SMALL INTESTINE

Three Division
Duodenum (10 inches)
Jejunum (8 feet)
Ileum (12 feet)

1) Villi-finger-like projection
   (Mucosa and Submucosa)
   Increase absorption area 600 x

2) Ileocecal valve-terminal end of ileum at junction of cecum and colon. Controls flow of
   contents into large intestine, prevents reflux into ileum.

3) 90% of nutrients and 50% H₂O and Electrolytes are absorbed in jejunum (NG⁺ K⁺ C1⁻
   HCO₃⁻ MgH PO₄³⁻)

4) Water-soluble vitamins (C&B complex) absorption occurs in all parts of small intestine

   1) Iron-uptake all areas

   2) Vitamin B12 requires intrinsic factor absorbed in ileum

   3) Fat-soluble vitamin (A,D,E,K) require bile salts absorbed in jejunum

   4) Ca++ requires Vitamin D absorbed in duodenum

LARGE INTESTINE

Division
Cecum
Ascending Colon
Transverse Colon
Descending Colon
Sigmoid Colon
Rectum

Two Flexures
Hepatic
Splenic

Two Sphincters
Ileocecal
Anal
FUNCTION – ABSORPTION OF:

1) \( H_2O \) + Electrolytes
   \( NA^+ \) and \( Cl \) absorbed
   \( K^+ \) and \( HC0_3 \) secreted

2) Urea breakdown – blood urea metabolic waste product is broken down to \( NH_3 \) by mucosal cells of colon

3) Bacteria breakdown cellulose and synthesize vitamins (folic acid, riboflavin, vitamin K, Nicotinic acid)

4) Factors that enhance colonic motility
   High residue diet
   Irritation of colon

5) Factors that inhibit, motility
   Low residue diet
   Anticholinergic drugs-Atropine, Propantheline

GALL BLADDER

! Serves as passageway for bile
! From liver intestine
! Regulates bile flow
! Collects conc. and stores bile
! Bile responsible for emulsification of fats
! Major bile pigment is bilirubin
! Bile moves form liver canaliculi

----> Hepatic duct -----> cystic duct to G.B. for storage

Stimulation GB secretes bile into cystic duct -----> common duct -----> duodenum
PANCREAS

Pancreatic duct joins common bile duct before entrance into duodenum – Ampulla of Vater

Pancreatic secretion

A. Exocrine
   Acinar cells secrete a high Concentration of NaHc0₃ H₂0 Ha⁺ K⁺ and digestive Enzymes (Lipase, Amylase, Trypsin, Ribonuclease)

B. Endocrine
   Beta cells secrete insulin
   Alpha cells secrete glucagon

C. Control of secretion
   1. Vagal-parasympathetic impulse result in moderate secretion of pancreatic enzymes during cephalic and gastric phases
   2. Hormonal-entrance of food into small intestine stimulates pancreatic secretions via hormonal influence (secretion, cholecystokinin)

LIVER DYSFUNCTION

Edema due to hypoalbuminemia results from Hepatic production of serum Albumin

GI, bleeding, bruising, nosebleed, bleeding wounds form inability of liver cells to use vitamin K, A, D, E

Abnormal glucose metabolism.
Hyperglycemia after meals and hypoglycemia after fasting because hepatic glycogen reserves and gluconeogenesis

Decrease metabolization of Drugs

Decrease metabolism of estrogen ----> gynecomastia testicular atrophy, loss of pubic hair, menstrual irregularities spider angiomata, reddened palms

Bilirubin not converted into urobilin regurgitated back into blood