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M1 - GI Sequence

(GI/Liver)

Sequence Coordinator

Matthew Velkey

Winter, 2007



Digestive System

Gastrointestinal Tract

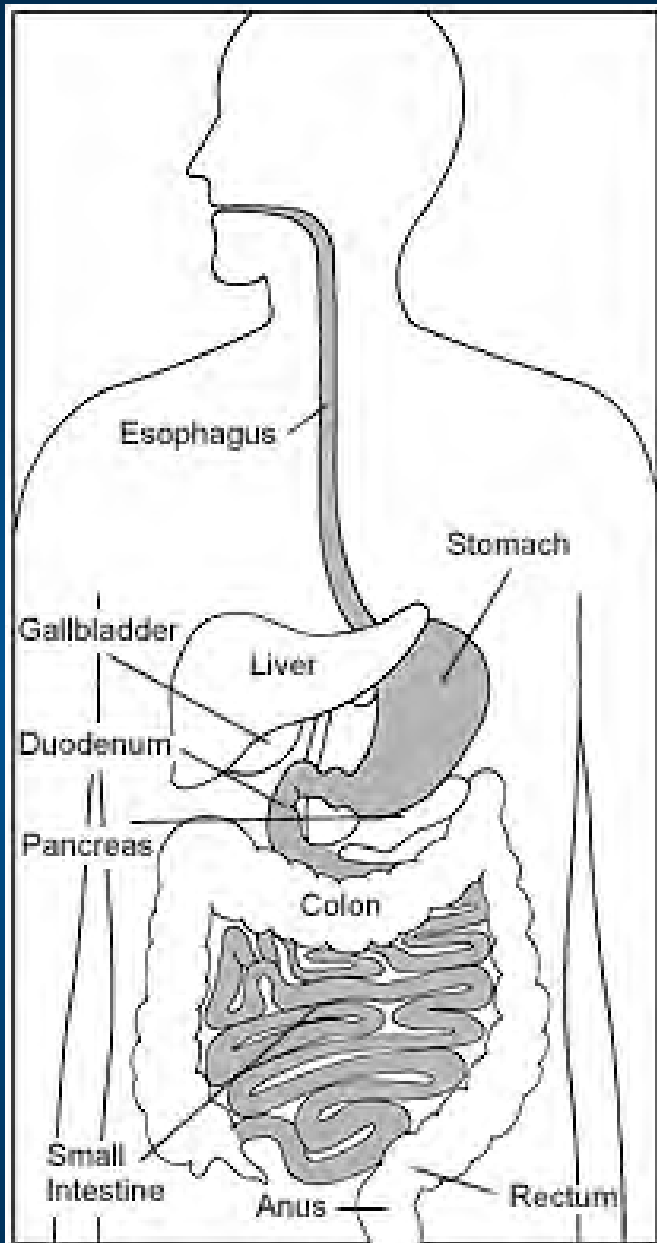
Oral cavity - Anus

Accessory Glands

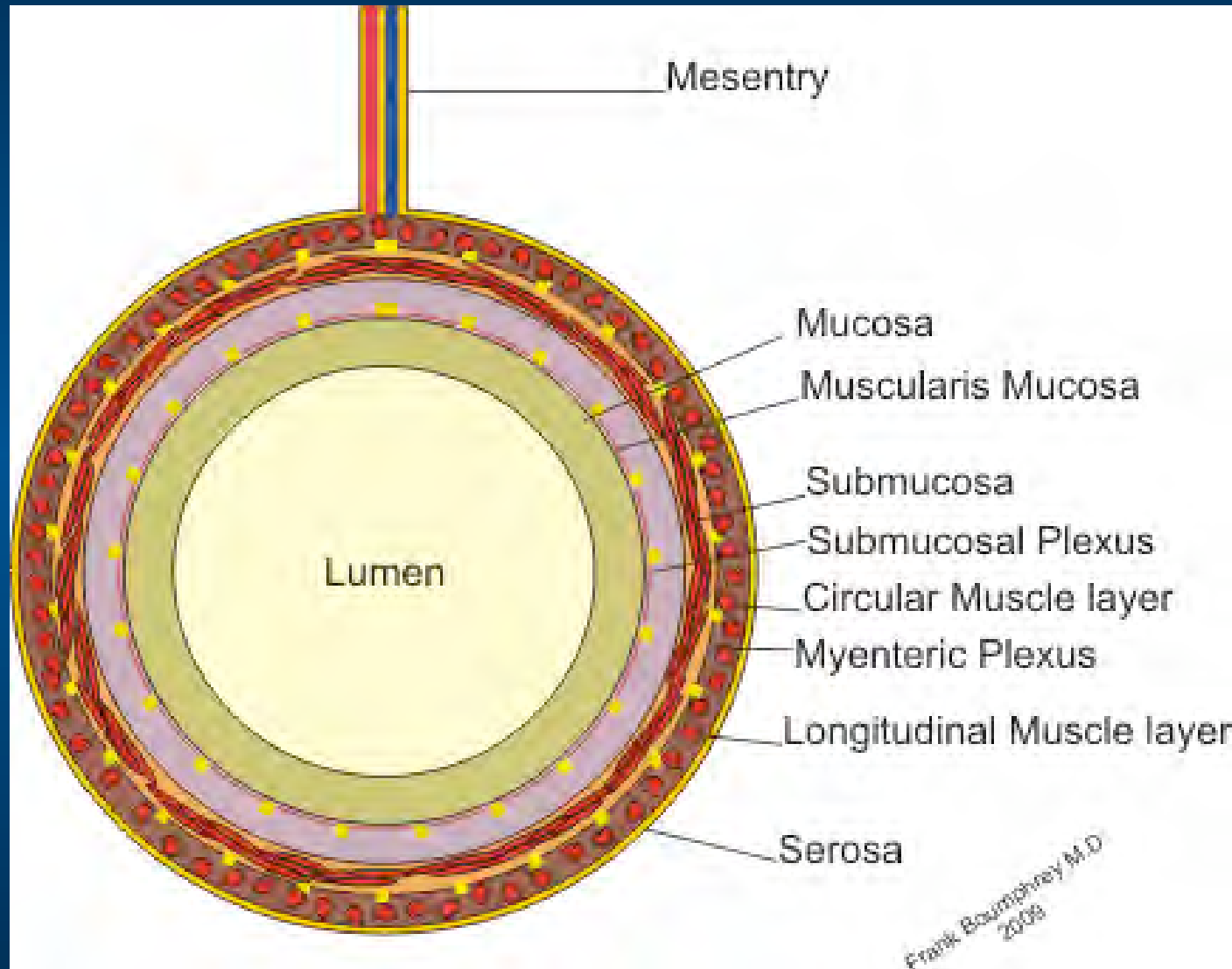
Salivary Glands

Liver

Pancreas



GI Tract



Mucosa

- Epithelium
(glands)
- Lamina propria
- Muscularis mucosae

Submucosa

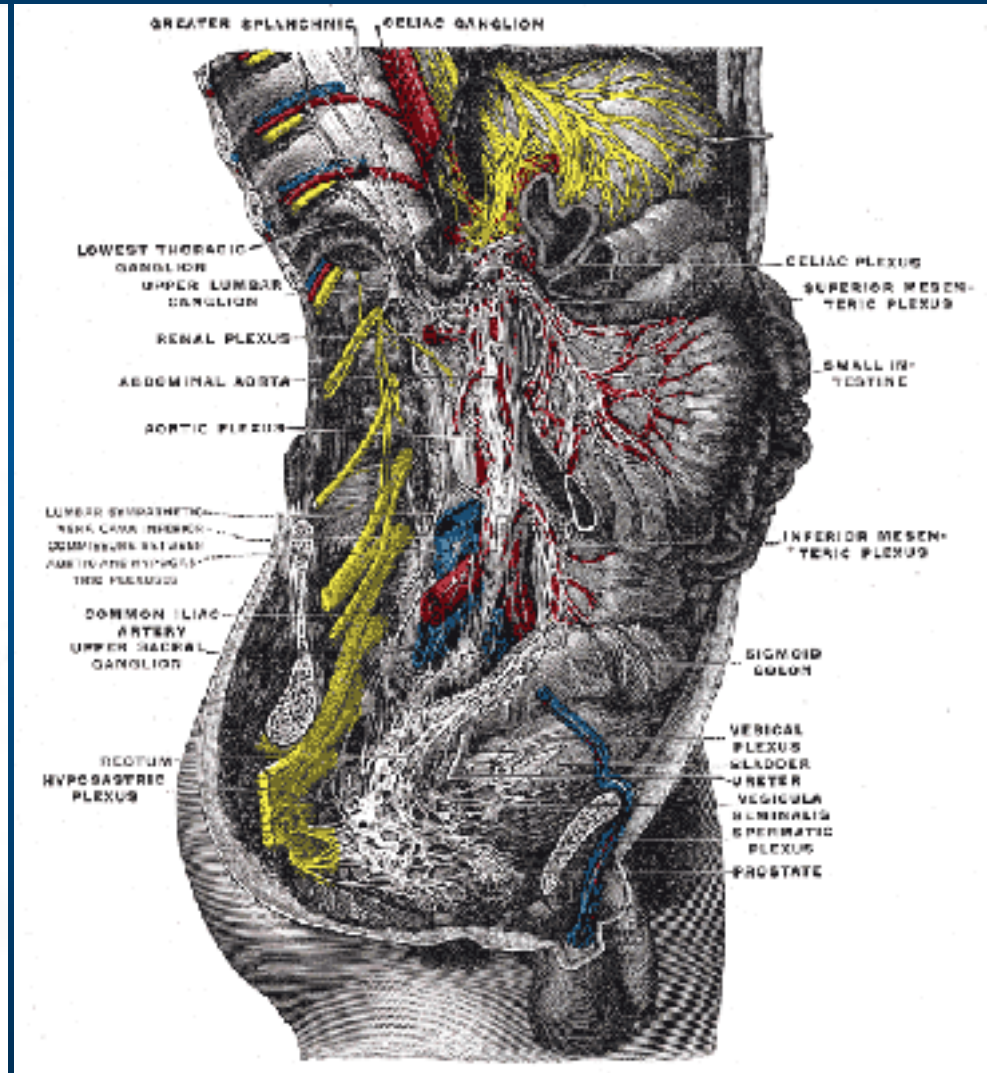
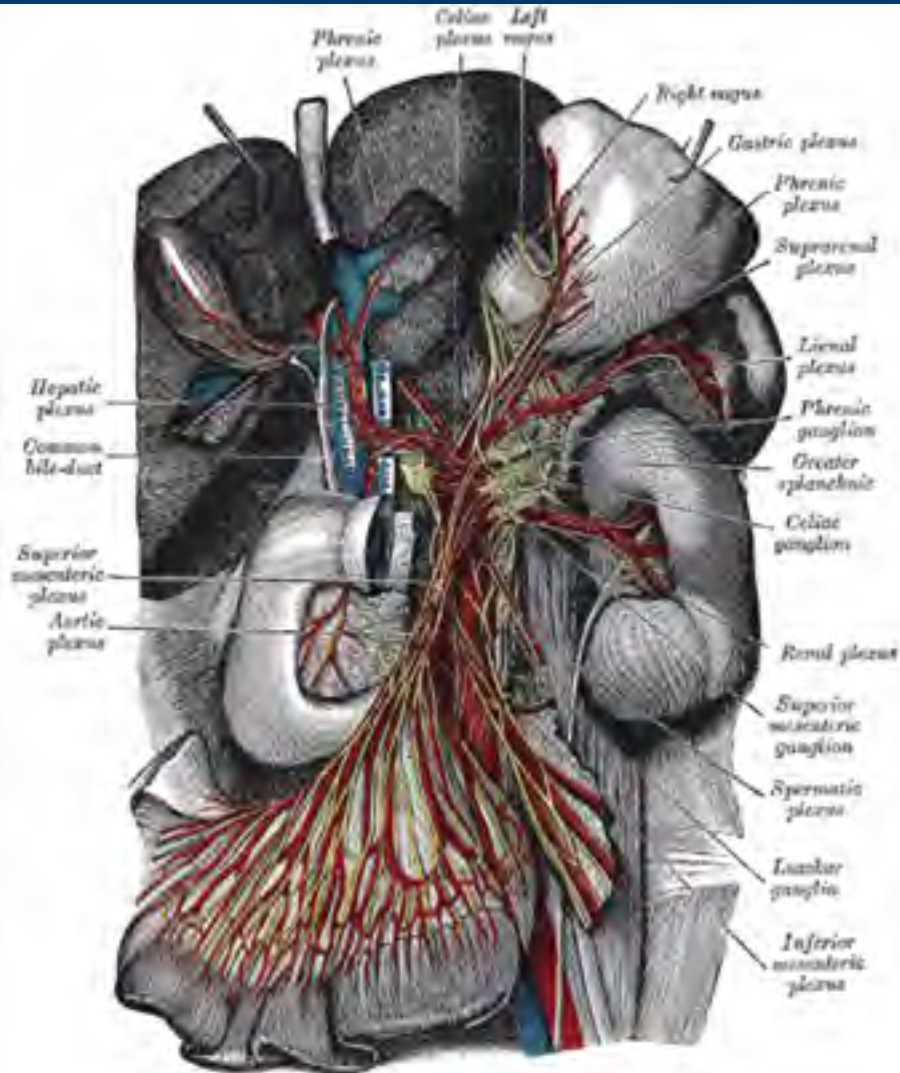
(glands)

Muscularis Externa

- Inner circular
(Myenteric plexus)
- Outer longitudinal

Serosa or adventitia

Nerves (and arteries) of the GI Tract



Digestion

Ingestion

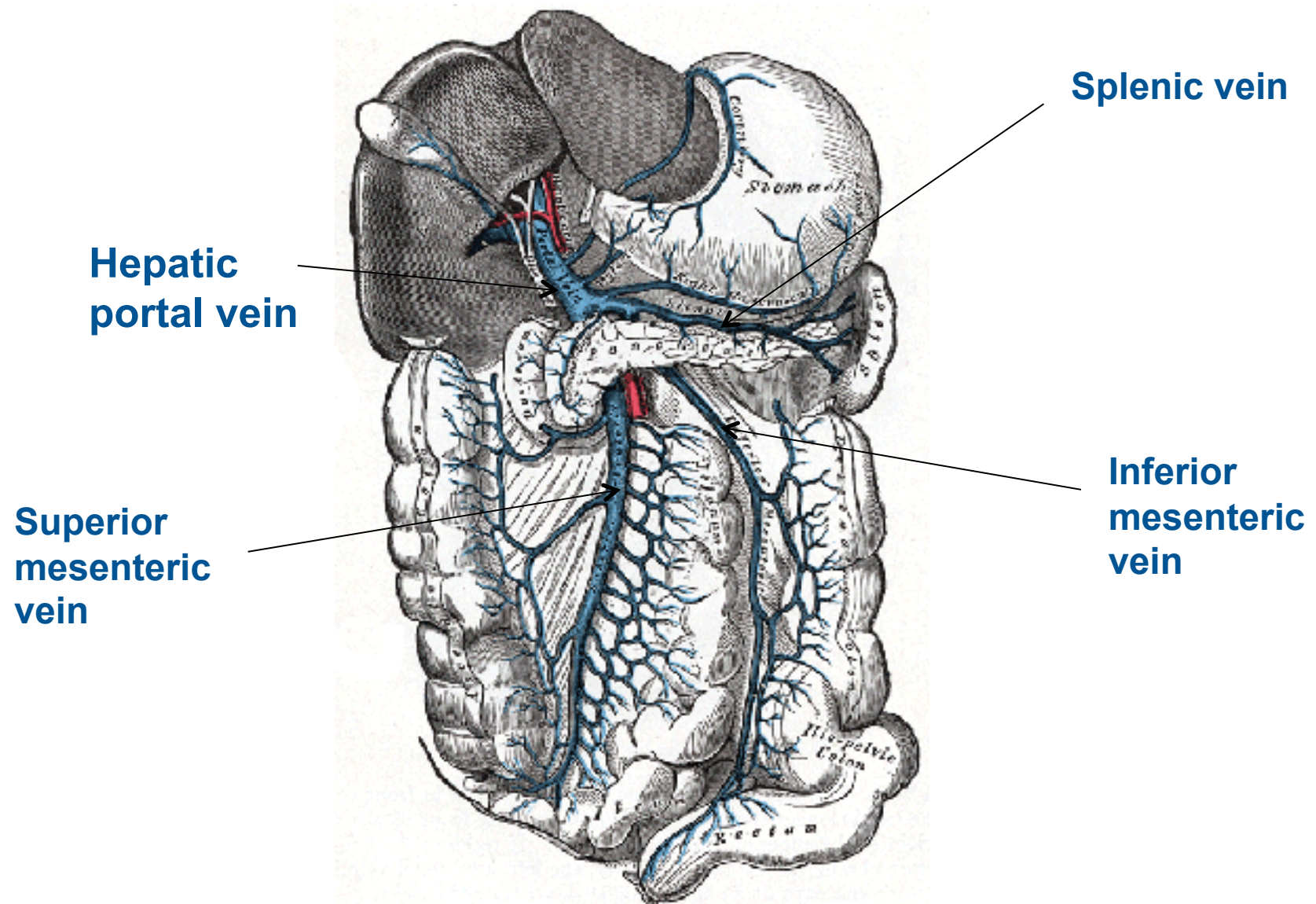
Mechanical Processing

Chemical Digestion

Absorption

**Compaction and Removal of
indigestible residue**

Portal Circulation



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
2. Gastrointestinal Physiology, 7th edition, by Leonard R. Johnson published by Mosby, An Affiliate of Elsevier, 2007.

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

Additional Source Information

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Slide 4: National Digestive Diseases Information Clearinghouse, [US Federal Government](http://digestive.niddk.nih.gov/ddiseases/pubs/uppergi/index.htm),
<http://digestive.niddk.nih.gov/ddiseases/pubs/uppergi/index.htm>

Slide 5: Boumpfreyfr, Frank Boumpfrey, M.D., Wikipedia,
http://commons.wikimedia.org/wiki/File:Smallintestine_layers2.png

Slide 6: Gray's Anatomy Plate 848, Wikipedia, <http://commons.wikimedia.org/wiki/File:Gray848.png>; Gray's Anatomy
Plate 849, Wikipedia, <http://commons.wikimedia.org/wiki/File:Gray849.png>

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