Der Balgrist

Spinal Cord Injury Center
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Intestinal Rehabilitation
Bowel Management

The basics of intestinal rehabilitation with paraplegia and the most common complications
for nurses and interested patients

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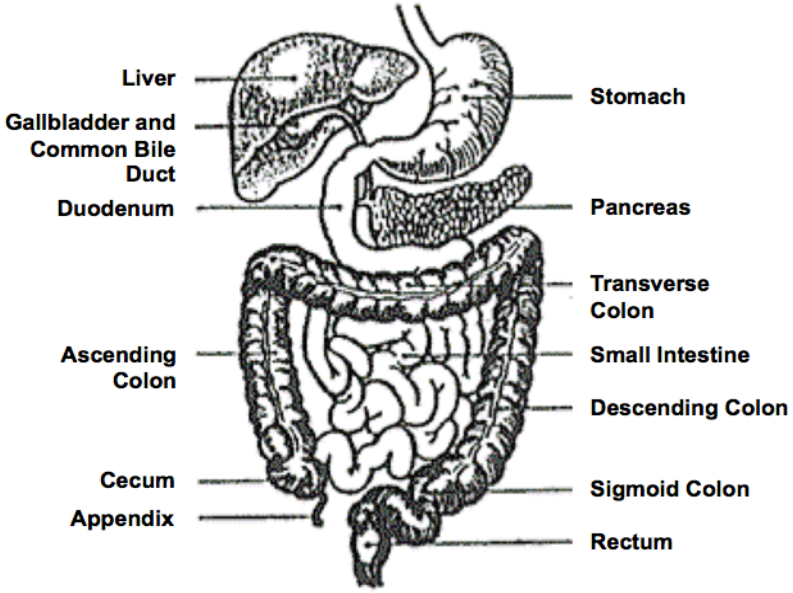
1. Healthy bowel function / continent intestine:

Stool continence is ensured by a permanent contraction of the voluntarily innervated smooth inner and striated outer muscles of the anal sphincter.



The filling of the stool in the rectum causes a dilation of the intestinal wall and amplification of peristalsis occurs through ascending impulses in the plexus myentericus of the intestinal wall, which transports the content of the intestine further toward the anus. As soon as peristalsis reaches the anus the inner sphincter becomes limp. Additionally, a significant increase of peristalsis is achieved by the stimulation of the nerve fibres in the rectum via the sacral cord and parasympathetic fibres. Furthermore, impulses conducted along the spinal cord cause an increase in tension and in intra-abdominal pressure. A voluntary relaxation of the external anal sphincter, the musculature of the pelvic floor and possible additional abdominal pressure finally set off the evacuation of the stool.

2. Bowel function after spinal cord injury:

Damage to the spinal cord has an overall influence on the bowel function regarding the ability to control stool continence.

In the case of spinal cord injury above the sacral cord the defecation reflex is preserved. The urge is either strongly reduced or eliminated. Since the state of tension of the smooth internal sphincter is gone, the emptying of the lower bowel is automatic and uncontrolled.

In the case of *upper motor neuron paralysis* (i.e., above Th11) the state of tension of the smooth internal sphincter is significantly increased to a spastic level. In the case of *lower*

motor neuron paralysis (i.e., below L1) the sphincter muscle is limp, which indicates constant dilation.

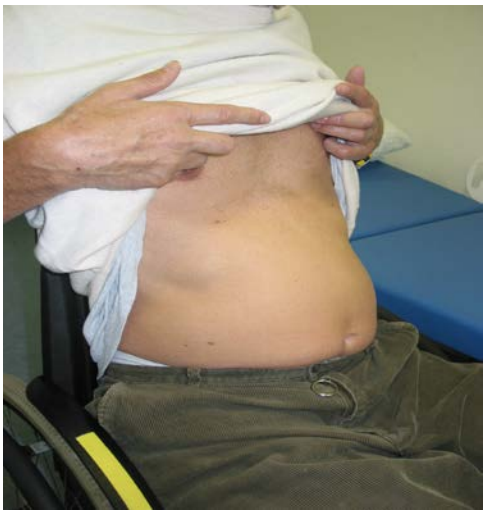
3. Complications

3.1. Obstipation:

Obstipation (constipation) can occur for various reasons:

- Irregular or non-existent stool scheme
- Chronicle incomplete stool evacuation
- Irregular eating habits
- Decrease in fluid intake or increase in fluid deficit
- Changes in daily routine
- Intake of drugs which reduce intestinal activity
- Lack of physical activity

Occasionally, this is also intentionally caused by patients' fears of unpleasant incidents.



The consequences are flatulence, pain, discomfort, unwanted leakage of stool and possible increased spasticity, and/or a disturbance of the reflexive function of the bladder. Especially in quadriplegics, a loss of appetite and breathing problems (shortness of breath) may additionally appear.

Therapy:
Depending on the examination and additional diagnostic procedures (X-ray) done by the physician, stronger purgatives (e.g. X-Prep®, Fordtran) are prescribed. During the laxative procedure blood circulation in patients and especially quadriplegics should be closely monitored because of the possibility of electrolyte losses. Afterward the current diet and respectively the concept of defecation must be inspected and possibly modified.

In recurrent or chronic obstipation, particularly for quadriplegics, Colon Hydrotherapy (colonic irrigation) serves as an elegant, regular and as-needed gentle therapy. Concurrently, a change in nutrition to a fibre-enriched diet is indicated (*see information sheet).*

3.2. Flatulence (meteorism):

This occurs most often in connection with obstipation or excessive intake of flatulent foods, especially carbonated beverages.

Therapy:
In addition to an inspection of the diet- and defecation concept, medicinally supported purging may be indicated.

Preventatively, a thorough bowel massage should be regularly performed during defecation (*see below*).
Experience shows that further along treatment, tea preparations with anise, fennel and cumin or an equivalent intake in tablet form (Flatulex®) are helpful. As a promising alternative we are currently using Imogas forte® on a trial basis.

3.3. Diarrhoea (diarrhoea / paradoxical diarrhoea):

A diarrhoeal episode (more than 3 unformed, watery-pulpy stools per day) with consequent stool incontinence for paraplegics always results in a socially unacceptable condition; in many cases, especially for quadriplegics, it is a rather dangerous situation. – A circulatory collapse can quickly occur due to the high loss of fluid if not enough fluid is supplied. Consequently, close monitoring by nursing staff is required.
Diarrhoea that lasts for several days must be evaluated by a physician to determine the cause and to be treated accordingly.

Paradoxical diarrhoea is a special type of diarrhoea. Repeated incomplete defecation leads to a progressive backlog of faecal masses in the large intestine.
The stool is thickened and increasingly hardened by the loss of fluid. This leads to local irritation of the intestinal wall with strong intestinal juice secretion. As a result, the increased intestinal peristalsis spasmodically presses inviscid, foul-smelling stool over the hard faecal masses of the heavily congested rectum. - Smaller amounts lead to constant disposal (faecal smearing); larger amounts lead to reflexive, uncontrolled evacuations of pulp- to mucous-like material.
Without knowledge of the causes, paradoxical diarrhoea may be incorrectly diagnosed and treated as banal diarrhoea, which aggravates the situation.
X-rays are necessary to accurately diagnose paradoxical diarrhoea.
With regard to therapy, the patient's bowels must be intensively purged (but under no circumstances with Imodium®!).

3.4. Blood loss:

Occasionally, patients report frightening incidences of blood loss from the colon. Most cases are due to small mucosal lesions (fissures) which arise from careless manipulation during manual removal or more rarely due to pinched haemorrhoids. Mucosal lesions can be avoided by the use of sufficient lubrication, latex gloves (thin plastic gloves with rough seams mean risk of injury!) and a gentle approach during manual removal.

In the case of repeated blood loss, the cause should be further clarified by a physician.

4. Practical application of intestinal rehabilitation:

Objectives of rehabilitation:

- Achievement of a regular, balanced bowel function and defecation
- Avoidance of constipation and diarrhoea
- Defecation daily or every other day and at the same time of the day
- If necessary, the patient is able to independently insert a suppository
- The patient is familiar with the purgatives and their effects
- The patient understands the impact of food on the consistency of stool
- The patient can independently clean him-/herself after defecation:
  - In bed
  - In the shower chair
  - On the toilet
- The patient can assess his/her defecation (colour, consistency, quantity)

4.1. Defecation in spinal shock:

In the acute phase of spinal cord injury with spinal shock, transient ileus (intestinal obstruction) may occur, which requires the use of parasympathomimetics (e.g. Prostigmin® or Bepanthen® infusions).

Defecation is carried out through regular manual removal.
Subsequently, the peristalsis and the intestinal activity will (at least in part) recover again.

4.2. Practical approach after the acute phase:

1. Prontolax® supp. daily + oral laxatives (e.g. Movicol® 1 – 2 sachets in the evening).

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2. Bowel function well adjusted: possible change to Lecicarbon® supp.

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3. Stability in bowel function: determine days for bowel emptying to a daily or every other day basis.

Oral intake of laxatives (e.g. Movicol®, Feigensirup® etc.) or bulking- and fibre agents (e.g. Mucilar® Avena, wheat bran, etc.) must be adjusted for each individual patient.

- Not every patient reacts in the same way to an individual substance!!
- Pay attention to the retardation in time until the effect takes place (12 hours to several days)!!

Purgatives are taken each night before the desired defecation. With good response during further course an initially higher dose can be slightly reduced.

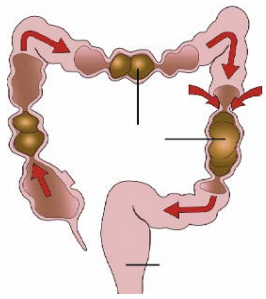
4.2.1. Intestinal training:

Through intestinal training the voluntary control of defecation through the urge for emptying the bowels will be replaced by a fixed, **precise schedule** (1 – 2 daily defecations; at the same time(s) each day, ideally after a main meal). By consistently following the schedule, regular emptying of the bowels can be "trained." Any change in the established program with respect to diet, fluid intake, or intake of certain drugs (e.g. morphine preparations) ultimately leads to a loss of control of bowel movements and consequently to unpleasant accidents.

The evacuation should be carried out stress free, undisturbed and planned with sufficient time. Defecation takes place in a relaxed seated position when done on a toilet seat or in a shower chair. If the evacuation occurs in bed, a left lateral position should be taken due to anatomical rationale.

To support the intestinal passage, i.e. defecation, a **massage of the intestine** is useful. This follows the normal track of the colon: beginning in the right lower abdomen of the patient, the massage follows the ascending portion of the colon (ascending colon), the transverse (transverse colon) and the descending portion (descending colon) to the sigmoid.

To support defecation a massage of the descending portion is especially suitable. It should therefore be carried out consistently and *during* defecation.



Movement of intestinal contents by peristalsis

The **evacuation reflex** is triggered by local irritation, either by a suppository or by stretching the sphincter with a gloved finger (with a circular motion).

In the absence of the evacuation reflex the mucous membrane and an extensively gentle manual removal of the sphincter is indicated.

A change in **diet** to one which is balanced and high in fibre, together with sufficient fluid intake (2 to up to 3 litres per day), is of great importance for the composition and shape of the stool (*see also information sheet on "Fibre-rich Diet"*).

In very special cases of prolonged diarrhoea and incontinence caused by a flaccid anal sphincter, the use of a dietary supplement has recently proved successful. The product is Stimulance®, whose practical application is described in detail in *Appendix 6.5*. In general, normalisation of stool consistency is achieved with one packet.

5. Auxiliary substances for bowel movement / influence on stool consistency

Note: Some drugs are usually not part of the comprehensive coverage of health insurance!
For further detailed information on individual effects, side effects, etc. see page 6 of the Appendix.

5.1. Oral laxatives (purgatives for intake)

With regular ingestion a soft, smooth bowel movement should be achieved through the storage of fluid. To some extent an improvement in peristalsis (bowel movement) can be expected. The effect of the preparations usually occurs from 12 hours to several days later (depending on the individual time of passage).
Suitable for daily use are

E.g.: Importal®, Movicol®, fig syrup, etc.

5.2. Rectal laxatives: suppositories and enemas

In principle, there are 3 different types of effects among suppositories:

- Improvement of the lubricity of the stool (e.g. Bulboid®)
- Activation of the strain stimulus, formation of CO2 (e.g. Lecicarbon®)
- Local irritation of the mucous membrane (e.g. Prontolax®)

The suppositories are to be inserted as deeply as possible. An effect can be expected after approximately 30 to 60 minutes.

A special group of laxatives serves as preparations for use as an enema. Consequently, the softened stool in the rectum and sigmoid colon empties within 5 to 20 minutes.

E.g.: Microklist®, Clyssie® etc.

5.3. Intensive acting laxatives (purgatives):

These are preparations with an intense effect, which each have a one-time-only application in pronounced constipation. Due to potentially harmful side effects (circulatory problems) and contraindications (intestinal obstruction) they should be prescribed by a physician. In particular, blood pressure changes during application in quadriplegic patients should be monitored.

E.g.: X–Prep®, Fordtran®, etc.

5.4. Bulking- and fibre agents:

With simultaneous intake of fluid, these cause increases in quantity and volume of faecal matter through their swelling capacity and thus an improvement in peristalsis. Particularly

early in treatment, this can lead to an increased development of gas. The amount and frequency of intake must be tailored to each patient.

E.g.: Mucilar® Avena, wheat bran, etc.

Fibre-rich foods and dietary supplements such as wheat bran and flax seeds in various forms

6. Appendix

Preparation Dosage	Effect	Effect after	Side effects
6.1. Oral Laxatives			
Duphalac® Syrup / Dry 2 x 15 – 30 ml 2 x 10 – 30 g	Osmotic laxative – poorly soluble sugars are degraded to amino acids in the colon → increase in osmotic pressure, increased stool volume, improved peristalsis.	12 – 48 h	At onset: meteorism, diarrhoea.
Feigensirup® fig syrup 2 x 15 – 30 ml	Laxative effect in the large intestine through mucous substances, fruit sugar and fruit acid.	over 24 h	Intestinal irritation, meteorism.
Importal® Sachet 1 x 1 – 2 Sachets	Osmotic laxative – for effects, see above.	12 – 48 h	At onset: meteorism, abdominal cramps, possibly nausea.
Prontolax ® Dragée 1 – 2 dragée / day	Contact laxative. Increase in intestinal peristalsis.	10 – 12 h	Abdominal cramps, meteorism, diarrhoea – loss of water and potassium, c to mucous membrane.
Transipeg forte® Packet 1 – 2 packets / day in 100 ml water	Iso-osmotic laxative effect Through binding of water, larger volume, intestinal walls are stretched, defecation stimulus is triggered.	24 – 48 h	Diarrhoea, vomiting, abdominal pain.

***Preparations** in italics* = not covered by health insurance

Preparation Dosage	Effect	Effect after	Side effects
Movicol ® Sachet 1 x 1-2 packets/day in 125 ml water	Osmotically acting laxative **In faecal stasis** (massive constipation): 8 sachets in 1 L water, within 6 hours.	8 -24 h Onset of effect depending on severity of constipation	No known side effects.

6.2. Rectal laxatives: suppositories, enemas

Bulboid Supp.® 1 x 1	Glycerine to facilitate the passage.	30 min.	Possible irritation of mucous membrane from prolonged use.
Lecicarbon Supp.® 1 x 1 – 2 (moisten with warm water)	Through production of CO2 – increase of secretion, reflexive activation of peristalsis.	15 – 30 min.	Irritation of mucous membrane, meteorism.
Prontolax Supp.® 1 x 1 - 2	Contact laxative. – increases peristalsis, inhibits reabsorption of water-/electrolytes. – Esp. in initial stage of paralysis.	20 – 30 min.	Possible damage to intestinal mucous membrane from long-term use.
Microklist® Enema	Saline laxative – softening of stool in rectum / sigmoid colon.	5 – 20 min.	Mild intestinal spasms. No habituation.
Clyssie® Enema	Saline Laxative. - Through hypertonic solution osmotically effective for emptying the sigmoid colon and rectum.	5 – 20 min.	Abdominal pain, cramps, salt loss.

Preparations *in italics* = not covered by health insurance

Preparation Dosage	Effect	Effect after	Side effects

6.3. Intensive laxatives (purgatives), for single use

X-Prep® Liquid 1/2 – 1 pack (+ plenty of liquid)	Increases the release of water into the colon and strengthens peristalsis.	5 – 8 h	Severe intestinal spasms may be avoided with proper fluid intake.

6.4. Bulking- / fibre agents (examples)

Metamucil Regular® Powder 1 – 3 tsp./day	Herbal intestinal regulator. Through increase in water absorption increase in stool volume.	12 – 48 h	Meteorism, bloating; in rare cases allergic reaction.
Mucilar® Avena 2 x 1 – 2 scoops	Combination of psyllium and oat bran, with a high, constant bulking factor.	Day/Weeks	At onset: meteorism.
Wheat Bran 1 – 6 tbsp. / day (2 dl liquid per tbsp.)	With sufficient liquid intake – swells up in the intestine, whereby the intestinal volume and the peristalsis become increased.	Days/Weeks	At onset: meteorism.

***Preparations** in italics* = not covered by health insurance

6.5. Nutritional Supplements

Stimulance Multi Fibre Mix®

Application:

Day 1: Start with dissolving 1 scoop (12.6 g powder) of Stimulance in 20 ml hot water – then add to any desired liquid (may also be cold).

Day 2+3: See Day 1.

Day 4: Dissolve 2x1 scoops of Stimulance and add to any desired liquid.
Administer 1 dose in the morning, 1 dose in the evening.

Day 5+6: See Day 4.

From Day 7: Dissolve 3x1 scoops of Stimulance and add to any desired liquid.
Take 1 dose with each main meal.

Normally, with 3-4 scoops of Stimulance per day stool consistency and frequency should improve and become more regular over time.

1 scoop of Stimulance (12.6 g powder) contains 5 g dietary fibre.

Preparations *in italics* = not covered by health insurance