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M1 - GI Sequence
(GI/Liver)

Sequence Coordinator
Matthew Velkey

Winter, 2007
Digestive System

Gastrointestinal Tract

Oral cavity - Anus

Accessory Glands

Salivary Glands
Liver
Pancreas
GI Tract

Mucosa
- Epithelium (glands)
- Lamina propria
- Muscularis mucosae

Submucosa (glands)

Muscularis Externa
- Inner circular (Myenteric plexus)
- Outer longitudinal

Serosa or adventitia
Nerves (and arteries) of the GI Tract
Digestion

Ingestion
Mechanical Processing
Chemical Digestion
Absorption
Compaction and Removal of indigestible residue
Portal Circulation

- Hepatic portal vein
- Superior mesenteric vein
- Inferior mesenteric vein
- Splenic vein

Gray’s Anatomy Plate 591, Wikipedia
Major Functions of the Liver

Bile formation and secretion
Plasma protein synthesis and secretion

Maintenance of normal blood glucose, amino acid and fatty acid concentrations
Carbohydrate metabolism
Lipoprotein synthesis and secretion
Metabolism of steroids, including synthesis and release of cholesterol

Metabolism of lipid soluble drugs and detoxification
GI Sequence Contents

1. **Structure, Function and Regulation of the GI Tract**
   - Formation and Development
   - Anatomy and Histology
   - Functional Physiology and Regulation

2. **Metabolic Interaction**
   - Metabolism of CHO, Lipids, Proteins, Cholesterol, etc.

3. **Pharmacology**
   - Drug Disposition and Metabolism
Sequence Contents: Structure

Development
  Anatomy module: Gut formation and rotation

Structure
  Anatomy:
    Stomach
    Duodenum, Pancreas, Liver and Biliary System
    Small and Large Intestines
  Anatomy modules:
    Abdominal viscera, Autonomic innervation, and Radiology

Histology:
  Oral Cavity and Salivary Glands (Kim)
  GI Tract - Pharynx, Esophagus and Stomach (Velkey)
  Pancreas, Liver and Gall bladder (Kim)
  GI Tract - Small and Large Intestines (Velkey)
Sequence Contents: Physiology

Functions and Regulation of GI Tract (Williams)
1. Nerves and Hormones
2. Salivary glands, Esophagus and Stomach
3. Stomach and Pancreas
4. Pancreas and Bile
5. Liver/Integration
6. Digestion and Absorption
7. Absorption and Motility
8. Colon/Integrative Review

Physiology Small Group

Nutrition and GI microbiology (Williams, Burant, and Abrams)
1. Macronutrients (Burant)
2. Micronutrients (Williams)
3. GI microbial flora - host relationship (Abrams)
Sequence Contents: Metabolism

Metabolic Interaction (Weinhold)

1. Hormonal control
2. Glucose/Fructose/Galactose/Gluconeogenesis
3. Gluconeogenesis
4. Overall Regulation
5. Glycogen
6. Glycogen regulation
7. Fatty acid oxidation/ Ketone bodies
8. Triglycerides/phospholipids
9. Cholesterol/Lipoproteins
10. Adipose
Sequence Contents: Pharmacology

Since most drug therapy is oral, the gastrointestinal tract plays a crucial role in drug absorption metabolism and pharmacokinetics.

**Pharmacology (Osawa):** Introduces the basic principles that govern absorption and metabolism of drugs.

Drug Disposition
Drug Metabolism I, II and III
Textbooks

In addition to those recommended earlier,

1. Gastrointestinal Physiology by Kim E. Barrett
   published by Lange (McGraw Hill) 2006


Both should be viewed as supplementary and the lectures will not follow them directly but they cover the material. They are both paperbacks.
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