

# Short bowel syndrome

Bible class 10.02.2021

# Small bowel syndrome

Definition

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## Definition

Malabsorption due to congenital absence or resection of large portions of the small intestine, typically leaving the adult with 150-200 cms of functional small intestine

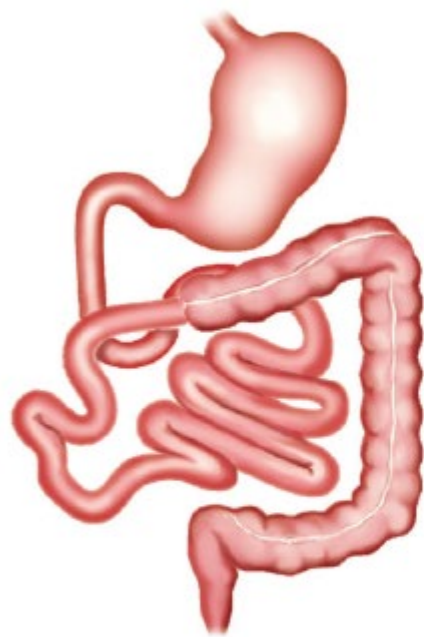
# Small bowel syndrome

## Aims of treatment

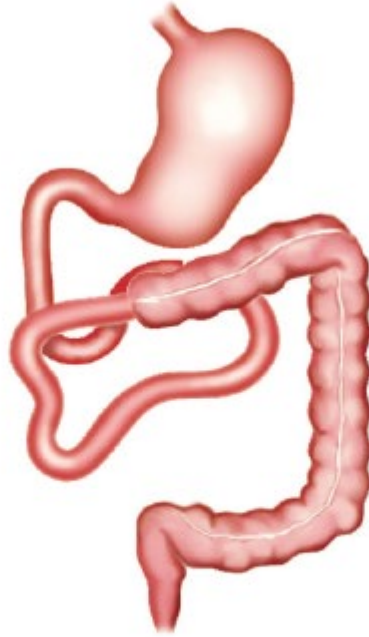
- To provide the nutrition, water, and electrolytes necessary to maintain health, with normal body weight or growth
- To use oral/enteral nutrition in preference to parenteral nutrition whenever the gut is functional and can absorb sufficient nutrients, water, and electrolytes
- To reduce the complications resulting from the underlying disease, intestinal failure, and/or nutritional/fluid support
- To achieve a good quality of life

3 common types of intestinal resection

# 3 common types of intestinal resection



Ileocolonic  
anastomosis

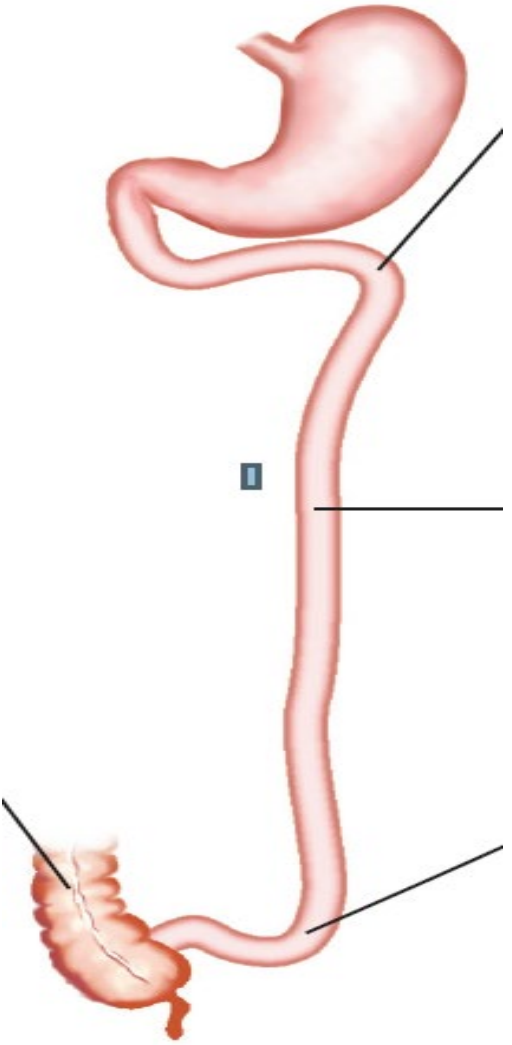


Jejunocolonic  
anastomosis

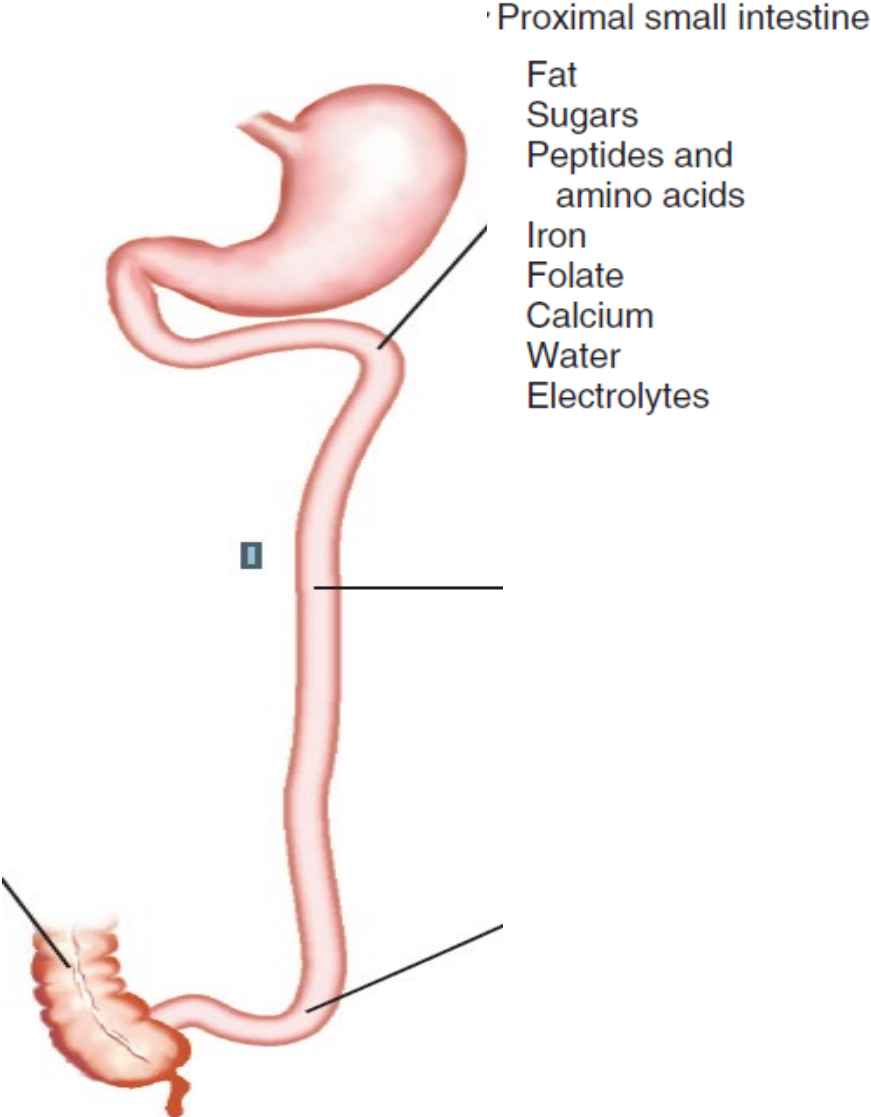


End-jejunostomy

# Absorption of dietary constituents

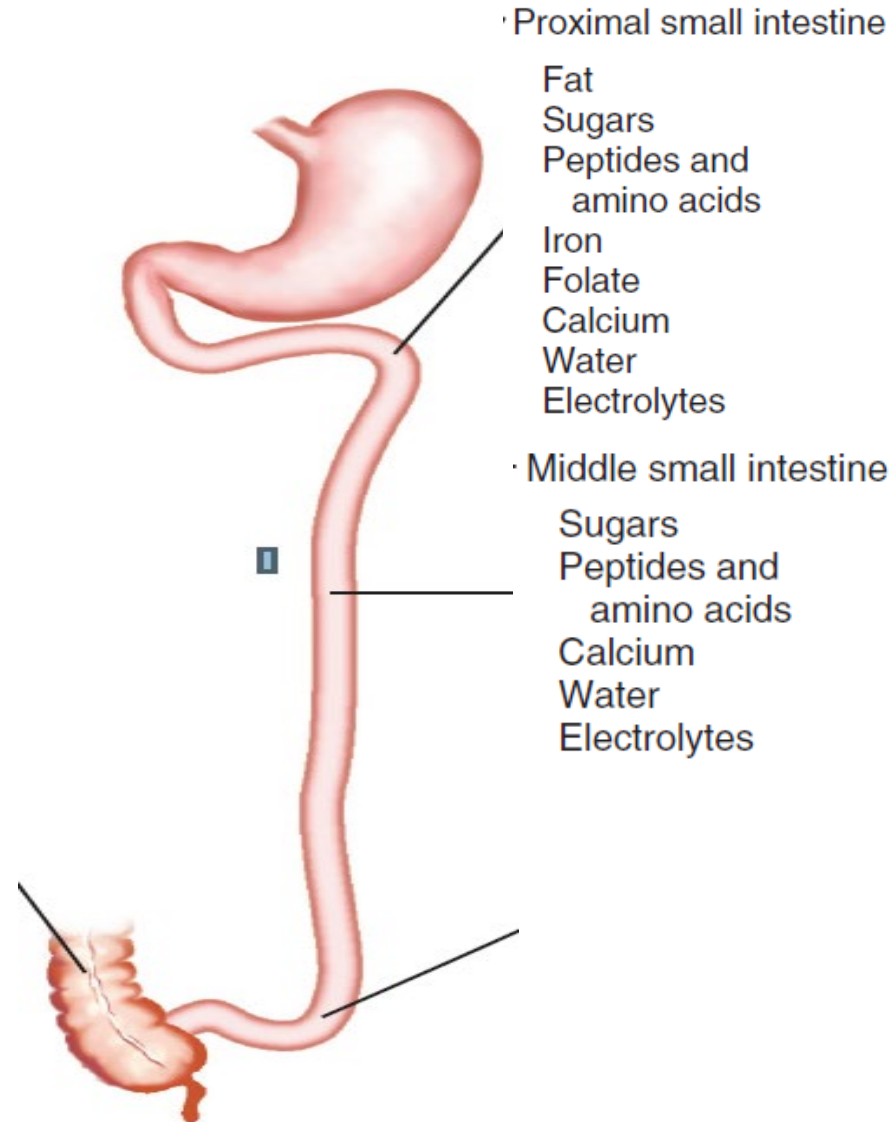


# Absorption of dietary constituents

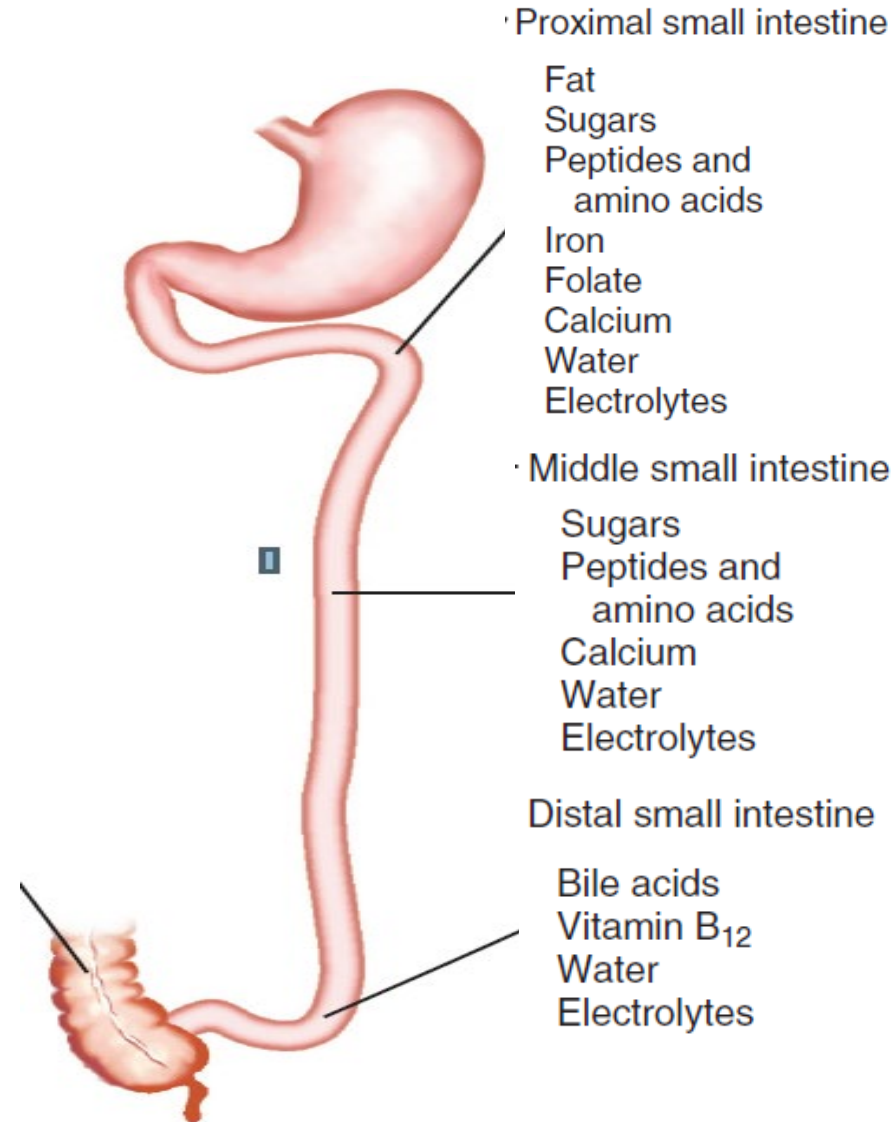




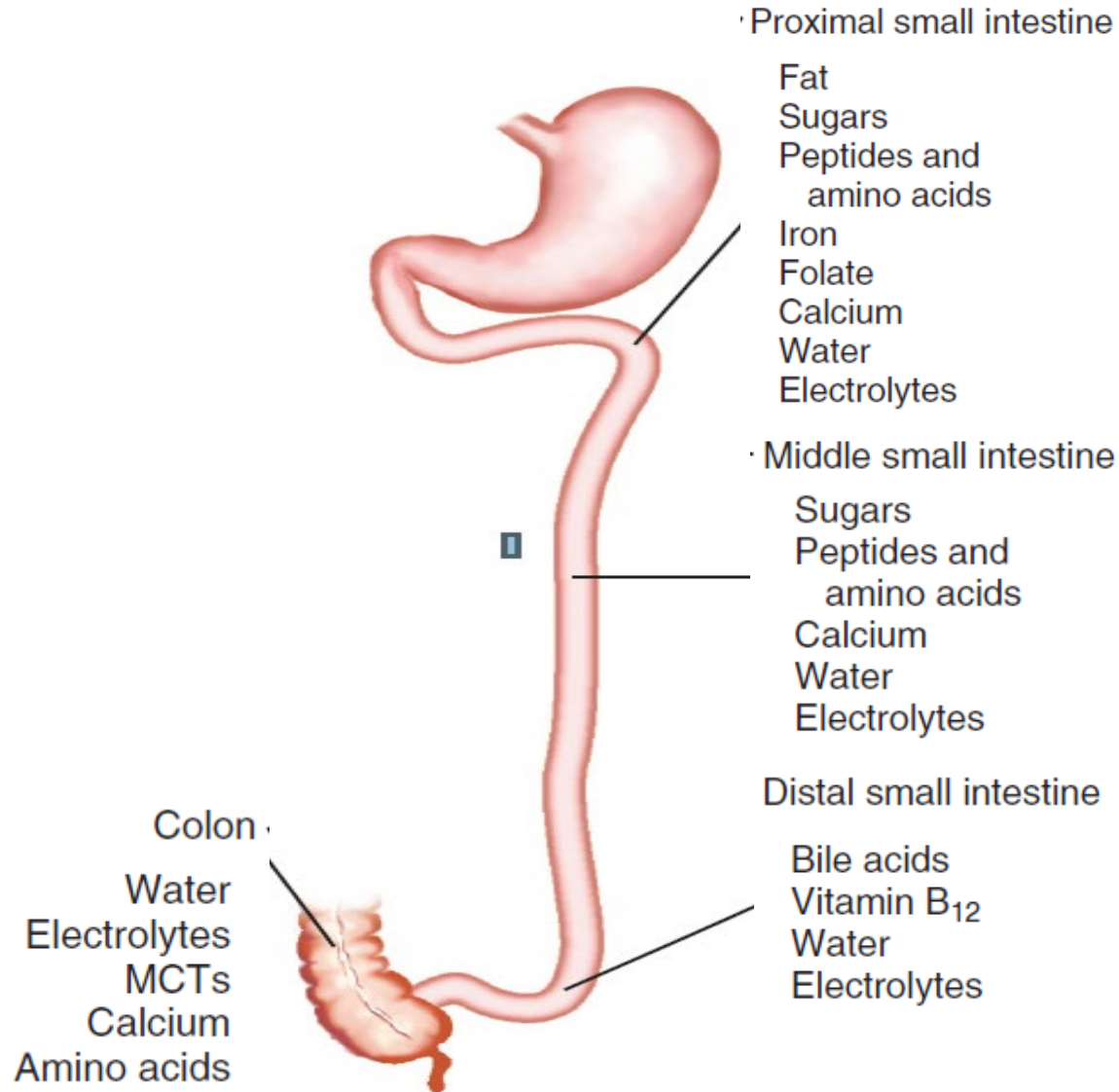
# Absorption of dietary constituents



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Intestinal failure

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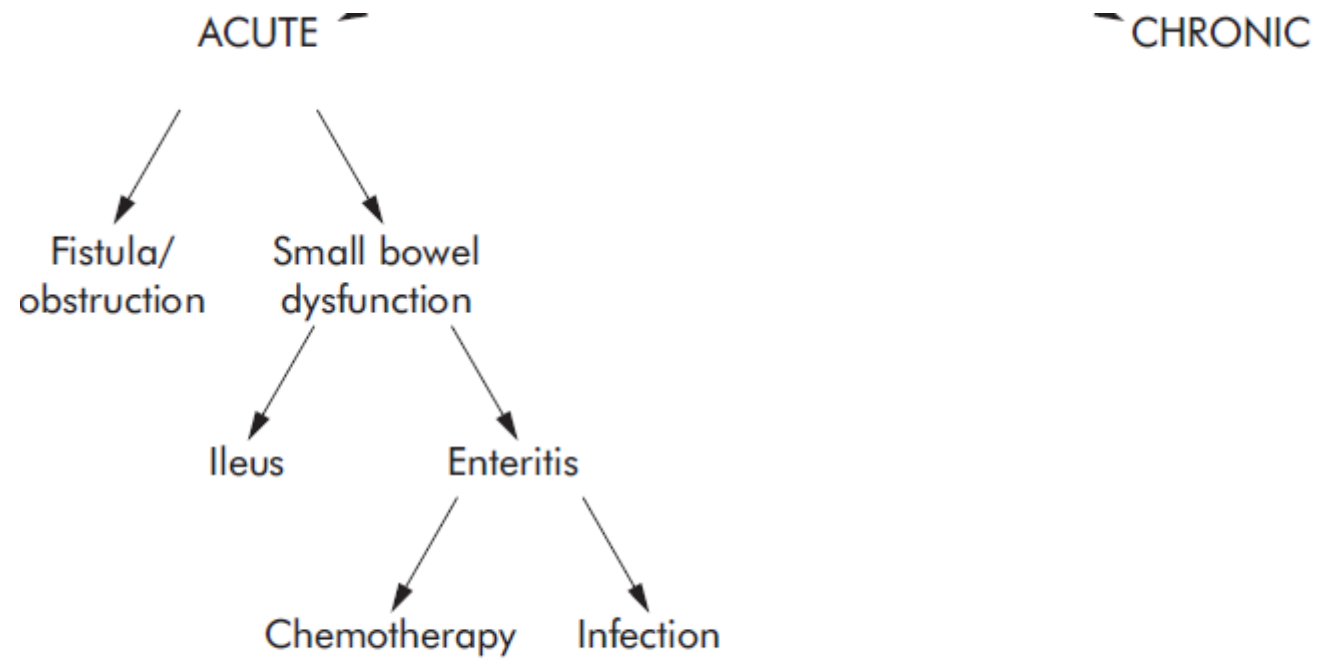
Intestinal failure occurs when there is reduced intestinal absorption so that macronutrient and/or water and electrolyte supplements are needed to maintain health and/or growth

# Intestinal failure

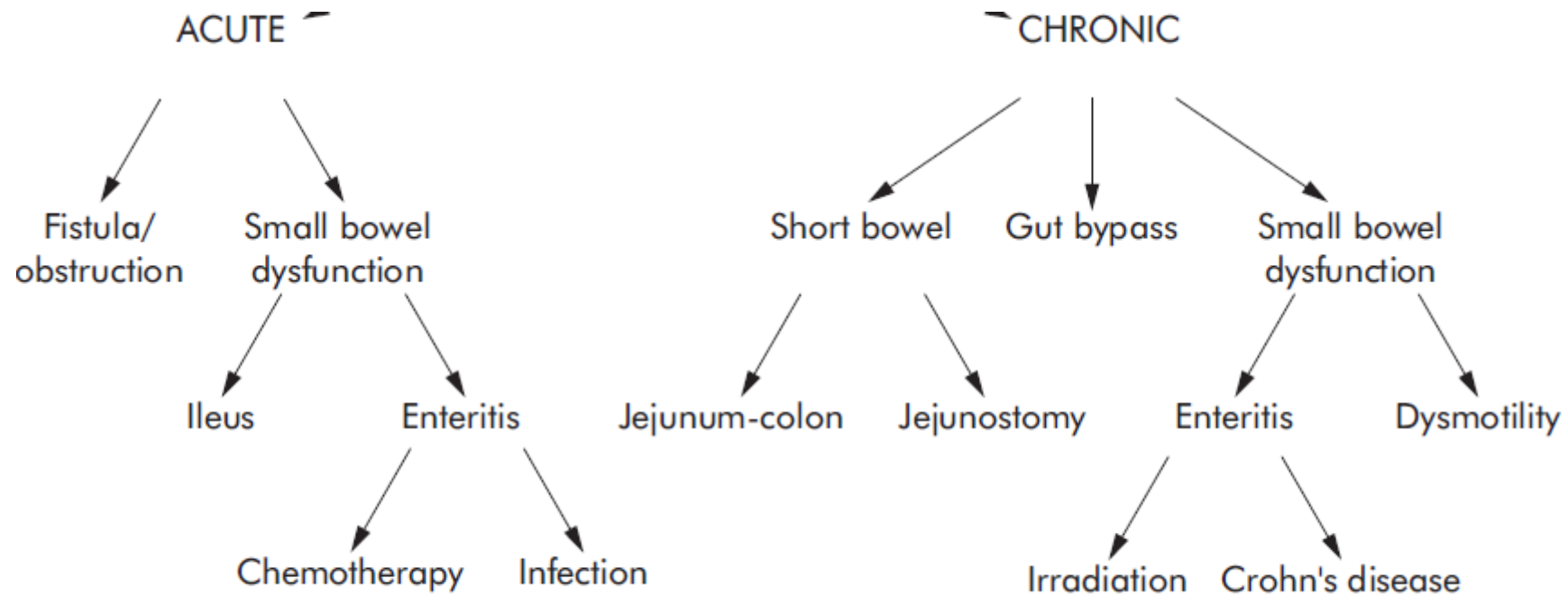
ACUTE ↗

↘ CHRONIC

# Intestinal failure



# Intestinal failure





# Short bowel

- Normal length of the small bowel?

# Short bowel

- Normal length ?

275-850 cm

- Cut off?

Less than 200 cm of small bowel remaining

# Physiological consequences

## Gastrointestinal motility

Gastric emptying and small bowel transit for liquid:

- In jejunum-colon patients ?

# Physiological consequences

## Gastrointestinal motility

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- In jejunostomy patients?

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# Physiological consequences

## Gastrointestinal motility

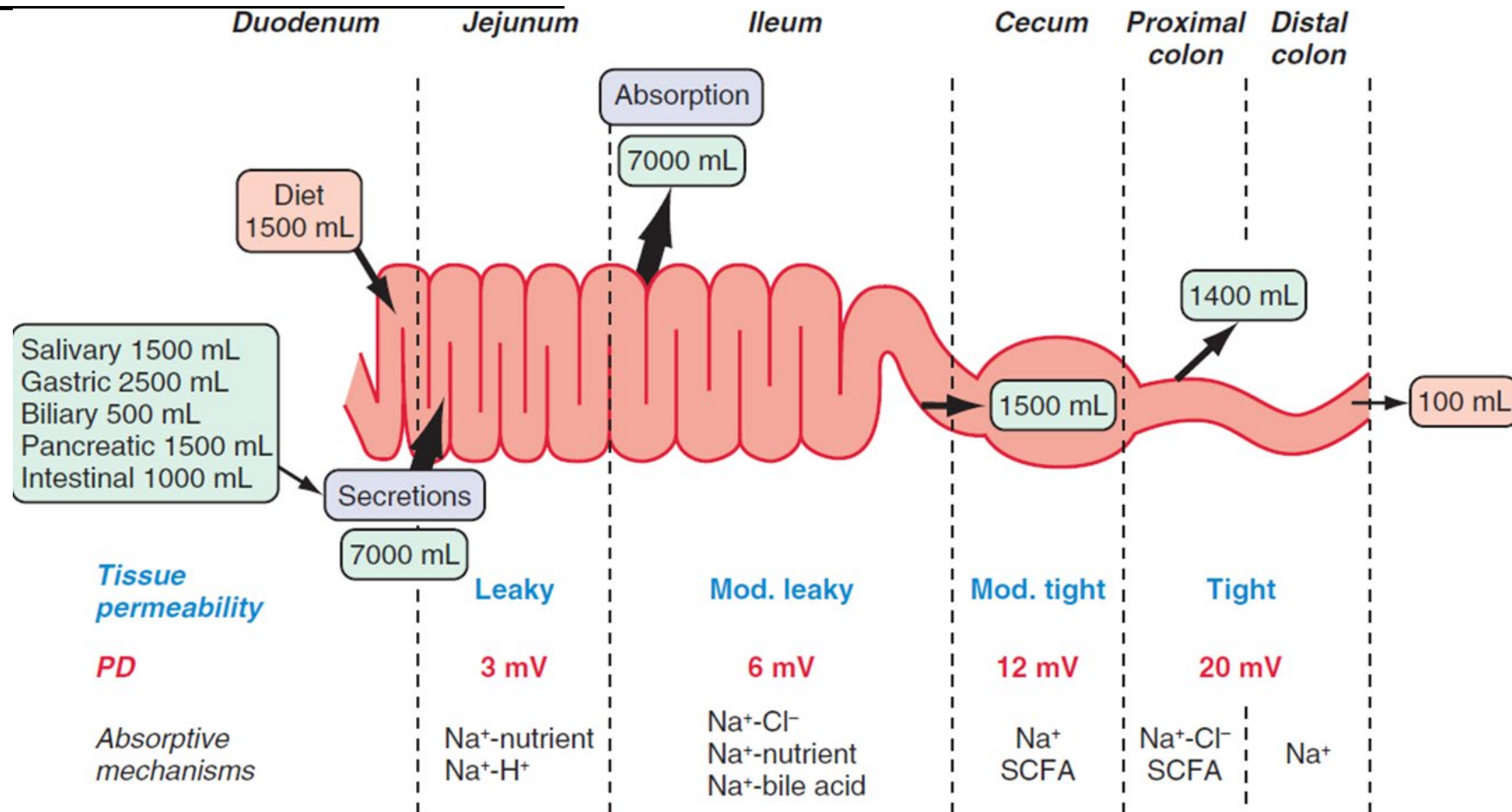
Gastric emptying and small bowel transit for liquid:

- In jejunum-colon patients ? Normal
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Ileocolonic braking mechanism: Peptide YY, GLP-2

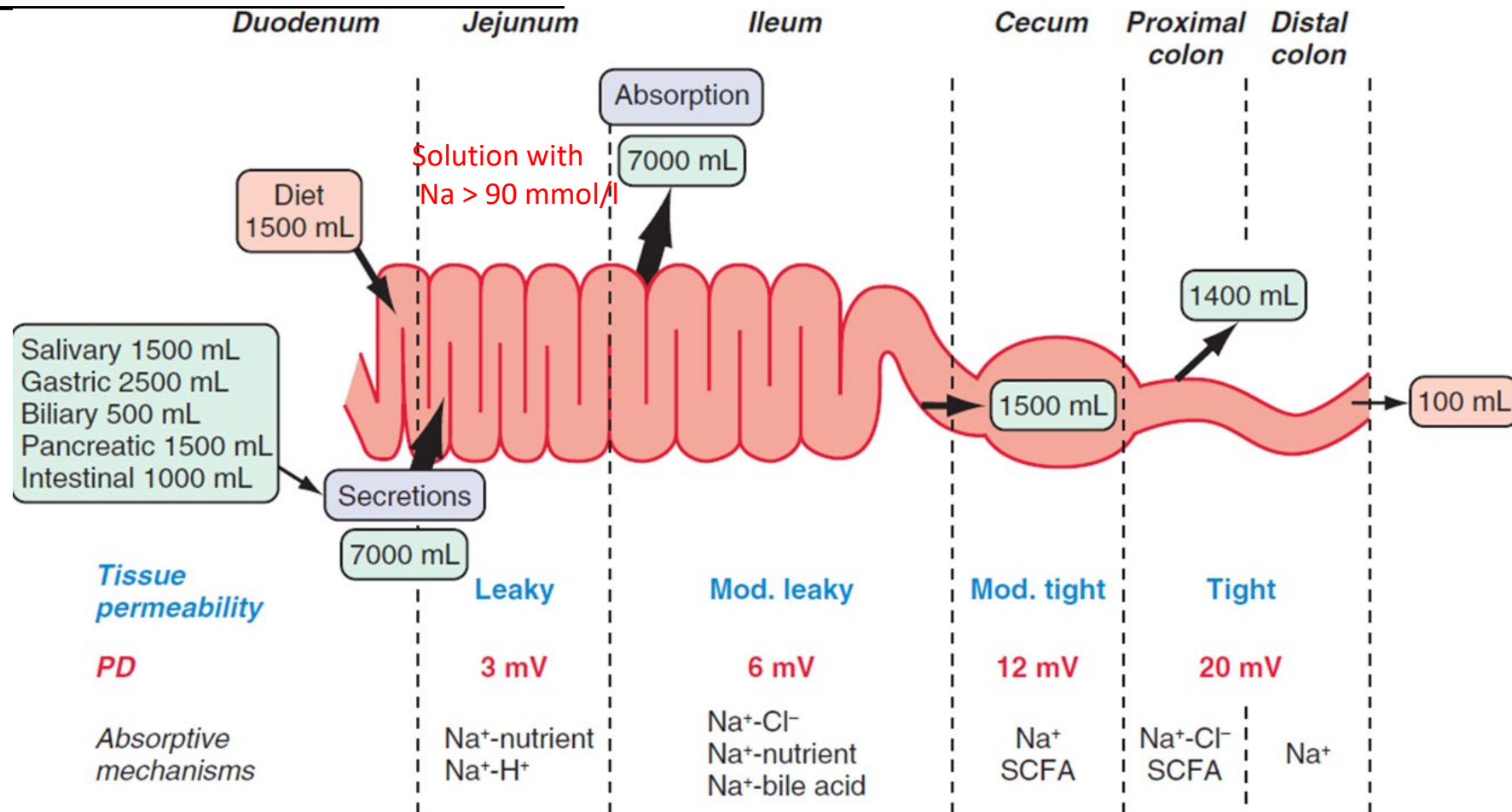
# Physiological consequences

## Gastrointestinal secretions



# Physiological consequences

## Gastrointestinal secretions





# Physiological consequences

## Absorptive functions

Resection of > 60-100 cm terminal Ileum :

# Physiological consequences

## Absorptive functions

Resection of > 60-100 cm terminal Ileum : Vitamin-B12 , fat malabsorption

# Physiological consequences

## Absorptive functions

Resection of > 60-100 cm terminal Ileum : Vitamin-B12 , fat malabsorption

Mg deficiency: chelation with unabsorbed FA, increased renal excretion

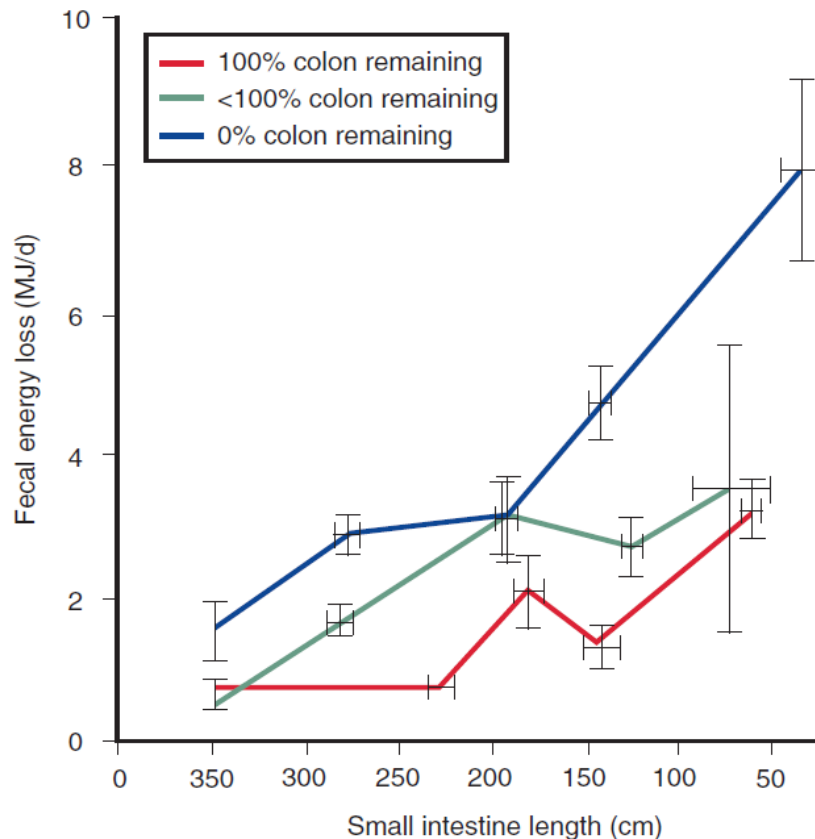
# Physiological consequences

Adaptative processes

# Physiological consequences

## Adaptative processes

More pronounced in the ileum than the jejunum



*Nordgaard I, Hansen BS, Mortensen PB. Colon as a digestive organ in patients with short bowel. Lancet 1994; 343:373-76.)*

# Clinical assessment

# Clinical assessment

- water, sodium, magnesium, nutritional status

Jejunal length (cm)	Jejunum-colon	Jejunostomy
0-50		
51-100		
101-150		
151-200		

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# Clinical assessment

- water, sodium, magnesium, nutritional status

Jejunal length (cm)	Jejunum-colon	Jejunostomy
0-50	PN	PN+PS
51-100	ON	PN+PS
101-150	none	ON+OGS
151-200	none	OGS

- Daily BW, fluid balance
- Creatinine, K, Mg, urinary Na

# Jejunum-Colon patients

- Salt, water, Mg
- Vitamin and mineral deficiencies

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- Vitamin and mineral deficiencies: B12, Selenium, Vit A, D, E, K
- Diarrhoea: loperamide 2-8 mg 30 min before meal, codeine and if > 100 cm of term ileum have been resected : Cholestyramine
- Confusion:

# Jejunum-Colon patients

- Salt, water, Mg
- Vitamin and mineral deficiencies: B12, Selenium, Vit A, D, E, K
- Diarrhoea: loperamide 2-8 mg 30 min before meal, codeine and if > 100 cm of term ileum have been resected : Cholestyramine
- Confusion: common causes (hypoxia, hepatic, renal, cardiac failure, sepsis), Hypomagnesaemia, thiamine deficiency, D(-) lactic acidosis, hyperammonaemia

# Jejunum-Colon patients

- Gall stones:

# Jejunum-Colon patients

- Gall stones:

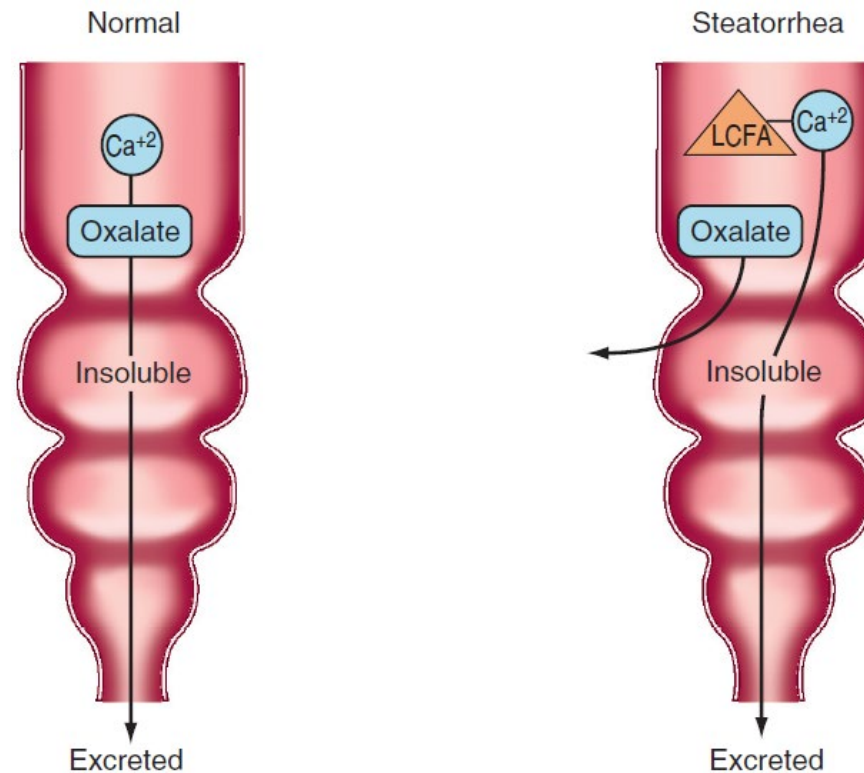
common (45%), more common in men, due to stasis



# Jejunum-Colon patients

- Gall stones:  
common (45%), more common in men, due to stasis

- Renal stones:  
(25%), calcium oxalate stones,



## Foods Classified by Oxalate Content

Little* or None (<2 mg per Serving) Eat as Desired	Moderate (2-10 mg per Serving) Limit: Two 1/2-cup Servings per day	High (>10 mg per Serving) Avoid Completely
<b>Beverages</b>		
Apple or pineapple juice Bottled beer Coffee Colas (12-oz limit/day) Distilled alcohol Milk, yogurt Orange juice (4 oz) Tap water Wine (red, rosé)	Cranberry juice (4 oz) Grape juice (4 oz) Nescafe powder	Cocoa Draft beer Juices containing berries Lemonade or limeade Tea Tomato juice
<b>Meats, Fish</b>		
Lean lamb, beef, pork Poultry Seafood	Sardines	
<b>Vegetables</b>		
Asparagus Avocado Brussels sprouts Cabbage Cauliflower Mushrooms Onions Potatoes Radishes Sweet corn	Broccoli Cucumber Eggplant Green peas Lettuce Lima beans Squash Tomato, 1 small Turnips Vegetable soup	Beans Beets Carrots Celery Chives Collards Dandelion greens Endive Escarole French fried potatoes Kale Leeks Okra Parsnips Sweet potato Swiss chard

<b>Fruits</b>		
Bananas Cherries, Bing Grapefruit Grapes, white Mangos Melons Nectarines Pears Pineapple Plums, green/golden	Apples Apricots Black currants Cherries, red sour Fruit cocktail Orange Peaches Plums, red Prunes	Berries Concord grapes Red currants Tangerines
<b>Bread, Pasta, Cereal</b>		
Macaroni Noodles Oatmeal Rice Spaghetti White bread	Cornflakes Spaghetti, canned in tomato sauce Sponge cake	Bran cereal Grits, white corn Soybean crackers Wheat germ
<b>Miscellaneous</b>		
Butter Cheese, cheddar Eggs Jelly or preserves (made with allowed fruits) Mayonnaise Salad dressing Soups (made with allowed ingredients) Sugar Vegetable oils	Chicken noodle soup, dehydrated Fruitcake	Chocolate Nuts Peanut butter Pepper (>1 tsp/day) Pretzels Soybean curd (tofu)

Jejunostomy patients

# Jejunostomy patients

- Exclude/treat causes other than a short bowel
- Correct dehydration with intravenous saline while the patient takes nothing by mouth for 24–48 hours
- Reduce oral hypotonic fluids to 500 ml/day
- glucose/saline solution to sip (sodium concentration >90 mmol/l)
- Add NaCl to any liquid feeds to make the sodium concentration near to 100 mmol/l
- Give drugs to reduce motility; loperamide 2–8 mg
- If net “secretory” output (>3 l/24 hours), PPIs or if unable to absorb oral drugs, octreotide can reduce stomal output by 1–2 l/24 hours
- Correct hypomagnesaemia

# Other agents

- GLP-1 analogues

## Liraglutide

Liraglutide reduced ostomy wet weight output by  $474 \pm 563$  g/d from  $3249 \pm 1352$  to  $2775 \pm 1187$  g/d ( $P = .049$ , Student t test). Intestinal wetweight absorption tended to increase by  $464 \pm 557$  g/d ( $P = .05$ ), as did urine production by  $765 \pm 759$  g/d ( $P = .02$ ). Intestinal energy absorption improved by  $902 \pm 882$  kJ/d ( $P = .02$ ).

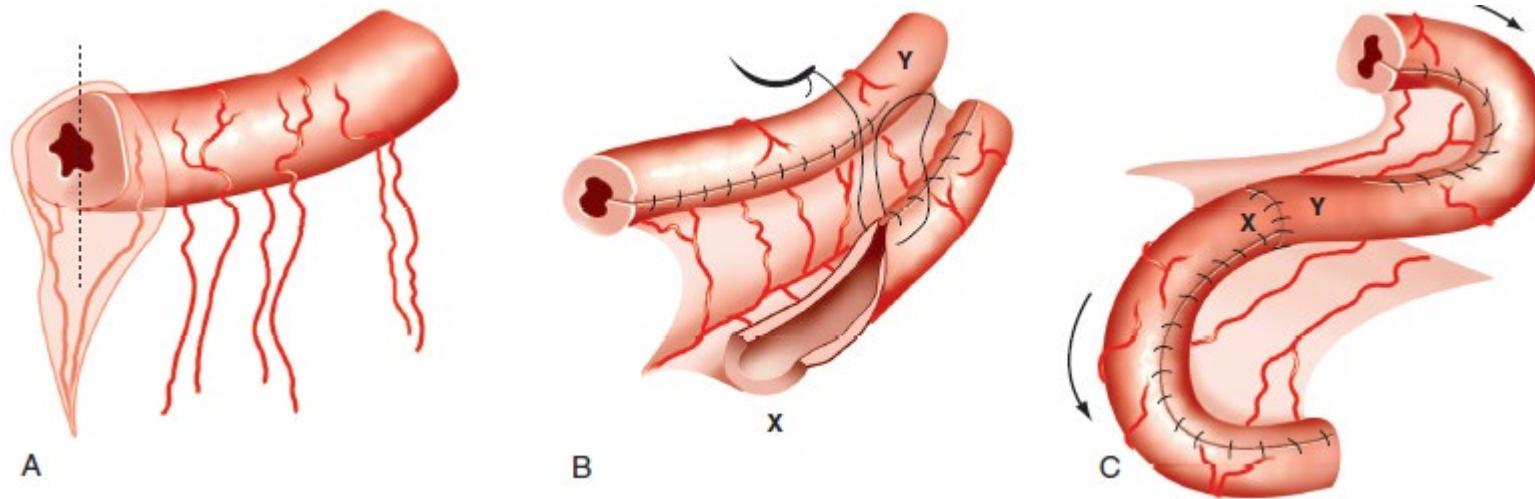
[Hvistendahl M, Brandt CF, Tribler S, et al. Effect of Liraglutide Treatment on Jejunostomy Output in Patients With Short Bowel Syndrome: An Open-Label Pilot Study. JPEN J Parenter Enteral Nutr 2018; 42:112.](#)

- GLP-2 analogues

## Teduglutide

# surgery

- **Autologous gastrointestinal reconstruction**



- **Intestinal transplantation**

Thank you