
LAXATIVES

Abuse and dangers of laxatives

- Normal defecation empties the descending colon
- Laxatives, on the other hand, empty the whole colon
 - As a result, it takes a long time for the colon to fill up again
 - Because of this, a person taking a laxative may get a period where they do not need to go to the toilet for quite some time (because the colon is being filled up). However, the person may think that the reason they are not going to the toilet is because of something else and so keep on taking laxatives in the belief that they will become “regular” again.
 - This is very dangerous, because the bowel (having nothing in it) is continually being stimulated by these laxatives, even when it does not want to. Therefore, the natural mechanisms for bowel functioning down regulate - the result being a lazy bowel (atonic colon). If the person stops taking laxatives, the bowel cannot return back to normal, and so the person is dependent on laxatives for the rest of their life.
- Laxatives are also abused because they cause the loss of water (and electrolytes, nutrients)
 - The loss of water leads to weight loss
 - Therefore, people will use laxatives as a means of losing weight. All they are losing is fluid, not fat.

“Proper” use of laxatives

- Some drug produce severe constipation - the classic one is morphine
- People with hernias
- People with haemmaroids
- Before surgery - the surgeons do not want a patient defecating on the surgery table!
- Before pregnancy (sometimes, when the woman is straining, some poo pops out instead of the baby!!!)

The laxative drugs

1. Faecal softeners

- Have detergent like actions
- Change the surface tension of fluids in the bowel - this has an emulsifying effect on the faeces, making them retain more water and hence softer - easier to pass out
- The agent to remember is:
 - **Glycerine (know for exams!)**
 - Taken in the form of suppositories
 - Can be used in kids
 - **Liquid paraffin**
 - Oily, liquid substance
 - Not used anymore
 - Because it is predominantly fat - it absorbs the fat soluble vitamins in the gut, and therefore you lose your fat soluble vitamins.
 - It tends to leak out of your bum and cause local anal irritation

2. Bulk laxatives

- Includes the natural fibres which should be a part of everyone’s diet
 - e.g. Pectins (in dried fruits - prunes), Bran
- Very important for normal bowel movements
- May decrease the risk of colon cancer
- Artificial bulk laxatives:
 - **Metamucil**
 - Little granules which swell up in the gut, adding to faecal bulk
 - The stretch in the gut wall causes a reflex activation of peristalsis
 - Swell up in the stomach making you feel full - stop eating
 - Problems:
 - Need to take them with lots of water, otherwise they can impact in the bowel causing obstruction. May also lodge in the oesophagus, and block it off
 - Do not take these if you have an atonic colon (due to abuse of irritant laxatives - see later). These agents only work if there is normal reflex bowel activity.

- Can cause flatulence (initially)

3. Saline laxatives

- Retain water in the gut by exerting an osmotic pressure
- Given as a hypertonic solution which will draw water out into the gut lumen
- **Mg Sulphate (Epsom salts)**
 - Recall that MgOH, an antacid, can also cause diarrhoea (a laxative effect)
 - Dangerous because:
 - Cause a lot of fluid and electrolyte loss leading to severe dehydration
 - Diarrhoea
 - Absorption of the cations can result in toxicity if in high enough doses

4. Irritant laxatives

- **Bisacodyl (know for exams!!)**
- Most dangerous
- Act on sensory nerve ending on the gut to stimulate peristalsis directly
- Also irritate the intestinal mucosa
- Results in excess gut motility (causing colic) and excess fluid loss
- Most likely to result in an atonic colon if used in excess
 - An atonic colon is when there is loss of the normal reflex activity of the gut (hence you cant take bulk laxatives)
 - Atonic colon causes you to get impacted faeces.
 - The only treatment for an atonic colon is to take laxatives for the rest of your life

ANTI DIARRHOEAL AGENTS

- The most common condition afflicting travelers is diarrhoea. Why?
 1. Due to infection with *E. coli* (ETEC) - especially if in an underdeveloped country
 2. Due to different types of exotic foods the gut is not used to
 3. Due to changes in bowel habits
- Diarrhoea is dangerous in the very young and very old
 - Loss of fluid and electrolytes can be life threatening
 - It is important to replace fluids and electrolytes regularly
- If the diarrhoea is due to a bacterium, it is recommended to not stop the diarrhoea - just use fluid replacement therapy.

The drugs:

- **Panadeine ®**
 - Contains codeine
 - Codeine is similar to morphine with only reduced potency
 - It therefore causes mild constipation
- Increase the viscosity of gut contents:
 - **Kaolin, chalk, charcoal**
- Drugs which delay the passage of gut contents by paralysing the gut
 - The gut is innervated by cholinergic mechanisms
 - If these mechanisms are blocked, the gut will be effectively paralysed
 - **Opiates - morphine**
 - **Diphenoxylate**
 - A synthetic analogue of morphine
 - **Loperamide (Know for exams!!)**
 - Much safer than the above two
 - No prescription required
 - Does not cross the BBB
 - Muscarinic receptor antagonists
 - **Propantheline**
 - **Atropine methylnitrate**
 - **Pirenzepine**

OTHER AGENTS AFFECTING THE GUT

Spasmogens

- Sometimes you want to stimulate the gut peristalsis (e.g. After an abdominal operation, paralytic ileus)
- Can give parasympathomimetics or anticholinesterases
 - M agonists:
 - **Bethanecol**
 - **Carbachol**
 - Anticholinesterases:
 - **Neostigmine bromide**
- **Simethicone**
 - Used for the treatment of flatulence (excessive gas buildup in the gut)
 - Used in antacid mixtures to prevent the flatulence which often occurs
 - Anti colic drops for babies
 - Mechanisms of action:
 - Changes the surface tension of air bubbles in the gut
 - Allow small air bubbles to fuse to become bigger ones - this makes it easier to fart out all the gas
- **Activated charcoal**
 - Adsorbs gas, toxic substances and nutrients in the gut