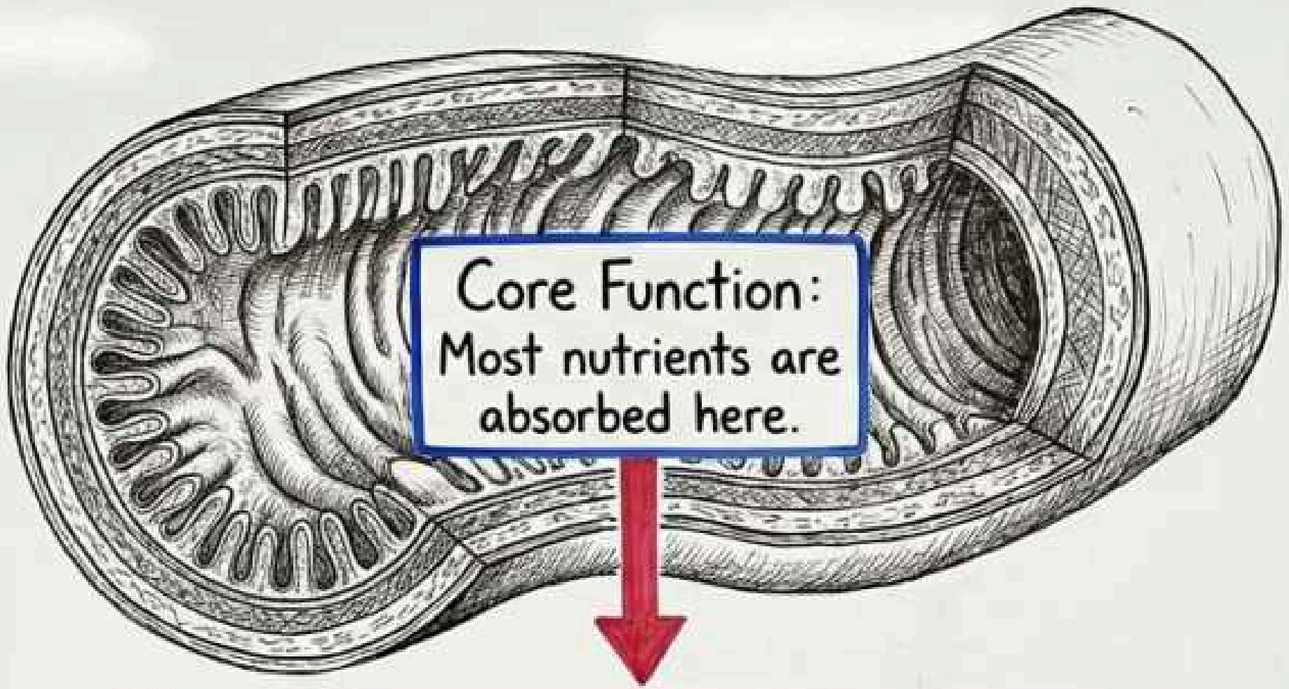
MED 524 B - Lecture 3: The Small Intestine, Absorption and Diarrhoea

¶ 3.1



Core Function:
Most nutrients are absorbed here.

Pathology: Lining damage / Digestion interference → Malabsorption

GI Symptoms:
Diarrhoea (pale/greasy due to unabsorbed fat), Bloating

Systemic Symptoms:
Weight loss

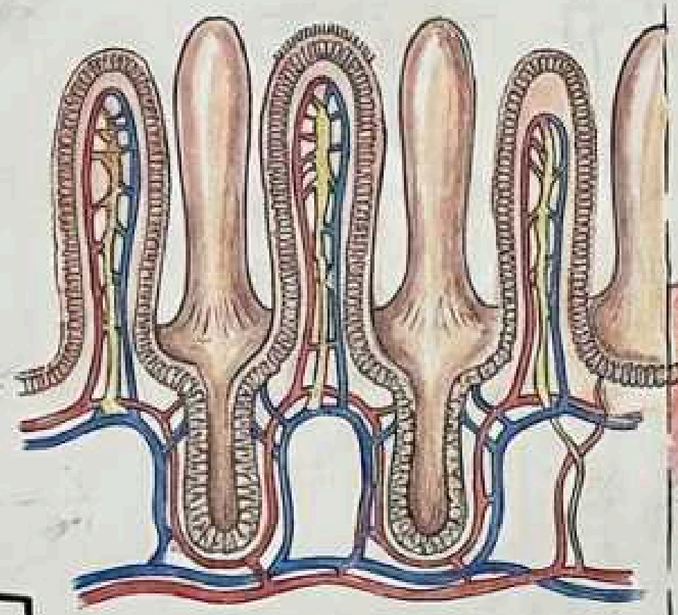
Deficiencies:
Lack of Iron/Vitamins/Minerals → Anaemia, Bone weakness, Nerve problems

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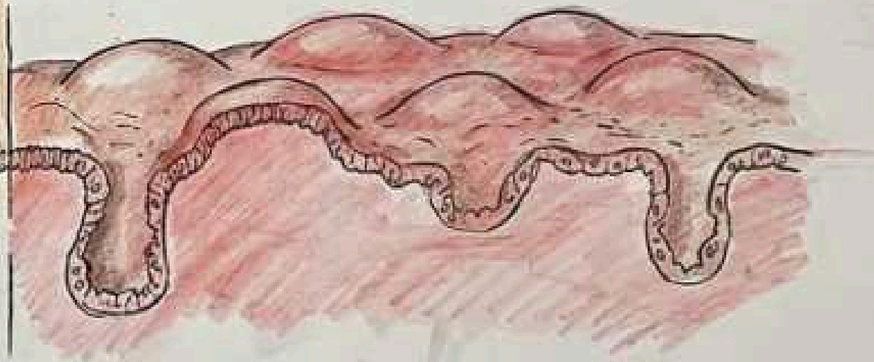
Coeliac Disease Pathophysiology

¶ 3.2

Gluten (wheat, barley, rye) + Genetic Susceptibility → Immune Inflammation



Healthy Villi



Flattened villi = Severely reduced absorbing surface

[Affects ~1% of many populations; high rate of undiagnosed cases.]

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Coeliac Presentation & Clinical Pathway

¶ 3.3

Presentation

Can cause classic digestive symptoms, but often presents atypically:

- Iron deficiency anaemia
- Tiredness
- Poor growth (children)
- Bone thinning
- Itchy blistering rash

Diagnosis

Step 1:
Specific Antibody Blood Test

Step 2:
Small Intestine Biopsy

[!] **MUST** be done while the patient is still eating gluten.

Treatment

Strict lifelong gluten-free diet

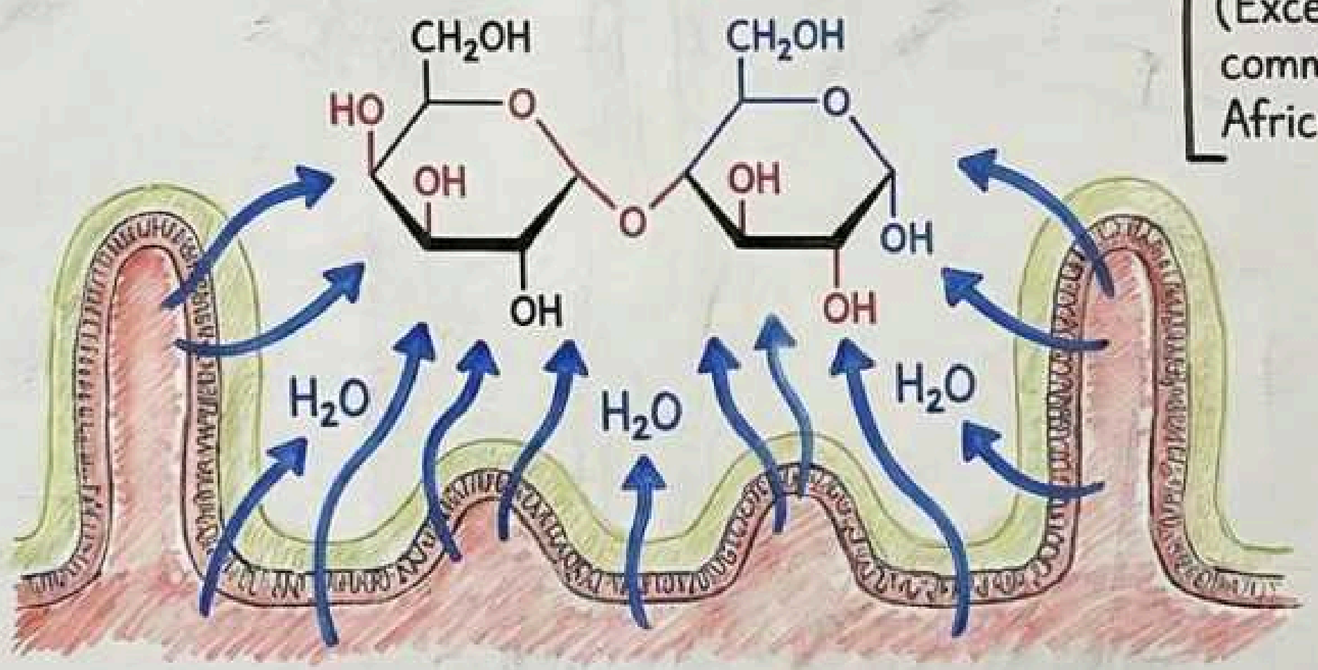
→ Results in villi recovery.

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Lactose Intolerance Mechanics

¶ 3.4

~~Lactase~~



[Epidemiology: Results from post-childhood lactase loss. (Exceptions: Continued production common in N. European and some African/Middle Eastern descent).]

Undigested Lactose in lumen → Osmotic draw of H_2O into gut → Bacterial fermentation ➡ [Symptoms: Bloating, wind, and diarrhoea]

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Mechanisms of Diarrhoea

¶ 3.5

Diarrhoea = Frequent loose or watery stools.

	Osmotic	Secretory
Mechanism:	Unabsorbed substances (e.g., lactose, laxatives) draw H_2O into the gut.	Mechanism: Gut lining actively secretes salt and H_2O.
Response to Fasting:	Stops.	Response to Fasting: Continues.

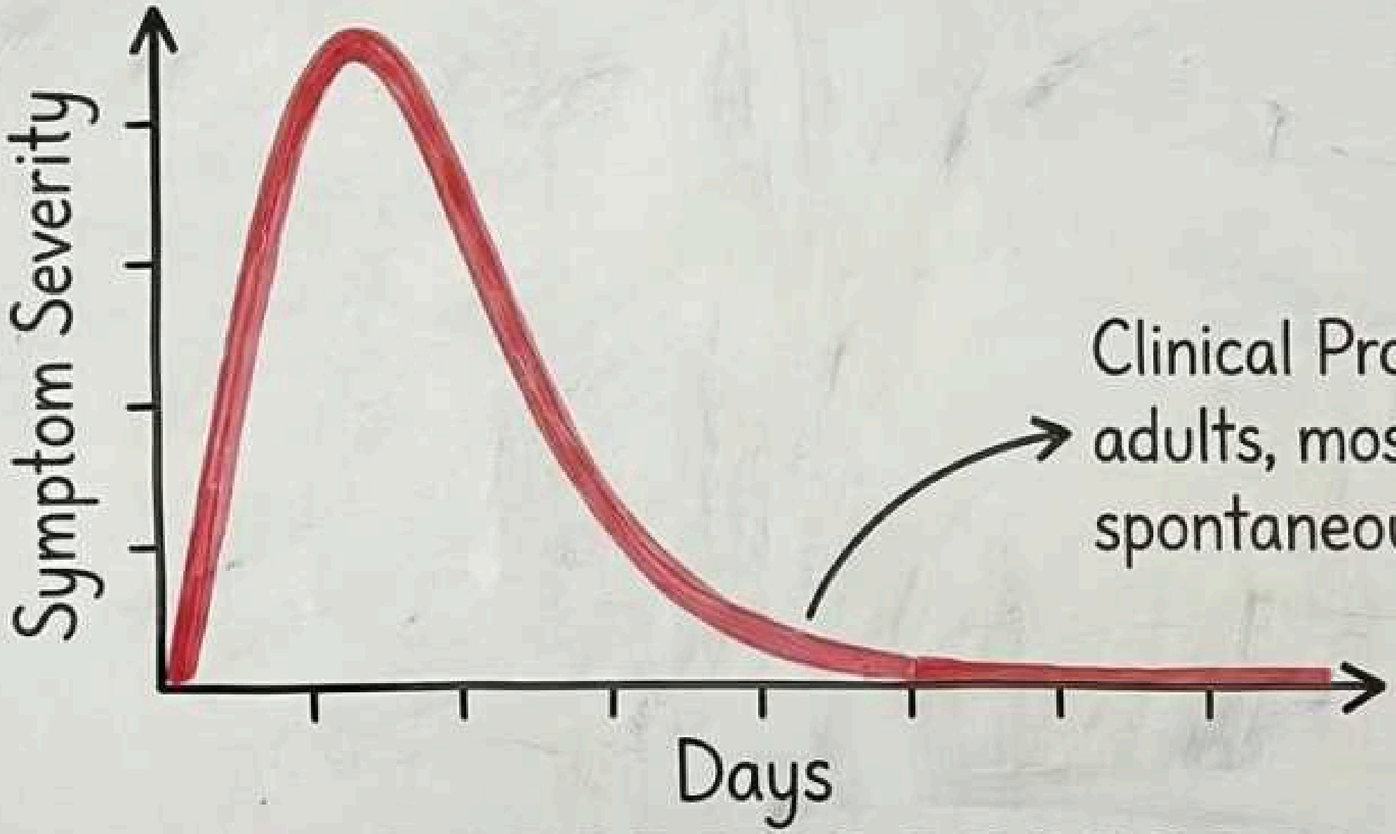
[Other mechanisms include Inflammation and Disturbed motility.]

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Acute Infectious Diarrhoea

¶3.6

Primary Cause: Infections.



Clinical Prognosis: In healthy adults, most cases resolve spontaneously within days.

Curriculum Note: Discussed at a general clinical level only. Detailed microbial pathogenesis is deferred to expert-taught resources in Medicine 512 B, respecting Gary Anderson's policy / Anthropic's guidelines

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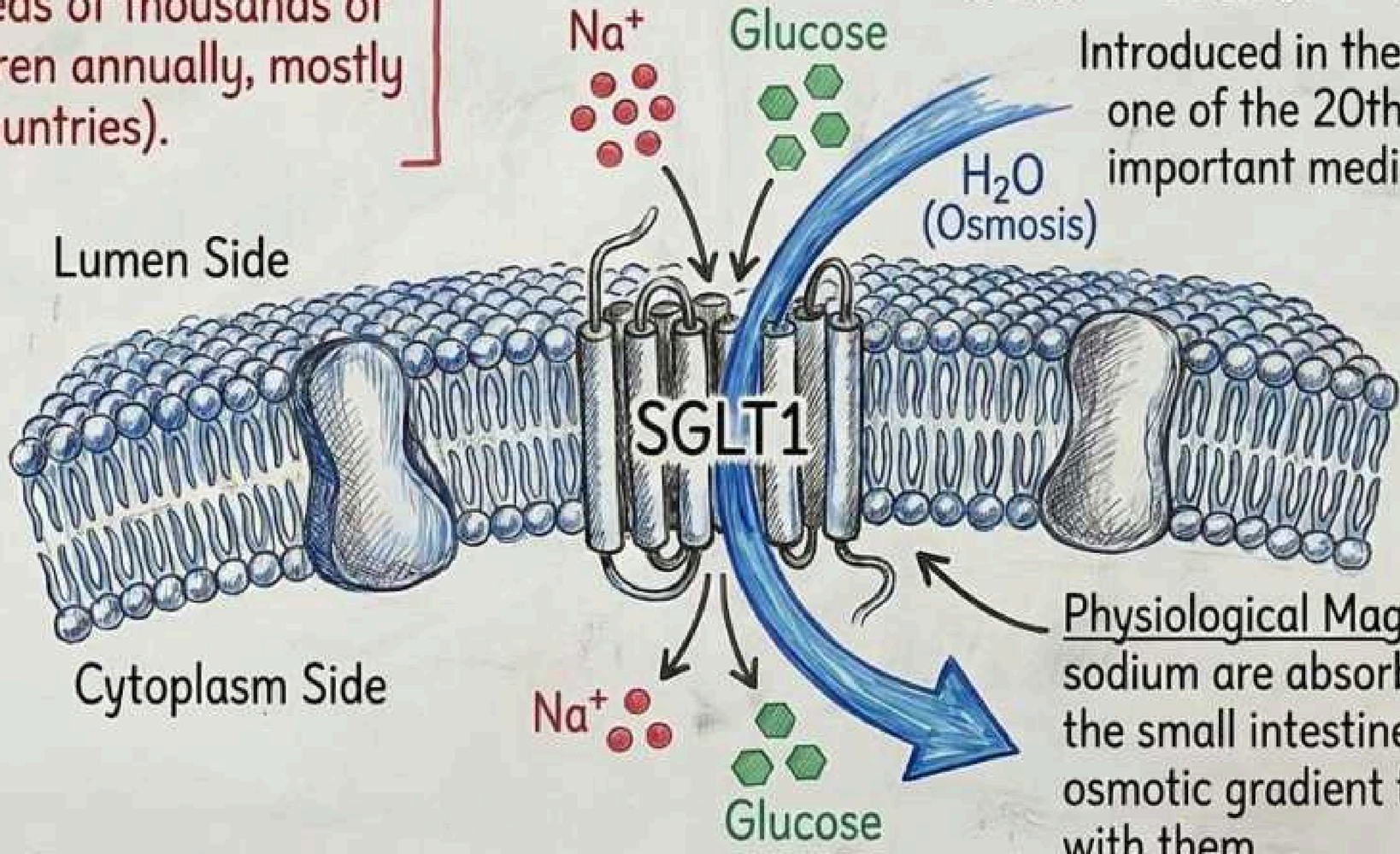
Dehydration & Oral Rehydration Solution (ORS)

¶ 3.7

The Threat: Severe dehydration (kills hundreds of thousands of young children annually, mostly in poorer countries).

ORS = Water + Salt + Sugar

Introduced in the 1970s; hailed as one of the 20th century's most important medical advances.



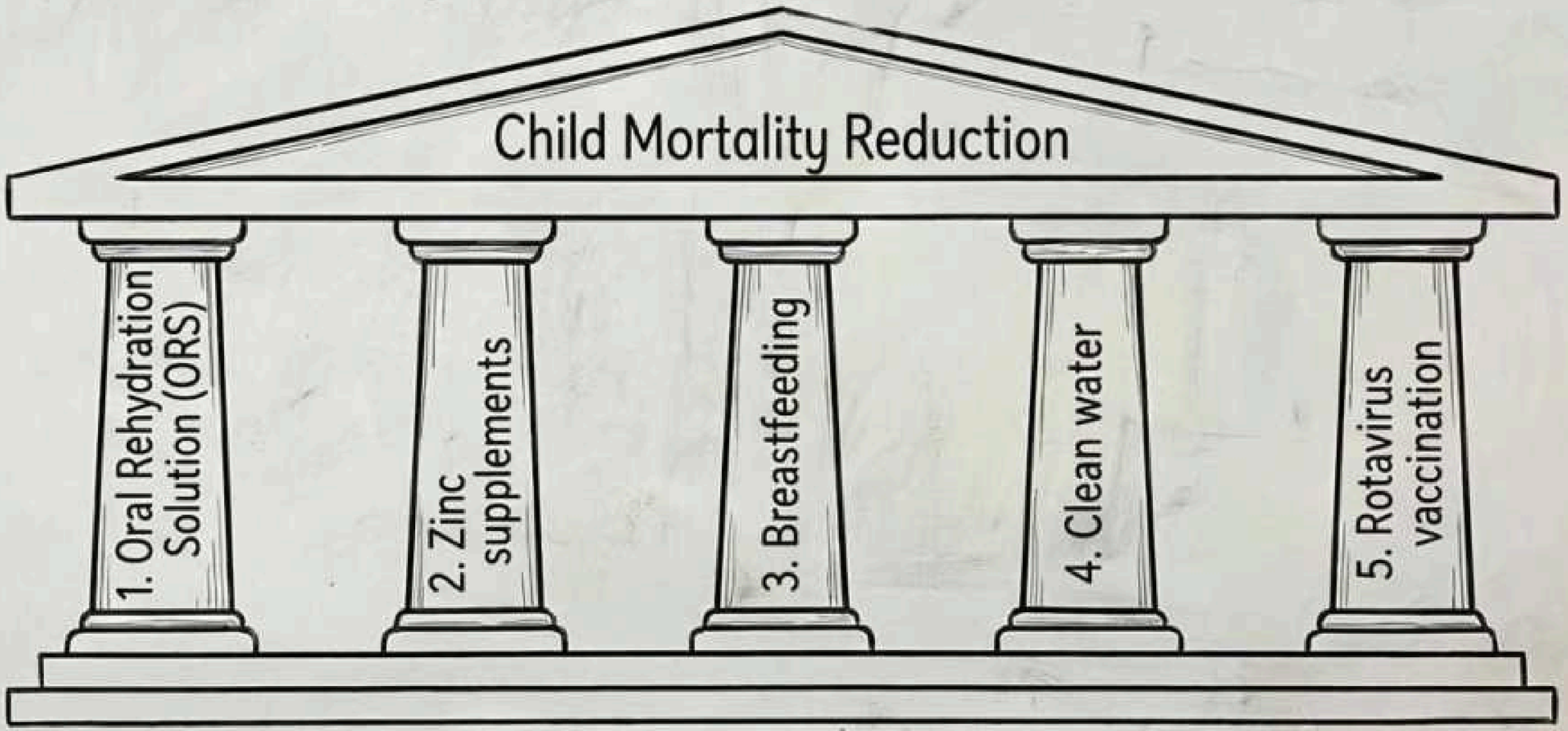
Physiological Magic: Glucose and sodium are absorbed together in the small intestine, creating an osmotic gradient that draws water with them.

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Global Efficacy of ORS & Interventions

¶ 3.8

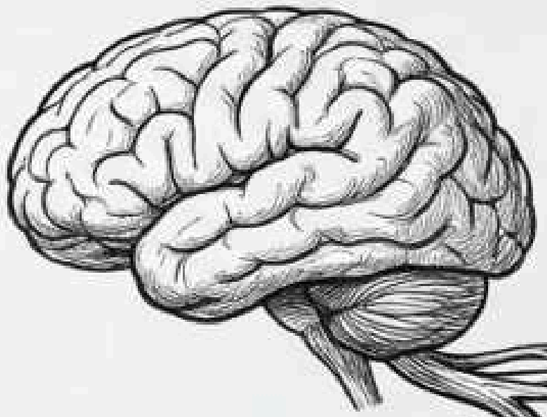
Why ORS works during secretion: Glucose-sodium transporters keep working even when the gut is actively secreting fluid.



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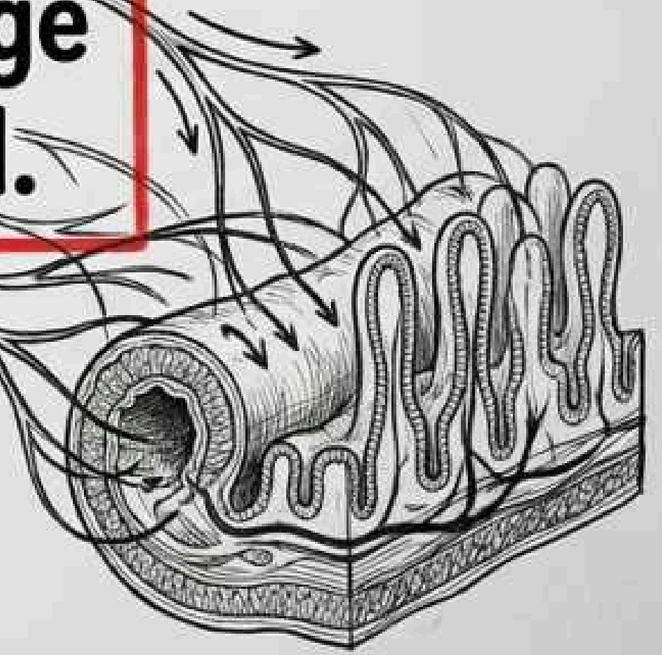
Irritable Bowel Syndrome (IBS) Pathophysiology

¶ 3.9



Mechanism: Disordered gut-brain communication → Heightened gut sensitivity & altered motility.

No structural damage that tests can find.



Clinical Profile: One of the most common gastroenterology presentations.

Core Features: Recurrent abdominal pain linked to changes in bowel habit (diarrhoea, constipation, or both).

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Diagnosing and Treating IBS

¶ 3.10

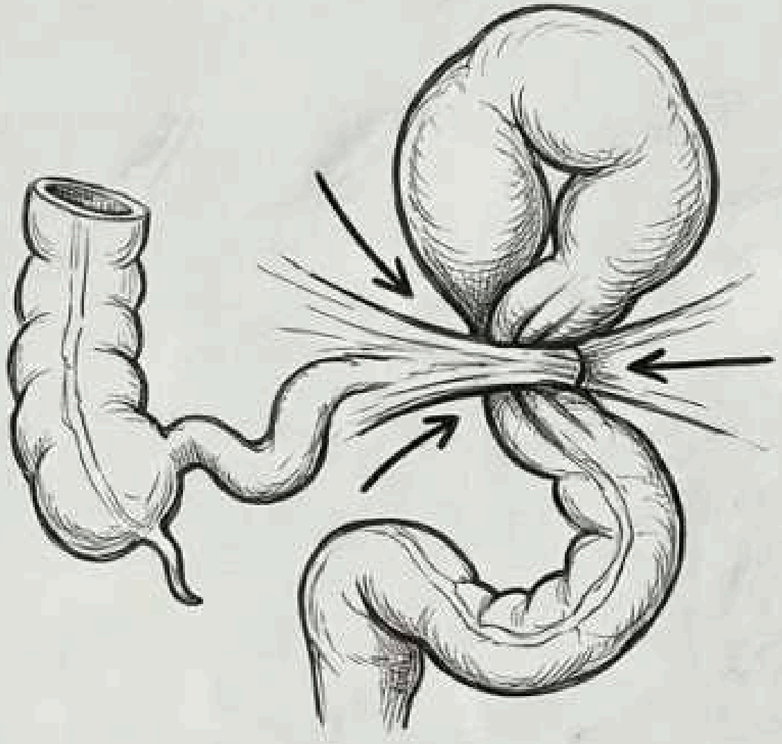
Diagnosis Basis	Red Flags (Requires further investigation) 
Requires typical symptoms + Absence of warning features (no single definitive test exists).	– Bleeding – Weight loss – Anaemia – Symptoms starting in later life – Family history (bowel cancer / IBD)

Treatment Protocol: Explanation & reassurance, Dietary changes, Gut-directed psychological therapies, Medicines targeted at the main symptom.

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Structural & Vascular Emergencies

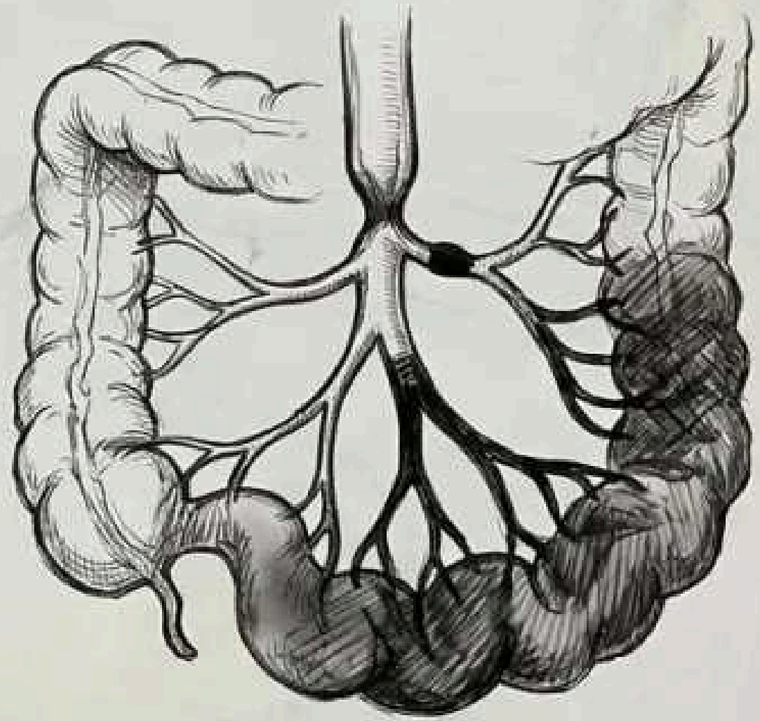
¶ 3.11



Blockage / Obstruction

Causes: Scar tissue from surgery, hernias, tumours.

Symptoms: Cramping pain, vomiting, swelling.



Loss of Blood Supply / Ischemia

Symptoms: Severe pain.

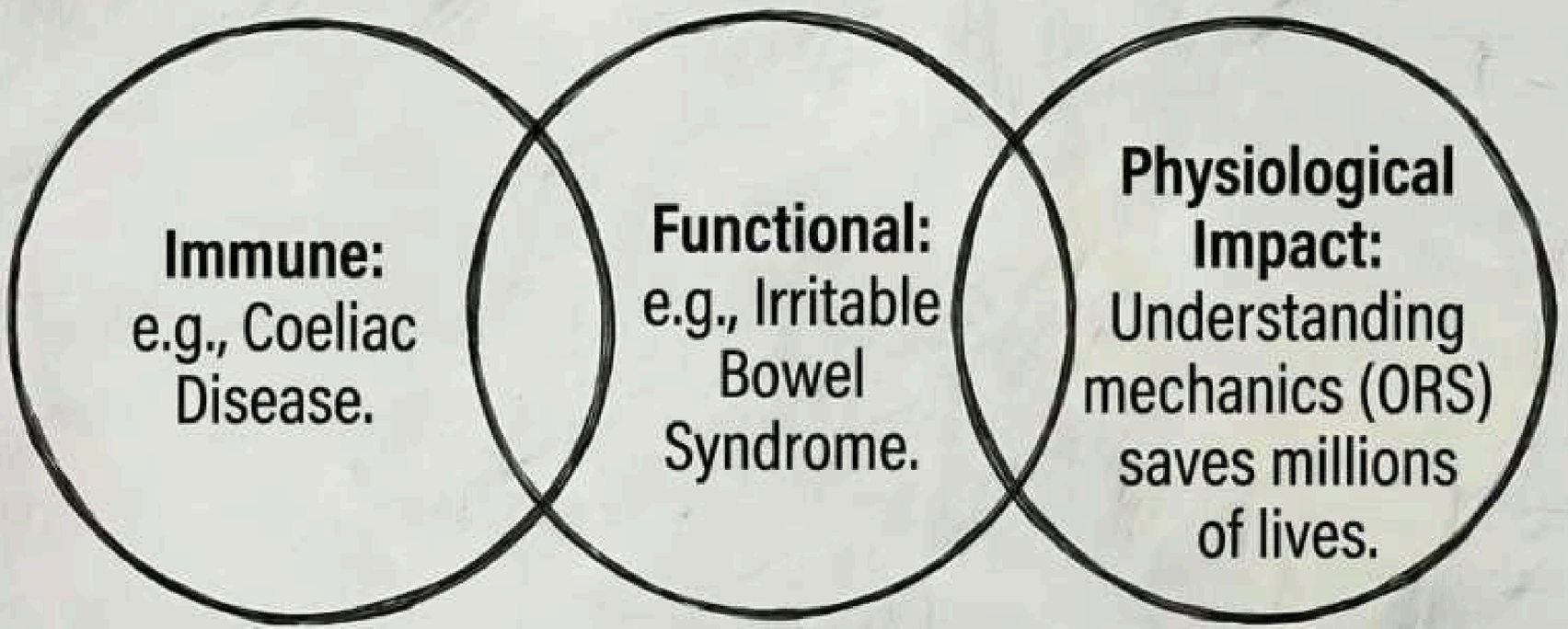
Status: Clinical Emergency (Especially high risk in older people with heart disease).

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Lecture Synthesis & Conclusion

¶ 3.12

Central Role: The small intestine's huge surface area makes it the hub of human nutrition.



Next Lecture
→ The Colon

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