine e.g. tea, coffee, cola, chocolate
Prunes and figs
Pure fruit juice
Sorbitol containing foods. (Sorbitol is a synthetic sweetener)

4. Probiotics
There is some evidence in the non-neurogenic bowel population that the use of probiotics can relieve symptoms of antibiotic induced diarrhoea when used during the course of antibiotics and may help to restore colonic flora after antibiotic treatment. Less rigorous studies have shown some benefit in non-specific causes of diarrhoea.

When taking probiotics it is important to make sure that they are not taken with hot food and drinks. This can deactivate the bacteria present reducing their benefit. If trying probiotics then they need to be taken daily for at least 4 weeks. If there is then no improvement in symptoms then they are unlikely to be of any benefit.

Patients with altered immune responses should be cautious about taking products containing live bacteria.

5. Enteral tube feeding
Anecdotal experience among dieticians working in the spinal injuries centres has suggested that it is preferable to start with a feed that does not contain fibre, especially in a newly injured patient. The quantity of fibre can then be increased as tolerated along similar lines to those who are taking oral diet.

Development of enteral feeding products has shown that the use of feeds containing a mixture of insoluble and soluble fibre, can help in controlling both constipation and diarrhoea; they must be introduced with caution and close monitoring as they may cause abdominal distension. It is therefore prudent to start with a feed that does not contain any fibre. Once this is tolerated at the prescribed feeding rate, it may be appropriate to gradually introduce a fibre-containing feed if it is necessary to help control bowel management, in discussion with a dietitian. There is anecdotal experience that always administering a fibre-containing feed may provide too much fibre for the patient to tolerate. Therefore, a mixture of different feeds should be administered. It is essential to maintain an adequate fluid intake with sufficient water flushes, as recommended by the dietician.

6. Manipulating diet to alter stool consistency
The flow diagrams that follow illustrate how to adjust dietary intake to alter stool consistency. Changes are best made in the order suggested. Before making dietary changes it is important to assess current fibre and fluid intake. An assessment tool can be found later in this section. It is important to make only one change at a time and to continue with that change for at least 1 week, unless major problems arise, before making further changes. Also be aware of any pre-injury diet and bowel related problems for example irritable bowel syndrome and food intolerances.

6.1 Stools too soft
Assess dietary fibre and fluid intake - using the tool provided in this section – **9.11 Fibre intake calculation**.

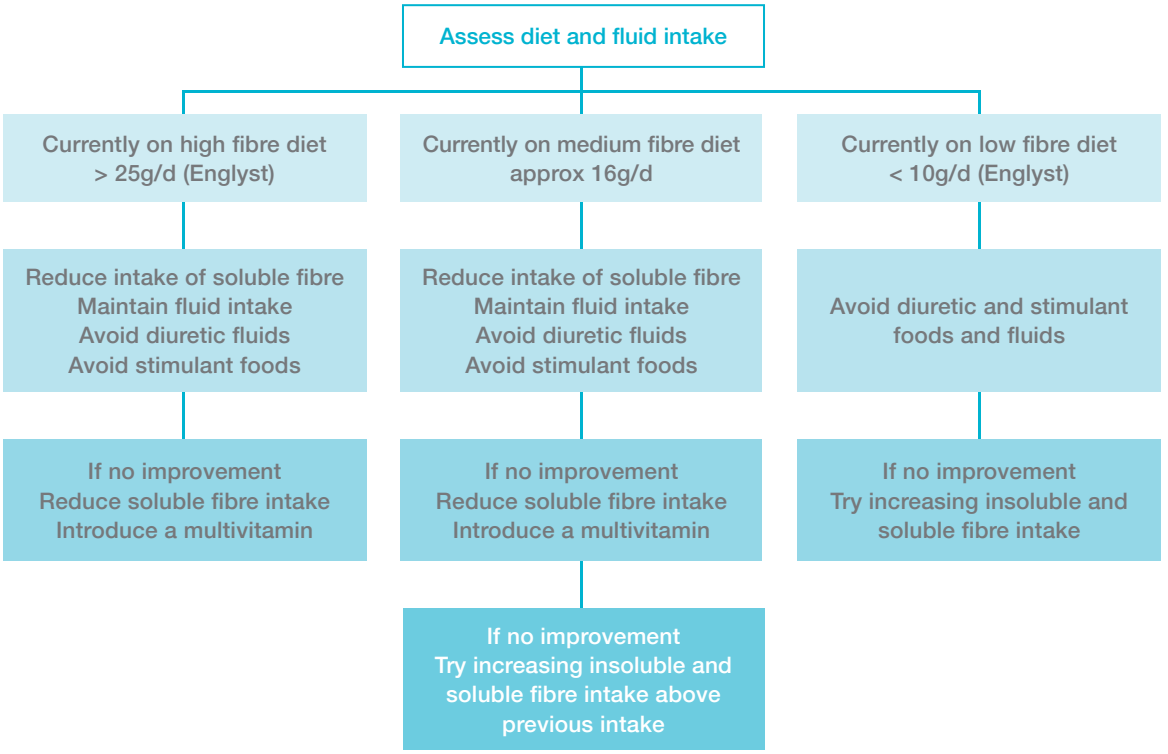
If current fibre intake is high (>25g/d) or medium (approx 18g/d) this should be reduced by initially reducing the insoluble fibre.

Soluble fibre intake should initially be maintained to ensure the recommendations of 5 portions of fruit and vegetables per day are met.

Adequate fluid intake remains important for hydration. High levels of diuretic and stimulant food and fluids should be avoided.

If reducing the insoluble fibre has shown no benefit, then reduce the soluble fibre intake. In this case a multivitamin and mineral supplement would also be used to replace those normally obtained through the fruit and vegetable intake.

Chart 1. Stools too soft



Englyst is the method of calculating fibre content used in the UK. This gives a figure about 30% lower than the AOAC method, which is used by the USA and the rest of Europe.

If the initial insoluble fibre intake was minimal or reduction of fibre has not been of benefit then steps should be made to increase the levels. This should be done gradually with an adequate fluid intake.

If all these changes make no difference return to normal diet, encourage as balanced a diet as possible. Consider soluble fibre supplements, which have been shown to reduce incontinence in community-dwelling adults with faecal incontinence (Bliss et al 2001).

When to consider anti-diarrhoeal medication
Consider anti-diarrhoeals such as loperamide which can be titrated to provide a firmer stool where non-neurogenic bowel causes have been excluded and dietary and other apparoaches have failed to successfully control stool form.

When does diarrhoea need investigating?
Refer urgently if red flag symptoms or signs are present (NHS Evidence Clinical Knowledge Summaries 2011).

- In particular, refer people who meet the following criteria, under 2-week wait rules for suspected colorectal cancer:
  - Symptoms suggestive of colorectal or anal cancer.
  - Aged 40 years or older, reporting rectal bleeding with a change of bowel habit towards looser stools and/or increased stool frequency persisting for 6 weeks or more.
  - Presenting with a right lower abdominal mass consistent with involvement of the large bowel.
  - Presenting with a palpable rectal mass (intraluminal and not pelvic).
  - Aged 60 years or older, with a change in bowel habit to looser stools and/or more frequent stools persisting for 6 weeks or more with or without rectal bleeding.
  - Men of any age with unexplained iron deficiency anaemia and a haemoglobin level of 11 g/100 mL or less.
  - Non-menstruating women with unexplained iron deficiency anaemia and a haemoglobin level of 10 g/100 mL or less.
  - For further information, see the CKS topic on GI (lower) cancer - suspected.

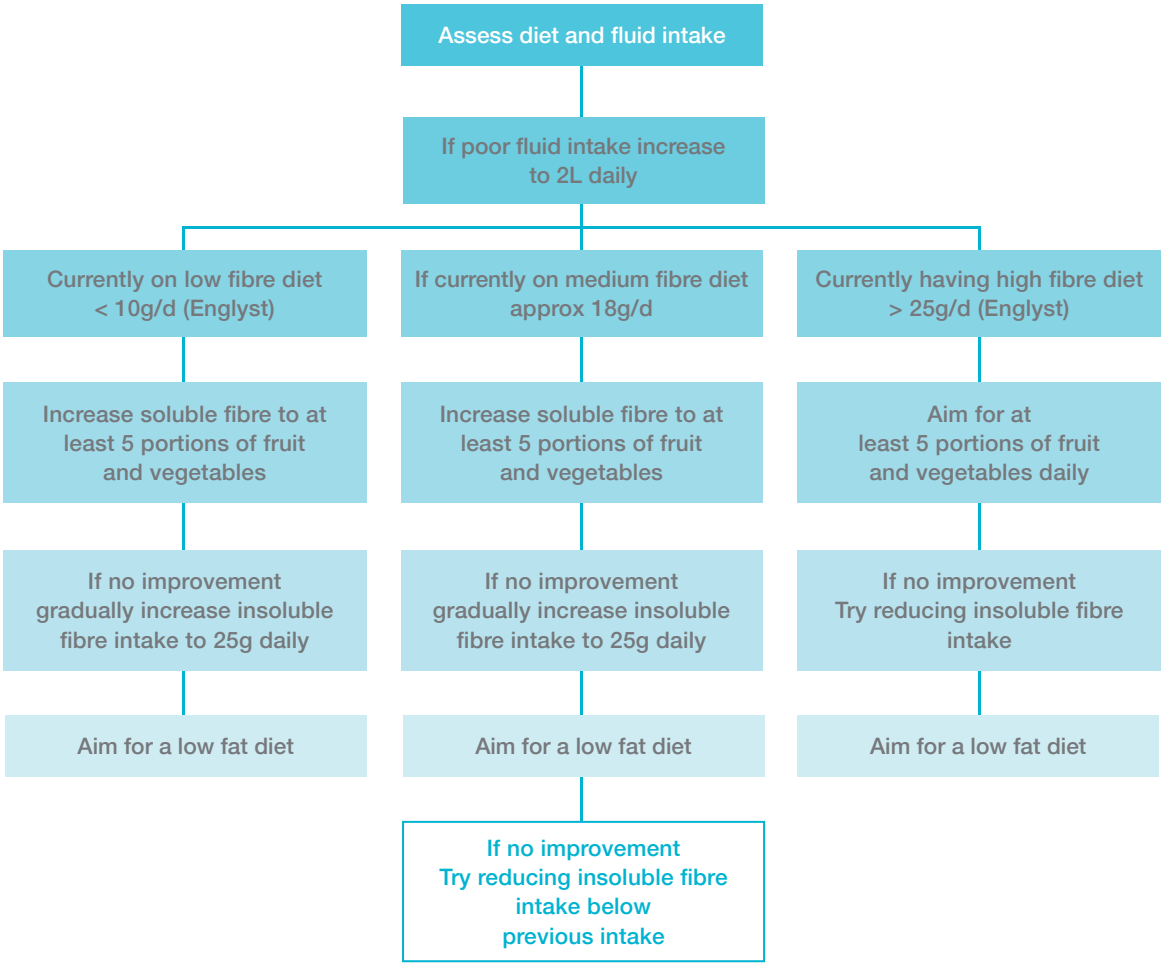
Refer people for further assessment and management if:

- History, examination, and blood test results suggest any of the following:
  - Coeliac disease (see the CKS topic on Coeliac disease).
  - Crohn's disease (see the CKS topic on Crohn's disease).
  - Ulcerative colitis (see the CKS topic on Ulcerative colitis).
  - The diagnosis is uncertain.
  - If the person is 45 years of age or younger, refer for flexible sigmoidoscopy (the diagnostic yield is not different to colonoscopy in this group).
  - If the person is older than 45 years, refer for colonoscopy.

6.2 Stools too hard

- Assess diet for current food and fluid intake – using assessment provided later in this section – **9.11 Fibre intake calculation**.
- Increase fluid intake with water-based fluids such as water, dilute squash, tea, coffee if intake inadequate.
- Encourage at least 5 portions of fruit and vegetables daily.
- If insoluble fibre intake is poor (<10g/d) or medium (approx 18g/d) then a gradual increase should be encouraged along with an adequate fluid intake. Usually not beyond 25g of total fibre.
- If fibre intake is high (>25g/d) or increasing the insoluble intake has not been beneficial, try reducing the insoluble fibre content gradually.
- If all these changes make no difference return to normal diet, encourage as balanced a diet as possible.
- Consider using a stool softener.

Chart 2. Stools too hard



Englyst is the method of calculating fibre content used in the UK. This gives a figure about 30% lower than the AOAC method, which is used by the USA and the rest of Europe.

When should constipation be investigated?
Referral is indicated when (NHS Evidence Clinical Knowledge Summaries 2011).

- Cancer is suspected.
  - o Referral for colonoscopy should be considered in people over 50 years of age if 'red flags' are present.
- An underlying cause is suspected.
  - o If an underlying problem is suspected, consider having the results from blood tests for inflammatory markers, hypothyroidism, hypercalcaemia, and coeliac disease available before the person attends their appointment.
- Pain and bleeding on defecation (e.g. from an anal fissure) is severe or does not respond to treatment for constipation.
  - o Consider surgical referral.
- Treatment is unsuccessful.
  - o Treatment failure may be early, when attempts at relieving faecal loading fail, or late, if there is difficulty maintaining remission.
  - o Management may require further tests (such as blood tests, radiological imaging for bowel studies, or consideration of rectal suction biopsy, or transit studies).
  - o Assessment is required prior to referral for other interventions (such as psychology, psychiatry).
- Faecal incontinence is present.
  - o Referral to Continence Service (if available) may be appropriate for advice and monitoring.
- More detailed support with diet is required.
  - o Consider dietetics referral.

7. Fibre intake calculation

The following chart and information regarding the fibre content of foods may be given to individuals to assess their own fibre intake.

'How Much Fibre Am I Taking?'
Changing your dietary fibre intake may help resolve constipation or loose stools and reduce the need for laxatives and other bowel medication.

Write down below what you ate yesterday (add in or remove foods if yesterday was not a typical day's intake).

Using the table on the following page work out approximately how much fibre you had.

To achieve a high fibre intake, increase your fibre intake **slowly** to 12 to 15 food portions containing 2 gms of fibre each (24-30g) per day.

If you need to reduce your fibre intake then start with the insoluble fibre foods e.g. instead of wholemeal bread take white bread.

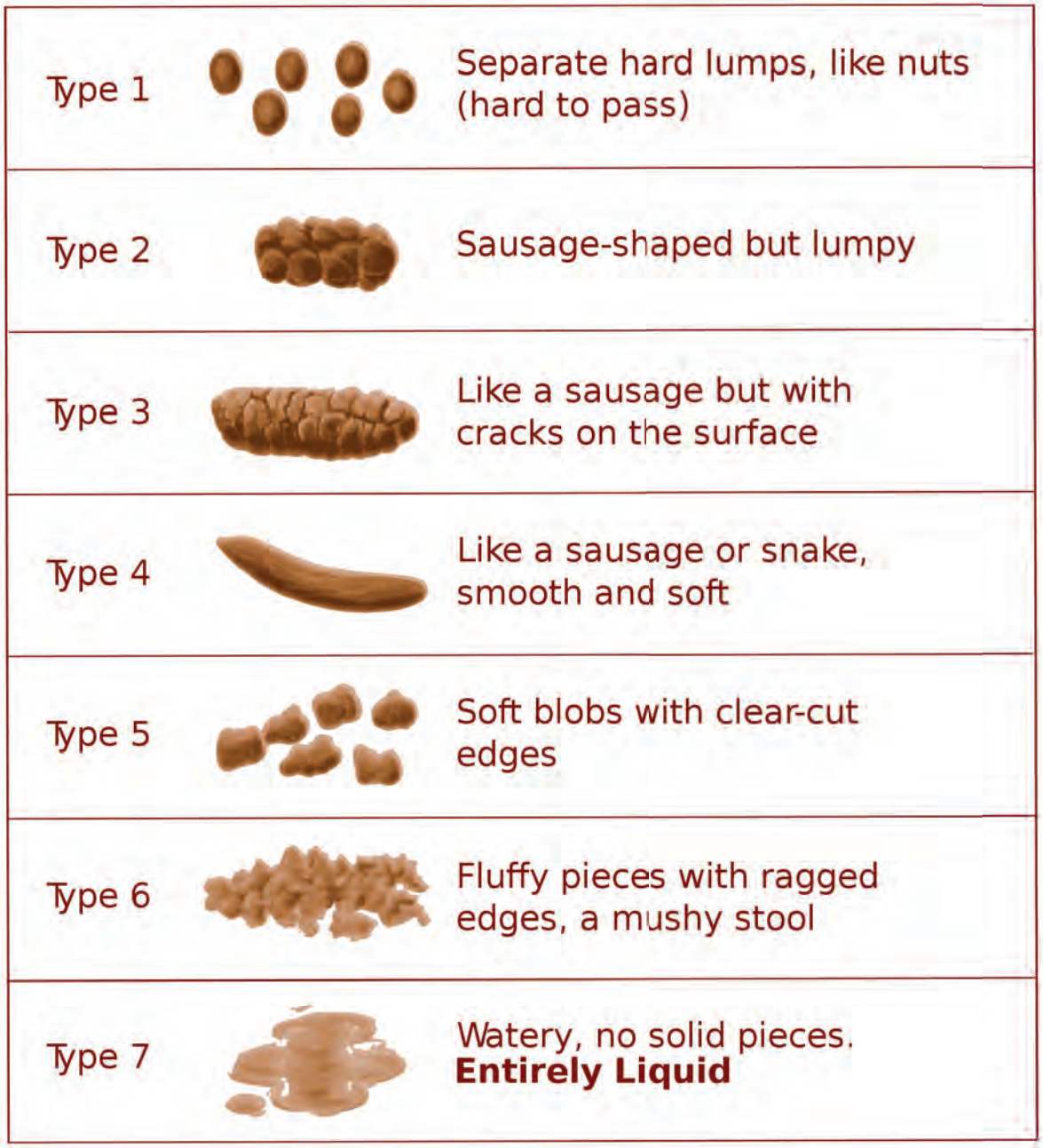
Remember you should also drink plenty of fluid to help the fibre work. Check you are having at least 10 cups of fluids (not including alcohol) per day. This is 2 litres or about 3 ½ pints. Keep a record for a day if you are not sure.

Name of Patient:		Date:
Meal	**Food Intake**	**Fibre intake**
Breakfast		
Mid morning		
Lunch		
Mid afternoon		
Evening		
During evening/ supper		
	Total fibre intake	

Food	Type	Portion required
Bread:	Wholemeal Brown Soft Grain White Wholemeal roll White Roll	1 small slice 1½ slice 1½ slice 2 small slices ½ roll 2 rolls
Breakfast Cereals:	All Bran Branflakes or Museli Cornflakes Porridge Shredded Wheat	1 tablespoon 2 tablespoons 8 tablespoons 1 ladle 1 biscuit
Rice and Pasta:	Brown Rice White Rice Wholemeal Pasta White Pasta	3 tablespoons (cooked) 5 tablespoons (cooked) 2 tablespoons (cooked) 4 tablespoons (cooked)
Miscellaneous:	Wholemeal Scone Plain Scone	1 small 2 small
Soluble Fibre		
Vegetables:	Cabbage, Cauliflower Carrots, Broccoli, Green Beans Parsnip, Turnip Spinach Sweetcorn Potato & Skin Potato without Skin	Large serving (4oz/110g) Med serving (3oz/85g) Small serving (1oz/28g) 2 tablespoons 1 medium (3oz/85g) 3 medium (9oz/250g)
Fresh Fruit:	Apple, Orange, Pear, Peach Banana Grapes Melon Raspberries Strawberries	1 medium 1 small 4oz/110g ½ melon 1oz/28g 6 (3oz/85g)
Dried Fruit:	Apricots Prunes Raisins, Sultanas	4 4 1 tablespoon
Pulses:	Butter, Baked, or Kidney Beans Lentils Peas	1 tablespoon 2 tablespoons (cooked) 3 tablespoons
Nuts:	Peanuts Peanut Butter	1oz/28g 2 tablespoons
Miscellaneous:	Fruit Cake	2oz/57g (small slice)

Appendix 2: Bristol Stool Form Scale

Bristol Stool Chart



The Bristol Stool Scale (Heaton et al 1992)

Appendix 3: Procedure for digital rectal stimulation

- Explain the procedure to the individual (if necessary) and obtain consent. Even if the individual consents to the procedure, if they request you to stop at any time, you must do so. The individual should be invited to have an escort present if they wish.
- Ensure a private environment.
- Observe the individual throughout the procedure for signs of autonomic dysreflexia (see Section 10 – Glossary) or other adverse events (Addison and Smith 2000).
- If not contraindicated (i.e. in unstable spinal cord injuries) position the individual in a lateral position (usually left side) with knees flexed. Flexing the knees promotes the stability of the individual and helps to expose the anus (Campbell 1993). If the spinal injury is unstable bowel management will be conducted during a team log roll, maintaining spinal alignment at all times. This procedure may also be conducted over the toilet/commode by the individual or the carer where no unstable spinal fracture is present.
- Place protective pad under the patient if appropriate.
- Wash hands, put on two pairs of disposable gloves and an apron.
- If the individual suffers local discomfort or symptoms of autonomic dysreflexia during this procedure, local anaesthetic gel may be instilled into the rectum prior to the procedure (Furasawa 2008, Cosman 2005). This requires 5-10 minutes to take effect and lasts up to 90 minutes. Note that long term use should be avoided due to systemic effects (BNF 2008).
- Lubricate gloved finger with water soluble gel.
- Inform individual you are about to begin.
- Insert single gloved, lubricated finger (Addison and Smith 2000) slowly and gently into rectum.
- Turn the finger so that the padded inferior surface is in contact with the bowel wall.
- Rotate the finger in a clockwise direction for at least 10 seconds, maintaining contact with the bowel wall throughout.
- Withdraw the finger and await reflex evacuation.
- Repeat every 5-10 minutes until rectum is empty or reflex activity ceases.
- Remove soiled glove and replace, re-lubricating as necessary between insertions.
- If no reflex activity occurs during the procedure, do not repeat it more than 3 times. Use digital removal of faeces (DRF) if stool is present in the rectum.
- During the procedure the person delivering care may carry out abdominal massage.
- Once the rectum is empty on examination, conduct a final digital check of the rectum after 5 minutes to ensure that evacuation is complete.
- Place faecal matter in an appropriate receptacle as it is removed, and dispose of it and any other waste in a suitable clinical waste bag.
- When the procedure is completed wash and dry the patient's buttocks and anal area and position comfortably before leaving.
- Remove gloves and apron and wash hands.
- Record outcomes using the Bristol Scale (Norgine 1999, Heaton 1993).
- Record and report abnormalities.

Appendix 4: Procedure for digital removal of faeces (on the bed)

- Explain the procedure to the individual (if necessary) and obtain consent. Even if the individual consents to the procedure, if they request you to stop at any time, you must do so. The individual should be invited to have an escort present if they wish.
- Observe the individual throughout the procedure for signs of autonomic dysreflexia or other adverse events (RCN 2000).
- Ensure a private environment.
- If the individual's spinal injury is stable, position the individual in a lateral position (usually left side) with knees flexed. Flexing the knees promotes the stability of the individual and helps to expose the anus (Campbell 1993). If the spinal injury is unstable, bowel management will be conducted during a team roll, maintaining spinal alignment at all times.
- Place protective pad under the individual.
- Wash hands, put on disposable gloves and apron.
- If the individual suffers local discomfort or autonomic dysreflexia during this procedure, local anaesthetic gel may be applied prior to the procedure (Furusawa 2008, Cosman 2005). This requires 5-10 minutes to take effect and lasts up to 90 minutes. Note that long term use should be avoided due to systemic effects (BNF 2008).
- Lubricate gloved finger with water soluble gel.
- Inform individual you are about to begin.
- Insert single gloved, lubricated finger (Addison and Smith 2000) slowly and gently into rectum.
- If stool is a solid mass, push finger into centre, split it and remove small sections until none remain. If stool is in small separate hard lumps remove a lump at a time. Great care should be taken to remove stool in such a way as to avoid damage to the rectal mucosa and anal sphincters i.e. do not over-stretch the sphincters by using a hooked finger to remove large pieces of hard stool which may also graze the mucosa. Using a hooked finger can lead to scratching or scoring of the mucosa and should be avoided. Where stool is hard, impacted and difficult to remove other approaches should be employed in combination with digital removal of faeces. If the rectum is full of soft stool continuous gentle circling of the finger may be used to remove stool: this is still digital removal of faeces.
- During the procedure the person delivering care may carry out abdominal massage.
- Once the rectum is empty on examination, conduct a final digital check of the rectum after 5 minutes to ensure that evacuation is complete.
- Place faecal matter in an appropriate receptacle as it is removed, and dispose of it in a suitable clinical waste bag.
- When the procedure is completed wash and dry the individual's buttocks and anal area and position comfortably before leaving.
- Remove gloves and apron and wash hands.
- Record outcome using the Bristol Scale (Norgine 1999, Heaton 1993).
- Record and report abnormalities.

Appendix 5: Resources

Professional Organisations

Association for Continence Advice
www.aca.uk.com/

Multidisciplinary Association of Spinal Cord Injury Professionals (MASCIP)
www.mascip.co.uk/Home.aspx

Service User Organisations

Bladder and Bowel Foundation
www.bladderandbowelfoundation.org

Beating Bowel Cancer
www.beatingbowelcancer.org or
patients@beatingbowelcancer.org

Chest Heart and Stroke Scotland
www.chss.org.uk

Multiple Sclerosis Society
www.mssociety.org.uk/

Multiple Sclerosis Trust
www.mstrust.org.uk/

Parkinson's UK
www.parkinsons.org.uk/

Spinal Injuries Association
www.spinal.co.uk/

Stroke Association
www.stroke.org.uk/

Spinal Cord Injury Centres UK and Ireland

Belfast Spinal Cord Injuries Unit
Musgrave Park Hospital, Stockman's Lane,
Balmoral, Belfast BT9 7JB
028 9066 9501
www.belfasttrust.hscni.net
info@belfasttrust.hscni.net

The Duke of Cornwall Spinal Treatment Centre
Salisbury District Hospital, Odstock Road,
Salisbury SP2 8BJ
01722 429291
01722 336262 bleep 1170
www.spinalinjurycentre.org.uk

The International Spinal Injuries and Rehabilitation Centre
Royal Buckinghamshire Hospital, Buckingham Road, Aylesbury, Buckinghamshire HP19 3AB
(private healthcare facility)
01296 678800
www.royalbucks.co.uk/

Golden Jubilee Spinal Injuries Centre
James Cook University Hospital, Marton Road,
Middlesbrough TS4 3BW
Reception 01642 283644
Acute Ward 01642 282641
Rehabilitation Ward 01642 282645
www.southtees.nhs.uk/live/

The London Spinal Injuries Centre
Royal National Orthopaedic Hospital,
Brockley Hill, Stanmore HA7 4LP
020 8954 2300
www.rnoh.nhs.uk

The Midland Centre for Spinal Injuries
The Robert Jones & Agnes Hunt Orthopaedic Hospital, Oswestry, Shropshire SY10 7AG
Reception 01691 404655
Liaison staff – 01691 404109/404655
www.rjah.nhs.uk

National Rehabilitation Hospital
Rochestown Avenue, Dun Laoghaire,
Dublin, Ireland
00 353 2355214
00 353 2355000 bleep 8017
www.nrh.ie/

The National Spinal Injuries Centre,
Stoke Mandeville Hospital, Mandeville Road,
Aylesbury, Buckinghamshire HP21 8AL
Tel: 01296 315818
www.spinal.org.uk

Princess Royal Spinal Injuries and Neurorehabilitation Centre
Northern General Hospital, Osborne Building,
Herries Road, Sheffield S5 7AU
Reception 0114 2715644
Acute Ward 0114 2715608
Rehabilitation Ward 0114 2715636
www.sth.nhs.uk
(then search for Northern General Hospital)

Queen Elizabeth Spinal Injuries Centre
Southern General Hospital, 1345 Govan Road,
Glasgow G51 4TF
0141 201 2555
www.spinalunit.scot.nhs.uk
Email: spinalunit@sgh.scot.nhs.uk

Welsh Spinal Injuries and Neurological Rehabilitation Centre
Rookwood Hospital, Fairwater Road,
Llandaff, Cardiff CF5 2YN
Reception 029 2041 5415
Ward 5 – 029 2031 3833
www.cardiffandvale.wales.nhs.uk

The Regional Spinal Injuries Centre
Southport and Formby General Hospital,
Town Lane, Kew, Southport PR8 6NJ
01704 547471
www.southportandormskirk.nhs.uk/spinal.asp

Yorkshire Regional Spinal Centre
Pinderfields General Hospital, Aberford Road,
Wakefield WF1 4DG
Reception 01924 201688
Medical Secretary 01924 212273
Liaison staff 01924 212056
www.midyorks.nhs.uk

Notes

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Ostomy Care
Urology & Continence Care
Wound & Skin Care

Coloplast

Coloplast develops products and services that make life easier for people with very personal and private medical conditions. Working closely with the people who use our products, we create solutions that are sensitive to their special needs. We call this intimate healthcare. Our business includes ostomy care, urology and continence care and wound and skin care. We operate globally and employ more than 7,000 people.

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3050 Humlebæk
Denmark

www.coloplast.com