

# Spinal Cord Injury Neurogenic Bowel

Rebecca Charbonneau MD FRCPC, SCI Medicine

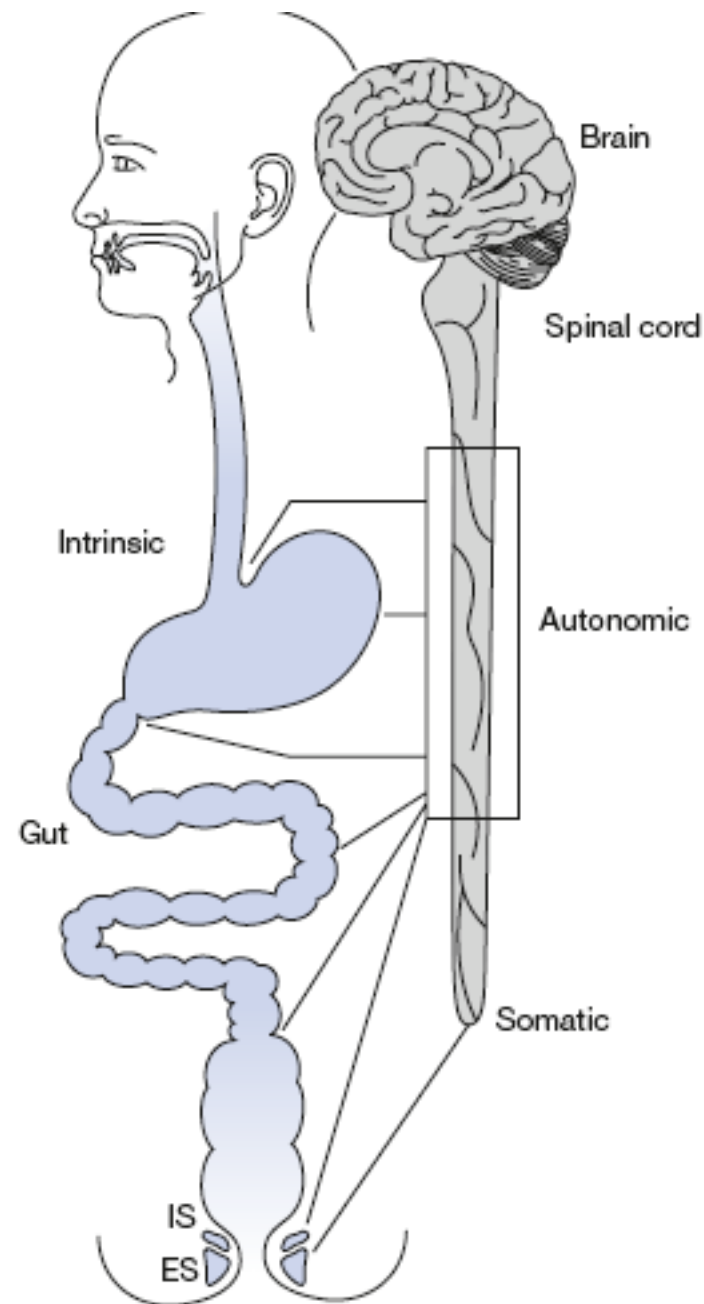
Raj Parmar MN, FAA-NP

Terry Tenove SCIA

# Definition

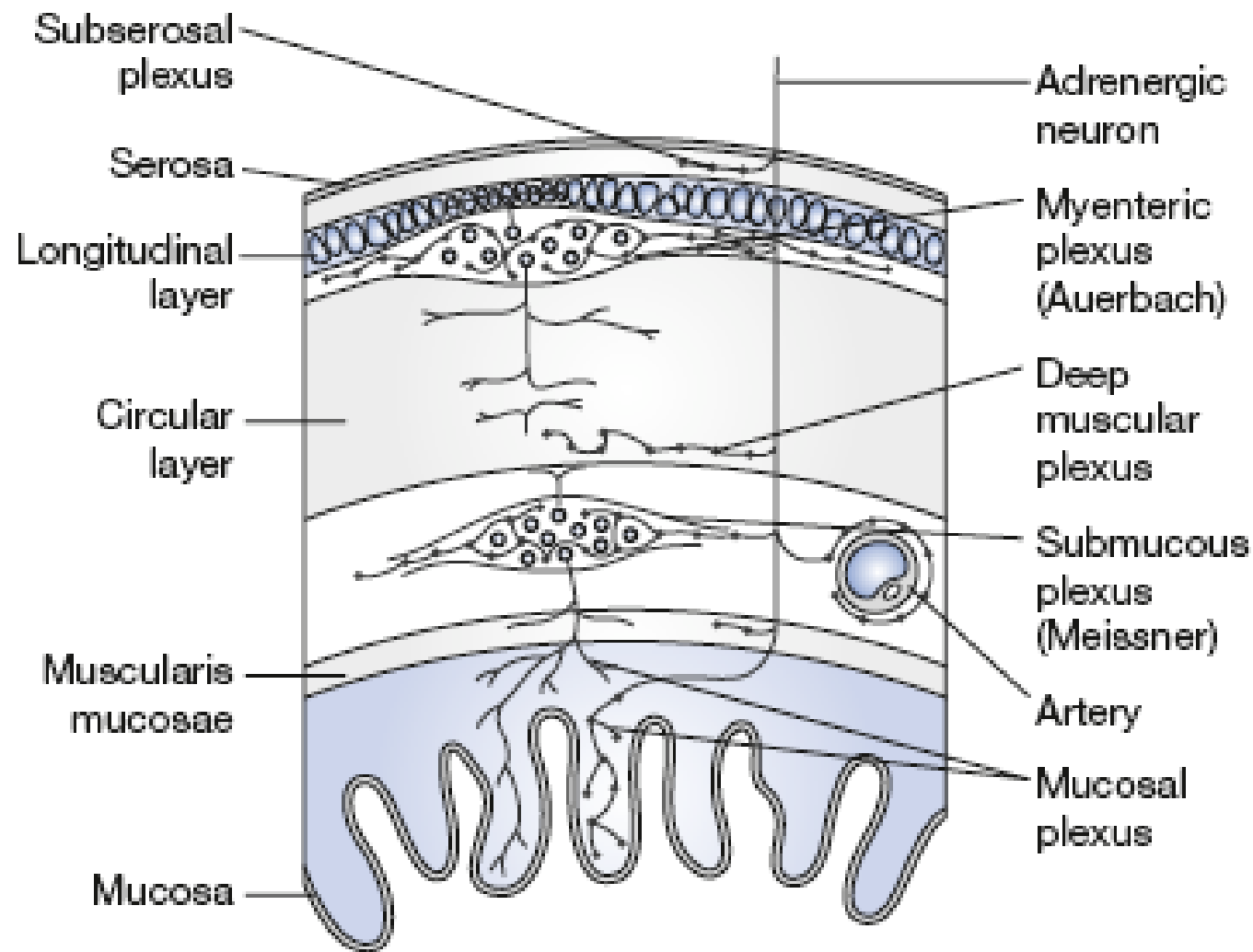
- ▶ **Neurogenic bowel (NB)** is the impairment of the gastrointestinal and anorectal function from a lesion in the nervous system, resulting in failure to evacuate the bowel (fecal constipation, fecal impaction) or failure to contain stool (fecal incontinence).

# Anatomy



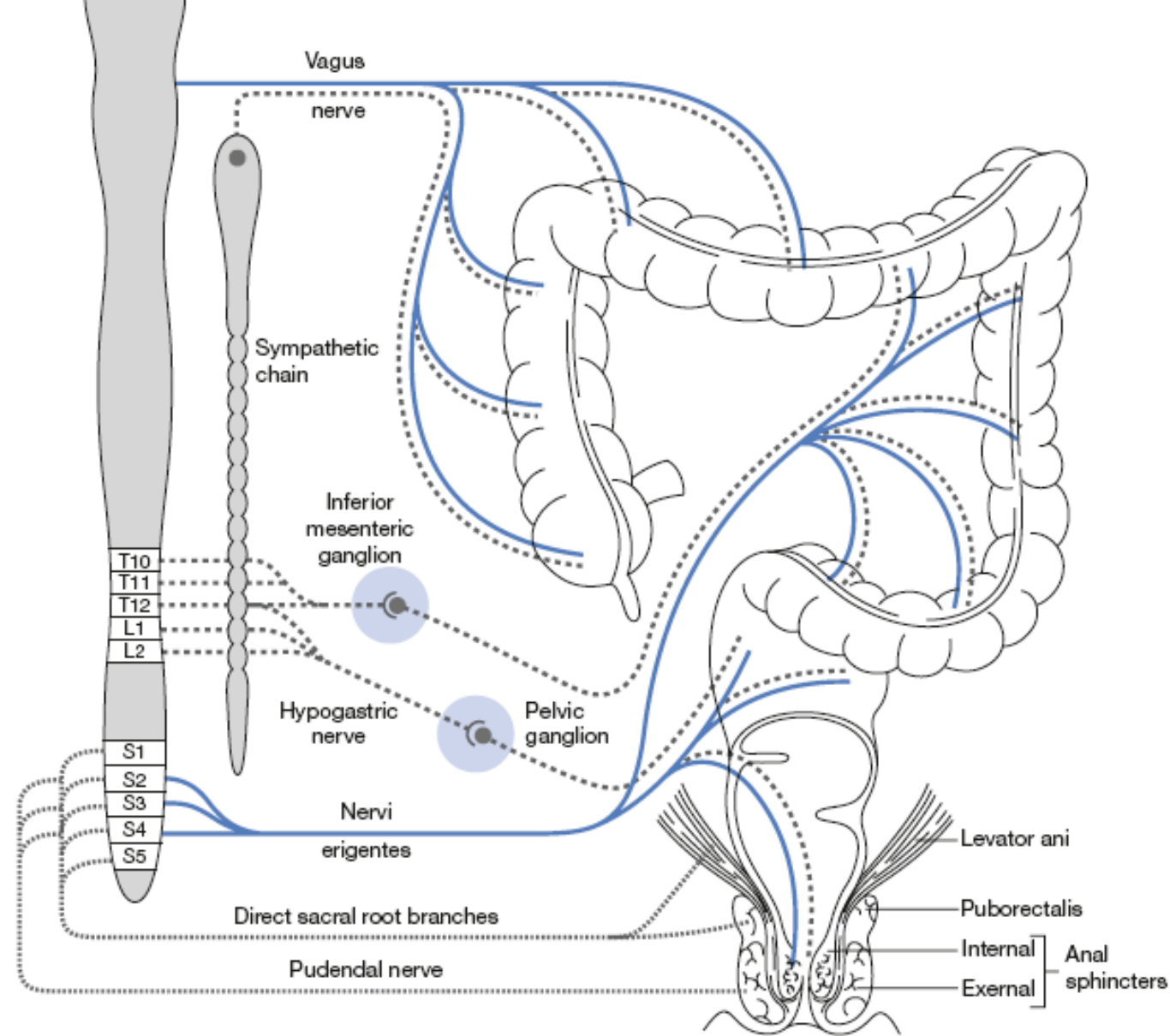
**FIGURE 29-1** The bowel has three nervous systems: somatic, autonomic, and enteric. ES, External sphincter; IS, internal sphincter.

Braddom, R. L. (1996). Physical medicine & rehabilitation. Philadelphia: Saunders.

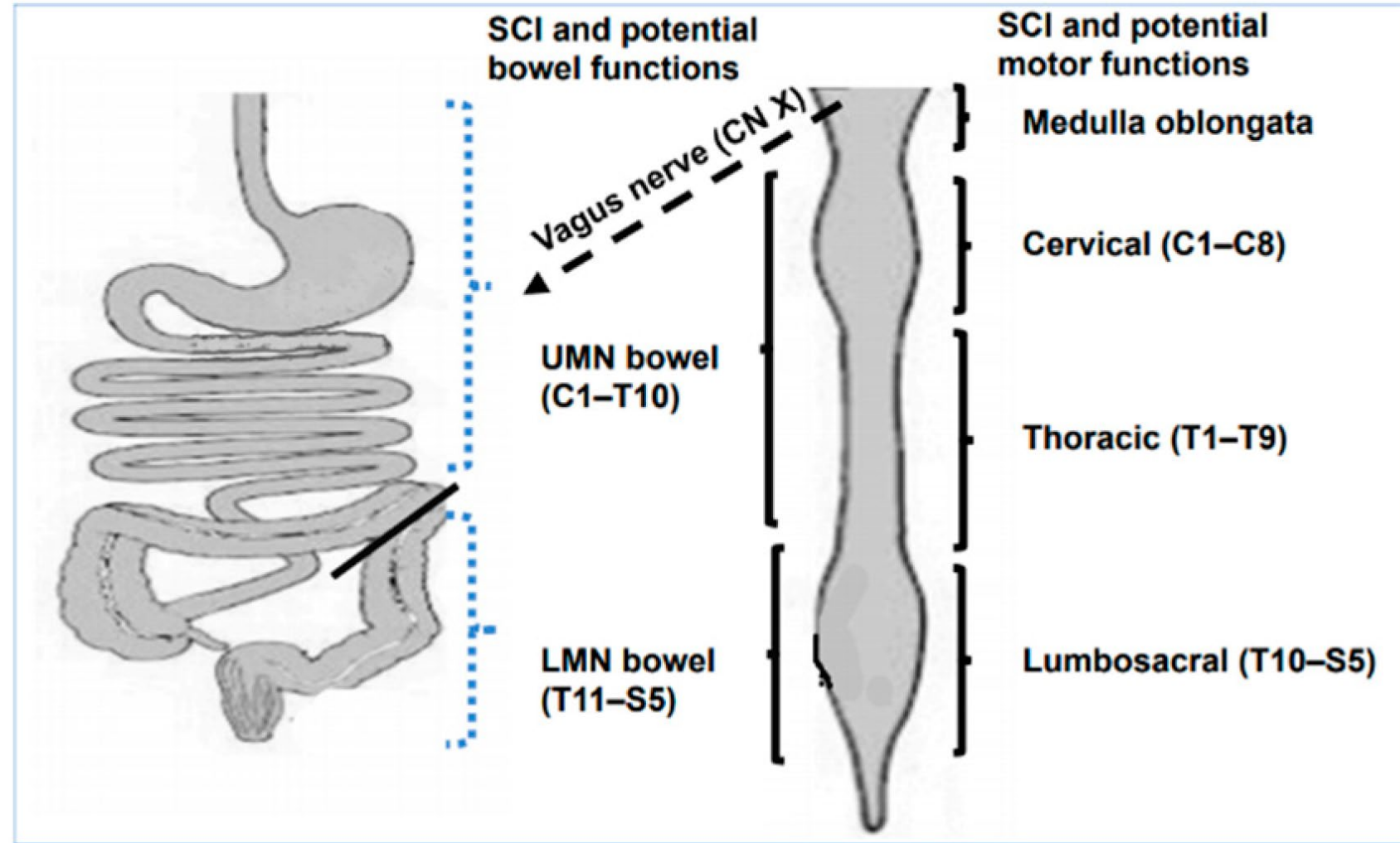
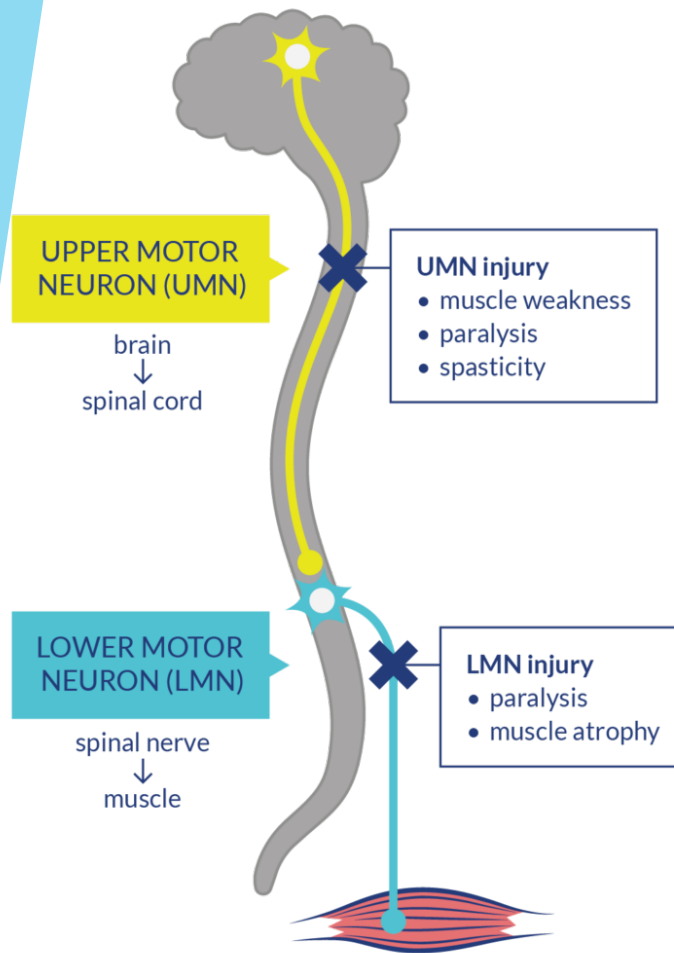


**FIGURE 29-3** A transverse section of the gut, showing the enteric plexus and the distribution of adrenergic neurons. Note the ganglionic plexuses of Auerbach and Meissner. The deep muscular plexus contains a few ganglia, the subserosal contains an occasional ganglion, and the mucosal plexus shows none. The adrenergic fibers are all extrinsic and arise from the prevertebral sympathetic ganglia. The adrenergic fibers are distributed largely to the mesenteric, submucous, and mucosal plexus and to blood vessels. (From Goyal RK, Crist, JR: *Neurogastroenterology and Gastroenteric Neurophysiology*. Philadelphia: Saunders, 1999.)

Braddom, R. L. (1996).  
Physical medicine &  
rehabilitation. Philadelphia:  
Saunders.



**FIGURE 29-2** Neurologic levels and pathways for the sympathetic, parasympathetic, and somatic nervous system innervation of the colon and anorectum. Not shown is the enteric nervous system, which travels along the bowel wall from esophagus to internal anal sphincter and forms the final common pathway to control the bowel wall smooth muscle.



# UMN vs LMN bowel routines

# Colonic Reflexes

1. **Gastrocolic Reflex:**

Increased colonic activity after a meal.

2. **Recto-colic reflex**

Causes colonic peristalsis in response to mechanical or chemical stimulation of the rectum or anus

# Colonic Transit time after spinal cord injury

Leduc (Montreal 1997 in Journal of SCM)

- ▶ Non SCI: n=96 Total CTT = 31 hours
- ▶ SCI: n=30 Total CTT = 86 hours

# Bowel Care

Individually developed and prescribed procedure for defecation that is carried out by the patient or attendant



Goal: Social continence

Predictable

Scheduled

Adequate defecations  
without incontinence at  
other times

# UMN Bowel

May result in:

1. Overactive segmental peristalsis
2. Underactive propulsive peristalsis
3. Spastic EAS constriction

Characterized by slow colonic propulsion and a competent external anal sphincter (EAS), which favors stool retention and fecal distension of the colon.

# UMN Bowel

## History

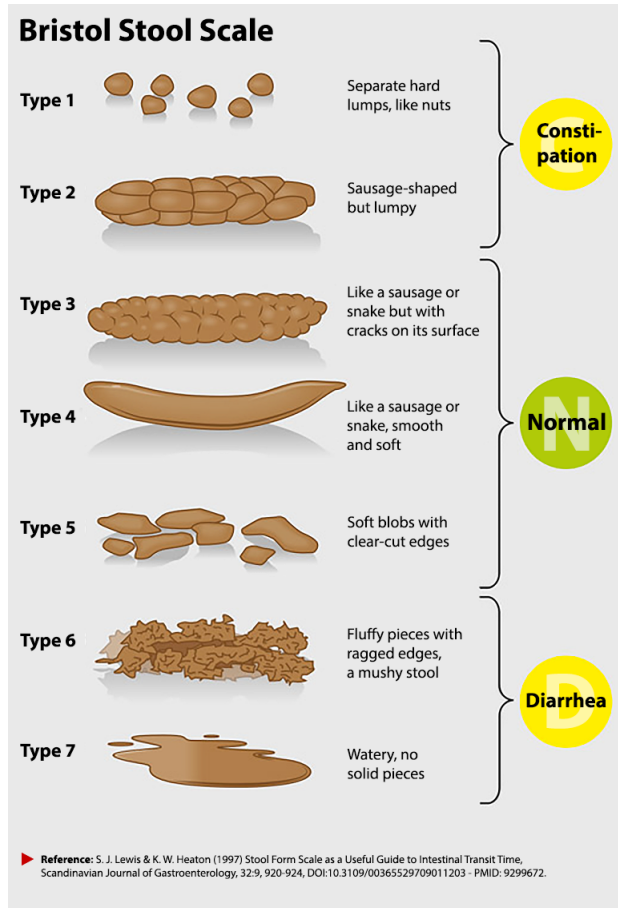
- ▶ Delayed evacuation with fecal incontinence
- ▶ Early satiety or loss of appetite
- ▶ Nausea
- ▶ Respiratory compromise if severe abdominal distention

## Exam

- ▶ Present anocutaneous reflex and bulbocavernosus reflex
- ▶ Increased EAS tone on digital rectal exam

## Treatment Goal

- ▶ Maintain soft-formed stool evacuated in a timely, predictable fashion.
- ▶ With a bowel routine performed every 1 to 2 days



# Bristol Stool Chart

# UMN Bowel Treatment

## Medical

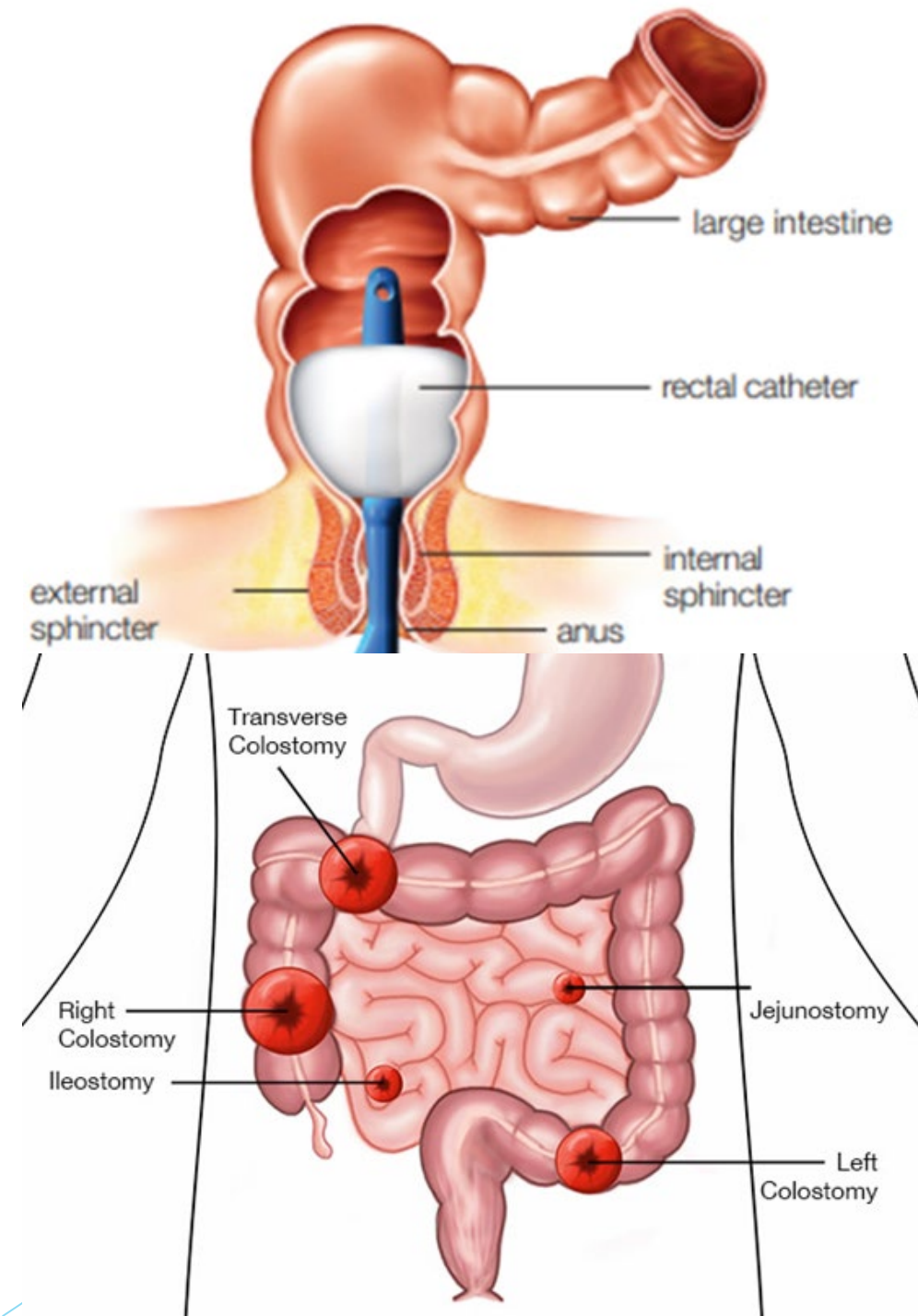
- ▶ Bowel care is performed at the same time of the day
- ▶ Water-soluble lubricant
- ▶ Colonic stimulant (eg, senna, polyethylene glycol)
- ▶ Methods of stimulated evacuation include digital stimulation, suppositories, and mini- enemas

## Modalities

- ▶ Transanal irrigation

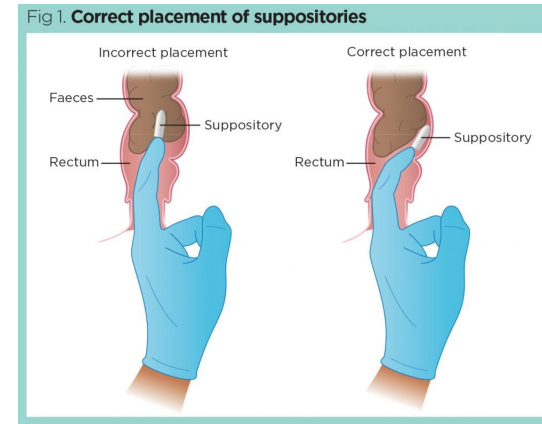
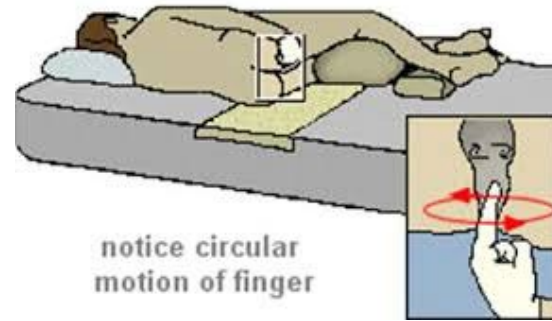
## Surgical

- ▶ Malone antegrade continence enema (MACE)
- ▶ Colostomy for failure of other bowel management options



# Bowel Essentials

- ▶ Patients and care givers will need education regarding correct bowel routine techniques
- ▶ Allied health inform what durable medical equipment will work (variety of options for padded commodes etc)
- ▶ OT and RN work with patients to increase independence, may include suppository insertor etc



# Pharmacologic Treatment

## **Bulk Forming Agents:**

- **Drugs:** Psyllium (Metamucil),

## **Prokinetic Agents (peristalsis stimulants)**

- **Drugs:** Senna (Senokot), Bisacodyl (Dulcolax) Prucalopride

# Pharmacologic Treatment

## Osmotic

- ▶ **Drugs:** PEG (Miralax), Magnesium Citrate,

## Stimulant & Osmotic

- ▶ **Drugs:** Bisacodyl (Dulcolax, Magic Bullet), Mini-Enema (Enemeez)

# Areflexic or Lower motor neuron bowel

- ▶ Results from damage to parasympathetic cell bodies at the conus medullaris, their axons in the cauda equina or the peripheral nerves.
- ▶ No spinal cord mediated reflex defecation occurs
- ▶ No spinal cord mediated peristalsis occurs
- ▶ Stool propulsion only via the myenteric plexus
- ▶ EAS is denervated, increasing risk for incontinence
- ▶ Levator ani muscles lack tone = Decreasing rectal angle
- ▶ Produces scybalous stool

# LMN Bowel

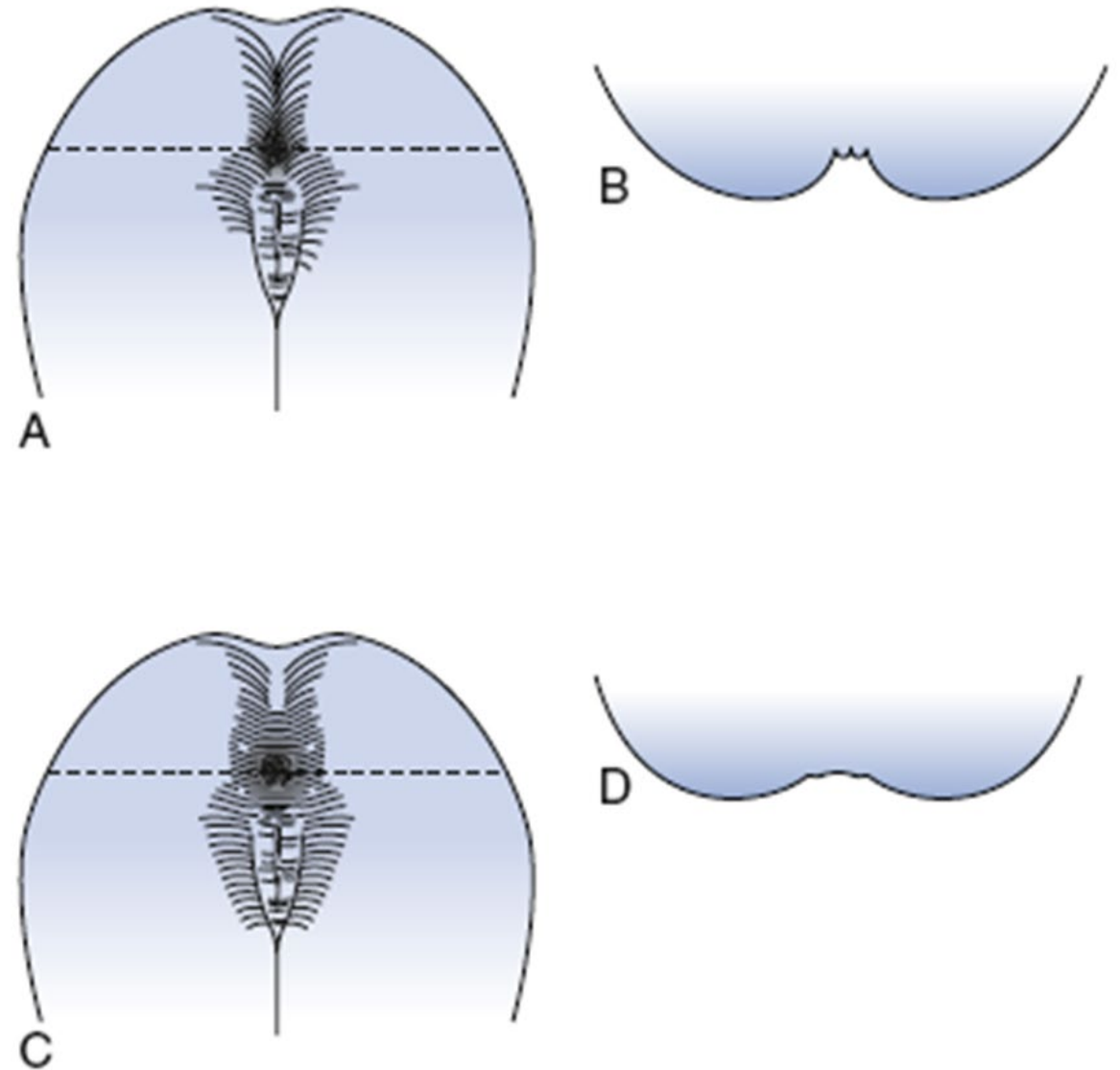
## HPI:

- Fecal incontinence with increased abdominal pressure

## Exam:

- Lower extremity sensory motor impairment with diminished deep tendon reflexes
- Reflex Abdominal tenderness and tympani
- Reduced or absent tone in EAS on rectal exam
- Absent anocutaneous and bulbocavernosus reflex

# Examination for LMN



**FIGURE 29-5** Upper motor neurogenic bowel presents an appearance similar to normal (A, rear view; B, profile from above). Anal contour of the lower motor neurogenic bowel (C, rear view; D, profile from above), with its atrophic external anal sphincter, shows a flattened, scalloped-appearing anal area.

# LMN Bowel: Treatment

**Treatment Goal:** Obtain firm, formed stool that can be retained between bowel routines. QD or BID bowel routine.

## Medical

- ▶ Water-soluble lubricant
- ▶ Bulk laxatives (fiber and metamucil) as needed to produce well-formed stool
- ▶ Postprandial bowel care to take advantage of the gastrocolic reflex
- ▶ Abdominal massage
- ▶ Digital manual stool removal is an effective means of evacuation
- ▶ Drink adequate fluids: 40 ml per kg body weight plus 500 ml, or at least 1.5 liters per day.
  - ▶ Balance with fluid restriction if doing intermittent catheterization

## Surgical

- ▶ Colostomy may be considered if unable to achieve satisfactory results by other means.

# LMN Bowel: Complications of treatment

From digital manipulation and straining

- ▶ Hemorrhoids
- ▶ Perirectal abscess
- ▶ Rectal ulcers
- ▶ Perirectal fissure
- ▶ Rectal prolapse

# Summary

| UMN                                                                 | LMN                                                                       |
|---------------------------------------------------------------------|---------------------------------------------------------------------------|
| Constipation and fecal retention                                    | Constipation and incontinence                                             |
| Anal area appears normal.                                           | Flattened scalloped appearance of anal area                               |
| Normal or increase anal sphincter tone                              | Reduced anal sphincter tone                                               |
| Reflex defecation is present.                                       | Absent reflex defecation                                                  |
| Anocutaneous and bulbocavernosus reflexes are present or increased. | Anocutaneous and bulbocavernosus reflexes are absent or decreased.        |
| Target stool consistency is soft formed.                            | Target stool consistency is firm but not hard.                            |
|                                                                     | Prone to rectal prolapse                                                  |
| Bowel care every 1-3 days is recommended.                           | Daily bowel care is recommended to avoid fecal incontinence.              |
| Use rectal suppositories to promote peristalsis and evacuation.     | Rectal suppositories are not usually effective.                           |
| Digital stimulation can be used to assist in evacuation.            | Digital stimulation is not effective; manual evacuation may be necessary. |

# TAKE HOME MESSAGE

## ▶ UMN

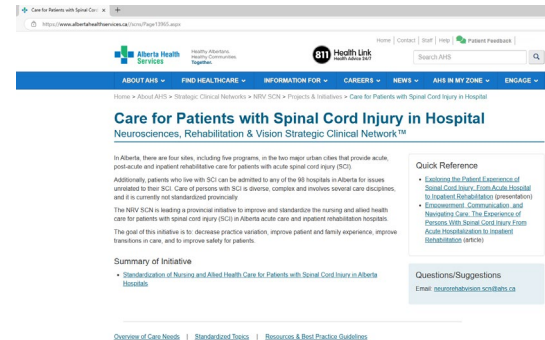
- ▶ Senna 2 tabs PO qNoon; 8 hours prior to suppository/routine
  - ▶ Could titrate from 1-4 tabs
- ▶ **Fast-acting Bisacodyl suppository 10 mg PR daily at 2000h**
  - ▶ Manually disimpact first if stool there!
  - ▶ **Digital stimulation q5-15minutes X3**
- ▶ PEG 3350 17 g PO daily PRN - titrate to firm consistency stool

## ▶ LMN

- ▶ Daily to BID **manual disimpaction**
- ▶ Metamucil

# Resources

- ▶ AHS
  - ▶ “Care for persons with SCI”
- ▶ Spinal Cord Essentials
- ▶ PVA guideline
- ▶ Queensland (Aus.)



## CLINICAL PRACTICE GUIDELINES: SPINAL CORD MEDICINE

### Management of Neurogenic Bowel Dysfunction in Adults after Spinal Cord Injury

#### Summary of Recommendations



### Suppository Use After Spinal Cord Injury



After a spinal cord injury, your bowels may not work as they used to. Your Doctor has prescribed a suppository as part of your bowel routine (going poo). A suppository is a medication that works by tightening the muscles in your bowels to move the stool (poo) out of your body. You can have a bowel movement within an hour of using this medication.

Your Doctor will order a suppository for you called **Dulcolax**. For some people this medication may not work very well. If Dulcolax does not work, your doctor will order the Magic Bullet. **Magic Bullet** works faster than **Dulcolax** because it melts faster. It has the same medication.

Queensland  
Spinal  
Cord  
Injuries  
Service

## Fact Sheet

**Managing your Bowels after Spinal Cord Injury**  
A Guide to Lower Motor Neuron Bowels

**SPINAL INJURIES UNIT**  
Ph: 3176 2215  
Fax: 3176 7462

**OUTPATIENT DEPARTMENT**  
Ph: 3176 2641  
Fax: 3176 5664

**Postal and Location**  
Prince of Alexandra Hospital  
Ipswich Rd  
Brisbane QLD 4102  
AUSTRALIA

**TRANSITIONAL REHABILITATION PROGRAM**  
Ph: 3176 9508  
Fax: 3176 9514

**Email**  
lsp@health.qld.gov.au

**Postal**  
PO Box 6053  
Brisbane QLD 4102

**Location**  
3rd Floor, Buranda Village  
Cnr Cornwell St & Ipswich Rd  
Brisbane QLD 4102  
AUSTRALIA

**SPINAL OUTREACH TEAM**  
Ph: 3176 9507

**Spinal Cord Injury and Bowel Function**

The main changes to bowel function after spinal cord injury occur in the lower section of the digestive tract – the large intestine, rectum and anus. To understand the effect of these changes, you must first understand their roles in elimination.

**Large Intestine**

- responsible for absorption of water from the faecal mass for use in all our bodily cells and functions
- propels the waste through the large intestine in wave like contractions of muscle towards the rectum for evacuation

**Rectum**

- holds the faecal bulk ready for evacuation

**Anus**

- controls the release of faeces during defaecation



**Thank You**