

PHYSIOLOGY OF THE SMALL INTESTINE

PHYSIOLOGY OF THE SMALL INTESTINE

- The principal function of the small intestine is the digestion of food and absorption of nutrients, water and electrolytes. Carbohydrates and proteins are broken down in the intestinal lumen by pancreatic enzymes, but the final hydrolysis takes place at the brush border of the jejunum, after which these nutrients are absorbed. Fats are digested chiefly by the actions of pancreatic lipase and bile salts. The products of fat digestion, fatty acids and monoglycerides, separate from bile salts in the jejunum and are absorbed for further processing. The jejunum is the principal site for digestion and absorption of fluid, electrolytes, iron, folate, fat, protein and carbohydrate, but the absorption of bile salts and vitamin B12 only occurs in the terminal ileum, where there are specific transporters. If the jejunum is resected, the ileum can assume all the required absorptive functions, but resection of the terminal ileum will result in a diminished bile salt pool, vitamin B12 deficiency and may lead to deficiency of the fat-soluble vitamins A, D, E and K. The ileum also plays an important role in water absorption, possibly because the tightness of the intercellular junctions supports a concentration gradient across its lumen. Significant ileal resection therefore commonly results in very troublesome diarrhoea. The small intestine plays an important role in the metabolism of plasma lipoproteins, as it is the main site of synthesis of high-density, low-density and very low-density lipoproteins (HDL, LDL, VLDL). These particles transport most of the absorbed dietary fat to the systemic circulation via the lymph. The small bowel also synthesises intestinal hormones such as glucagon-like peptides GLP-1 and 2, peptide YY and motilin, which interact with the enteric nervous system to modulate intestinal function, growth and differentiation.

Revision #1

Created 2025-12-31 15:27:24 UTC by Omar Ayman

Updated 2025-12-31 15:27:24 UTC by Omar Ayman