

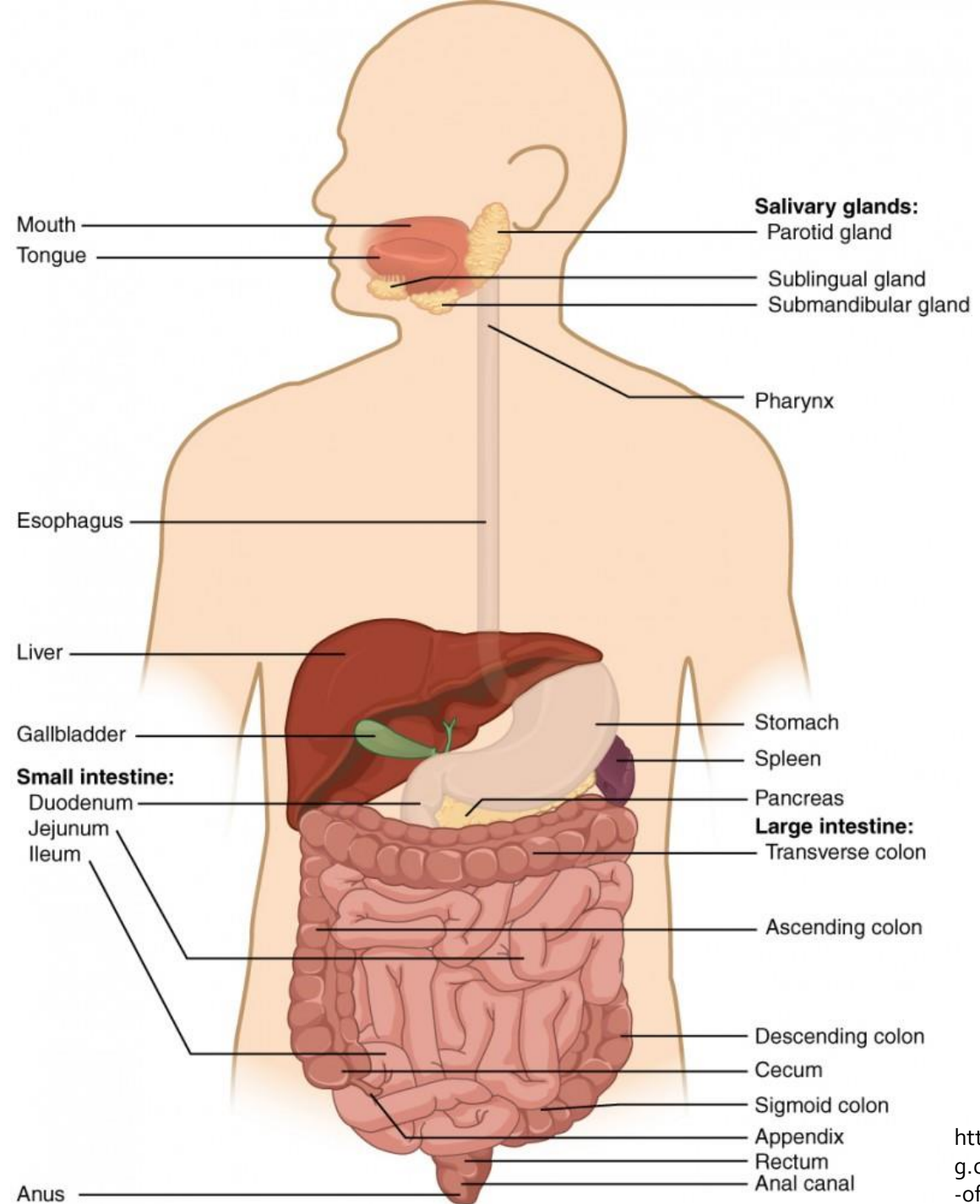
Medications and ostomies

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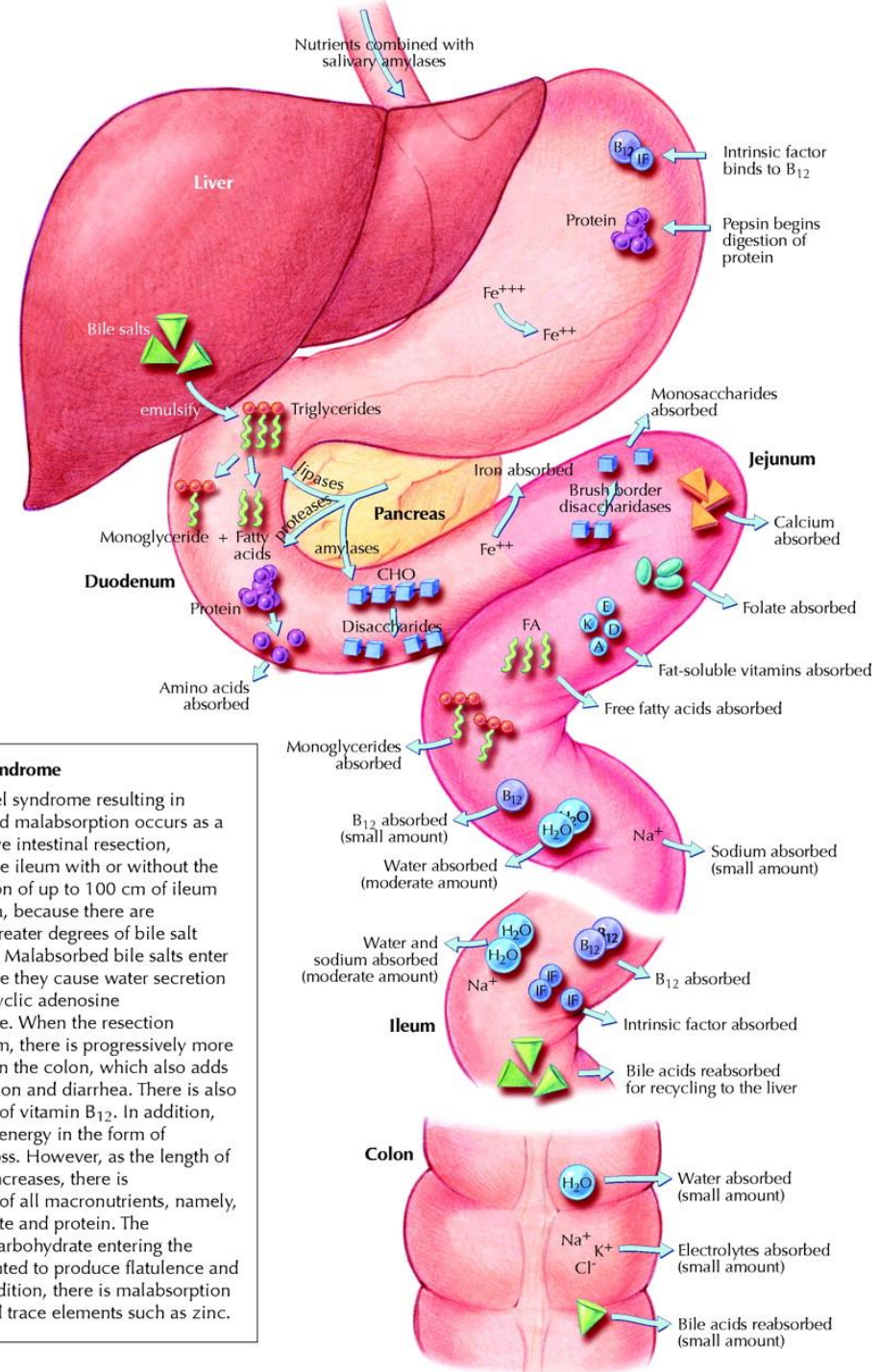
Overview

1. Medication absorption
2. Medication forms
 1. Oral medications
 2. Non-oral medication routes
3. Monitoring medications
4. Specific medications
5. Medications for high output ostomies

The gastrointestinal tract



Absorption



Short bowel syndrome
 The short bowel syndrome resulting in dehydration and malabsorption occurs as a result of massive intestinal resection, especially of the ileum with or without the colon. Resection of up to 100 cm of ileum causes diarrhea, because there are progressively greater degrees of bile salt malabsorption. Malabsorbed bile salts enter the colon where they cause water secretion by activating cyclic adenosine monophosphate. When the resection exceeds 100 cm, there is progressively more fatty acid loss in the colon, which also adds to water secretion and diarrhea. There is also malabsorption of vitamin B₁₂. In addition, there is loss of energy in the form of increased fat loss. However, as the length of the resection increases, there is malabsorption of all macronutrients, namely, fat, carbohydrate and protein. The malabsorbed carbohydrate entering the colon is fermented to produce flatulence and diarrhea. In addition, there is malabsorption of vitamins and trace elements such as zinc.

Oral medication absorption

- Medications taken by mouth are swallowed (tablets, capsules, liquids)
- The stomach starts to break down medications
- The small bowel (large surface area, high blood flow) is where most medications are absorbed
- Gastric emptying and transit time also play a role

Oral medication forms

- Tablets
- Capsules
- Liquids
- Extended-release formulations

Extended and controlled release formulations

- Modified-release drug products are medications in a formulation that affect the timing or rate of release
 - Therapeutic effects
 - Convenience
- Extended-release drug products
 - Controlled-release
 - Sustained-release
 - Long-acting
- Delayed release
 - Enteric coated
- Targeted release
- ER, SR, XL, XR, CD

Extended and controlled release formulations

- Coating the drug (i.e. with wax)
- Using a matrix
- Using a resin
- Generally should not be opened, crushed, chewed, cut or modified
 - Too much medication released at once may cause an overdose
- Many of these formulations are absorbed to some extent in the colon

Extended and controlled release formulation examples

- Opioids
 - MS CONTIN (morphine)
 - DILAUDID SR (hydromorphone)
 - OXYCONTIN (oxycodone)
- Antiepileptic drugs
 - Carbamazepine CR
 - Valproic acid or divalproex EC
- Blood pressure medications
 - Nifedipine XL
 - Diltiazem CD
- ADHD medications
 - CONCERTA ER
- And many others!
 - Quetiapine SR
 - SINEMET CR
 - Burpropion SR
 - Venlafaxine XR
 - Bisacodyl DR

Extended and controlled release formulations

- What can we do?
 - Use immediate release products
 - Use alternate routes of administration
 - Monitor for efficacy and toxicity

Immediate release formulations

- Many medications
- Designed to release ingredient shortly after ingestion with quick onset
- When in doubt...
 - Ask your pharmacist!
 - Ask any pharmacist!
 - Try dissolving the medication in a small amount of water

Liquids

- Medications in liquid form generally well-absorbed early in the digestive tract
- But...think about sugar!
 - Sugar can cause diarrhea or make it worse
- Many liquid medications come as sugar free formulations
- Some common medications in liquid form
 - Acetaminophen (TYLENOL)
 - Diphenhydramine (BENADRYL)
 - Ibuprofen
 - Antibiotics
 - Cough and cold syrups

Alternate medication routes

- Sublingual
- Buccal
- Transdermal
- Subcutaneous
- Intramuscular
- Intravenous

Monitoring for efficacy and toxicity

- What can we measure?
 - Blood pressure
 - Drug levels
 - Digoxin
 - Antiepileptic drugs
 - Other blood tests
 - Warfarin
 - Pain
 - Symptoms

Specific
medications

Vitamin B₁₂

- Absorbed in colon
- Consider monthly injection

Oral hormonal contraceptive

- Ileostomy: switch to alternate form
- Injections
- Implant
- Patch
- IUD
- Local delivery system

Antibiotics

- Diarrhea culprit!
- Disrupt normal gut flora
- Consider probiotic
- Fluids with electrolytes while on antibiotics
- Watch for fungal infections around stoma
 - Can be treated with cream

Opioids

- Opioids cause constipation!
- Drink plenty of fluids
- Avoid stimulant laxatives (senna, bisacodyl)
- Colostomy: May consider “gentle” laxatives or bulk forming agents
 - Ask your physician or pharmacist!

Antacids

- Colostomy: avoid aluminum based antacid
 - Constipation
- Ileostomy: avoid magnesium based antacids
 - Diarrhea
- Individuals may respond differently – some trial and error
- Do not exceed recommended amount
 - Electrolyte imbalances
- Alternatives:
 - Ranitidine (ZANTAC)
 - Proton pump inhibitors (i.e. PANTALOC)

Diuretics

- Common class used to treat high blood pressure, heart failure, fluid overload, other indications
- Examples: hydrochlorothizide, chlorthalidone, furosemide, spironolactone
- Can cause electrolyte disturbances, dehydration
- Use with caution

Other medications that affect the gut

- Antidepressants may cause diarrhea, especially when first started
- Anticholinergic medications may slow GI transit time, cause constipation
 - Parkinson's medications
 - BENADRYL
 - Antipsychotics
 - Scopolamine (patch for motion sickness)
 - Drugs for urinary incontinence (oxybutynin, tolterodine, VESICARE...)

Medications that may discolour feces

Table 1. Common Medications That May Discolor Feces

BLACK	BLUE	ORANGE/RED
Acetazolamide	Boric acid	Phenazopyridine
Alcohols	Chloramphenicol	Rifampin
Aluminum hydroxide	Methylene blue	
Amphetamine		
Amphotericin B	DARK-BROWN	WHITE/SPECKLING
Anticoagulants	Cocoa	Aluminum hydroxide
Barium	Dexamethasone	Barium
Charcoal		Some antibiotics (oral)
Chloramphenicol		
Cholestyramine	GRAY	RED/PINK
Clindamycin	Cocoa	Anticoagulants
Corticosteroids	Colchicine	Barium
Cyclophosphamide	Some antibiotics (oral)	Blackberries
Digitalis		NSAIDs
Ethacrynic acid		Rifampin
Fluorouracil	GREEN	Salicylates
Hydralazine	Bismuth salts	Senna
Iron salts	Indomethacin	Tetracycline syrup
Levodopa	Iron salts	
Methotrexate	Medroxyprogesterone	
Methylxanthines	Pancrelipase	
Nitrates	Senna	
NSAIDs		
Phenylephrine		
Potassium salts		
Salicylates (Aspirin, Bismuth)		
Sulfonamides		
Tetracycline		

Abbreviations: NSAIDs – Nonsteroidal anti-inflammatory drugs, QAPI – Quality Assurance Performance Improvement.

High output stoma treatments

- Anti-diarrheal medications
 - Loperamide (IMODIUM)
 - Doses may be higher than doses written on the box!
 - Diphenoxylate and atropine (LOMOTIL)
 - Codeine
- Anti-secretory drugs
 - Proton pump inhibitors
 - Octreotide

Take away points

- Talk to your physician or pharmacist before starting a new medication, natural health product, or dietary supplement
- Make sure your community pharmacist is aware you have an ostomy
- Watch if medications are coming out in your ostomy bags
 - Sometimes the medication shell will make it through, but the medication will be absorbed
- If in doubt – ask!





Thank you!

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