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Introduction

Introduction to M2 GI Sequence
Rebecca W. Van Dyke, MD

Winter 2012
Industry Relationship Disclosures

Industry Supported Research and Outside Relationships

• None
Learning Objectives

1. Students will describe tools to evaluate the GI tract.

2. Students will view endoscopic pictures and videos (available on line) as a tour of the GI tract.

3. Students will describe specialized forms of endoscopy (capsule endoscopy, double-balloon endoscopy)

4. Students will describe principles of GI motility from educational video on the subject which they will view on line.
The GI Tract: Multiple organs and endogenous flora (bacteria)
Address to a Haggis
Robert Burns

Fair fa’ your honest sonsie face
Great chieftain o’ the pudding race…

The groaning trencher there ye fill
Your hirdies like a distant hill…..

But mark the Rustic, haggis-fed
The trembling earth resounds his tread……

Ye Pow’rs wha mak mankind your care;
And dish them out their bill o’fare
Auld Scotland wants nae skinking ware That jaups in luggies;
But, if ye wish her gratefu’ prayer, Gie her a haggis!

Robert Burns, “Address to a Haggis,” 1786.
Course Information

- Course content/MDC
- Syllabus and information about the course
- Web sites for additional materials
- Introduction to Gastroenterology
- Morning question/problem periods
Your syllabus has the complete course schedule and it is also posted on-line.

Please check for your small group and pathology lab assignments as well.

We will work through modules:
1. Stomach/esophagus: esophagitis, peptic ulcer disease
2. Motility disorders of the tubular GI tract
3. Small intestine/colon: diarrhea, inflammatory bowel disease, cancer
4. Abdominal pain
5. Liver physiology and disease
6. GI cancers: pancreatic, colorectal
7. Pancreatic disease
8. GI bleeding and miscellaneous topics
9. Nutrition
10. Introduction to ENT (otolaryngology)
Web-Based Information

- PowerPoint presentations of lectures are available on-line as are streaming videos.
- Copy of GI Pathology lab syllabus will also be put on on-line.
- Copy of Pathology Slide Guide is found at:
  - [http://www.med.umich.edu/lrc/students/m2/gastrointestinal/index.html](http://www.med.umich.edu/lrc/students/m2/gastrointestinal/index.html)
GAS608 Final Exam
(3 hour course exam and 1 hour pathology exam)

Online access Friday Feb 10, 5:00 p.m. – Sign-on deadline for both exams: Sunday Feb 12, 10:00 p.m..

Queries due by during the week after the exam. Exact times will be posted.
Tools for Evaluating the GI Tract

Capsule endoscopy

Endoscopy
- Biopsy
- Endoscope

Radiology
Dr. Basil Hirschowitz and an early fiberoptic endoscope at the University of Michigan
Tour of the Lumen of the Tubular Gastrointestinal Tract: Structures Within Reach of the Endoscope

A Lumen with a View
Normal Vocal Cords

Entrance to esophagus

Vocal cord
Normal Esophagus
A Funny Thing Happened on the Way to the Stomach

Meatball is stuck

Spaghetti in Esophagus
Retroflex View of Gastro-esophageal Junction from inside the stomach
Normal Stomach
Large rugal folds of proximal stomach (fundus)
Normal Distal Stomach/Antrum
Strange Encounters of the Endoscopic Kind
Normal Antrum (foreground) and Pylorus
Normal Duodenum
Not distended so valvulae conniventes appear thickened
External View of Normal Anus
Retroflex View of Anus/Anal Sphincter from inside the colon
Normal Rectum
prominent vasculature
Sigmoid Colon
Descending Colon (left side)
Splenic Flexure of Colon
Pill in the Colon
Transverse Colon
characteristic triangular folds
Transverse Colon
Hepatic Flexure of Colon
Ascending Colon (right side)

Haustral Folds
Cecum

Ileocelecal Valve
Close-up of Ileocecal Valve in the Cecum
Ileum as viewed after passing through the ileocecal valve from the colon
Endoscopy

- View from mouth to mid-duodenum
  - Upper endoscopy
  - EGD = esophagogastroduodenoscopy
- View from anus to cecum/terminal ileum
  - Lower endoscopy
  - Colonoscopy
- What does this leave?
  - Small bowel
  - Capsule endoscopy
Extent of esophagogastroduodenoscopy

Extent of push endoscopy (80-120 cm past ligament of Trietz). Uncomfortable and time-consuming.

Capsule can be used to easily visualize rest of the small intestine.

Extent of colonoscopy
Inside the capsule:
1. Optical dome
2. Lens holder
3. Lens
4. Illuminating LEDs (Light Emitting Diodes)
5. CMOS (Complementary Metal Oxide Semiconductor) imager
6. Battery
7. ASIC (Application Specific Integrated Circuit) transmitter
8. Antenna
Double Balloon Endoscopy

Figure 2. Double balloon enteroscopy. The drawings above show the technique of “push and pull enteroscopy” using the double-balloon enteroscope with overtube to facilitate examination of the SB.
Capsule Views
normal small bowel

Lymphoid hyperplasia
Capsule Views Diseases

Ulcers from Crohn’s disease or non-steroidal anti-inflammatory Drugs (NSAIDs)
Capsule Views Disease

Bleeding

Arteriovenous Malformation (AVM)

Stricture (NSAIDs)
Further images and endoscopic videos of GI/Liver diseases

- [daveproject.org/](http://daveproject.org/)

- This is a free website established and updated by gastroenterologists and sponsored by the American Society of Gastrointestinal Endoscopists and one of the endoscopy equipment manufacturers

- Feel free to wander…….
Videos

- Animations of upper and lower endoscopy
- Examples of normal endoscopy – these will be posted on CTools
- GI motility video – physiology and pathophysiology. This is about 30 minutes in regular speed. It is on CTools and I suggest you watch it at the usual 1.5-2x speed.
Additional Source Information
for more information see: http://open.umich.edu/wiki/CitationPolicy


Slide 12, Image 3 (left, bottom): jcjack, "Radiology 2-R," Flickr, http://www.flickr.com/photos/48497052@N04/5058467485/#/, CC: BY 2.0, http://creativecommons.org/licenses/by/2.0/deed.en