



An Overview of General GI Endoscopic Procedures

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Introduction



Gastroenterology is a branch of medicine that focuses on the digestive system and its disorders.

Endoscopic procedures are performed for both diagnostic and therapeutic purposes to further evaluate a patient.

The three of us researched about the various GI endoscopic procedures to obtain a better understanding of the “scope” of this medical specialty.



Anatomy of GI Tract

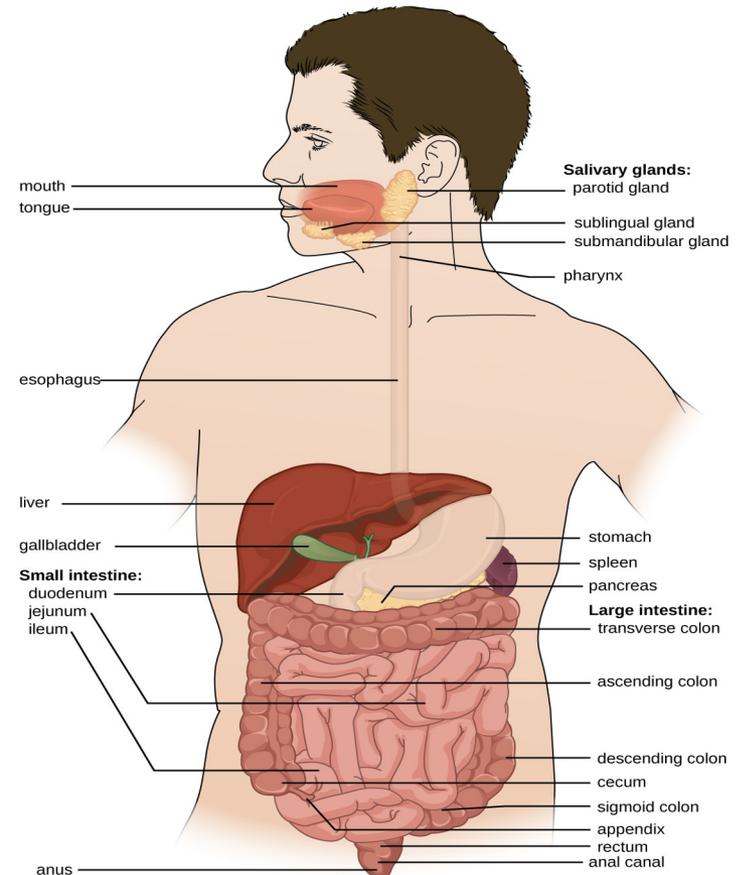
Gastrointestinal Tract



A hollow tube that starts from the oral cavity connecting the pharynx, esophagus, stomach, small intestine, colon and the anus

- Small intestine: duodenum, jejunum, and ileum.
- Colon: cecum, ascending, transverse, descending, sigmoid colon and rectum.

Main function: to break down food in order to absorb nutrients.



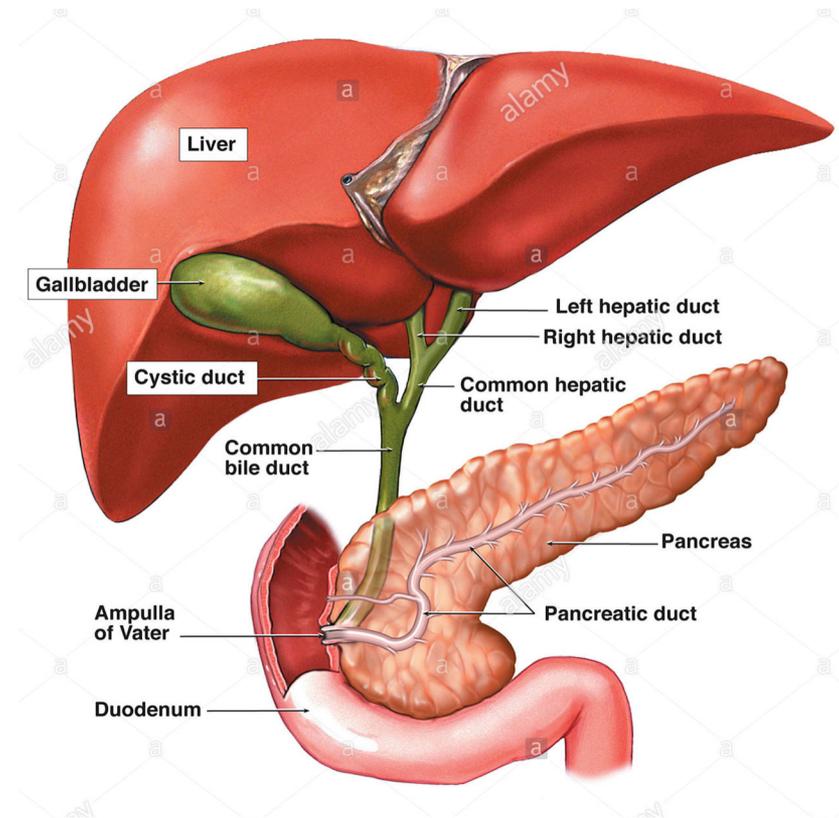
Liver and Hepatobiliary Tract



Liver functions to detoxify blood and produce bile needed for digestion.

System of ducts coalesce from the liver to form the common bile duct.

Cystic duct from the gallbladder joins the common bile duct and empties into the duodenum.





Types of Endoscopic Procedures

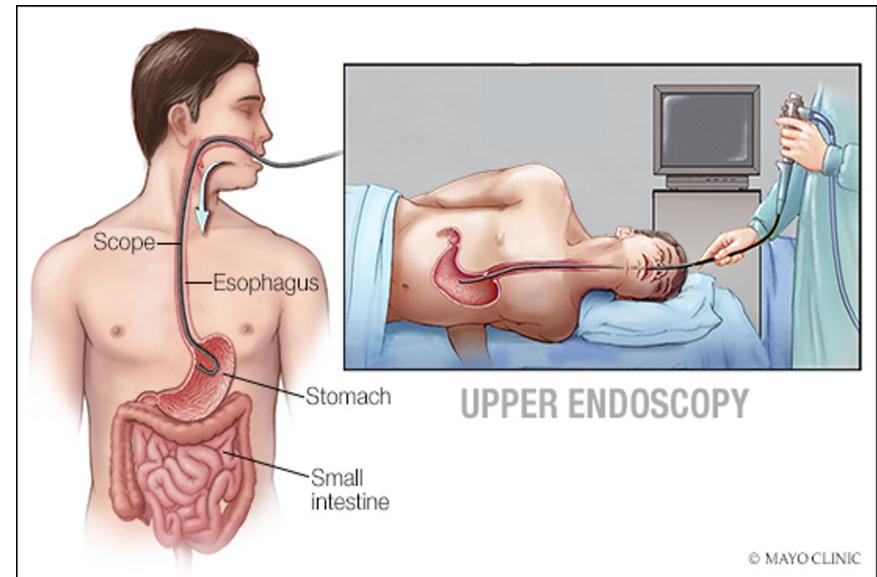
Upper GI Endoscopy (EGD)



(Esophagogastroduodenoscopy)

Visualization of the esophagus, stomach, and proximal duodenum.

Allows for a real-time diagnostic and therapeutic evaluation of the upper GI tract.





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Examines the biliary and pancreatic ducts.

A special type of scope is inserted from the mouth into the proximal duodenum and a catheter is inserted into the biliary system through the ampulla.

Contrast dye is injected into the bile duct, liver ducts and pancreatic ducts as needed and fluoroscopic videos are taken.

Various maneuvers including stone extraction, stent placement, etc... may be performed.



ثم نحقق مادة قبايينية للحصول على صور للقناة الصفراوية

Small Bowel Enteroscopy



Used to examine the small intestine more deeply.

Uses a long endoscope with either one or two balloons fitted onto the end of the tube.

The endoscope is advanced by inflating and deflating the balloon(s).

A very difficult procedure.

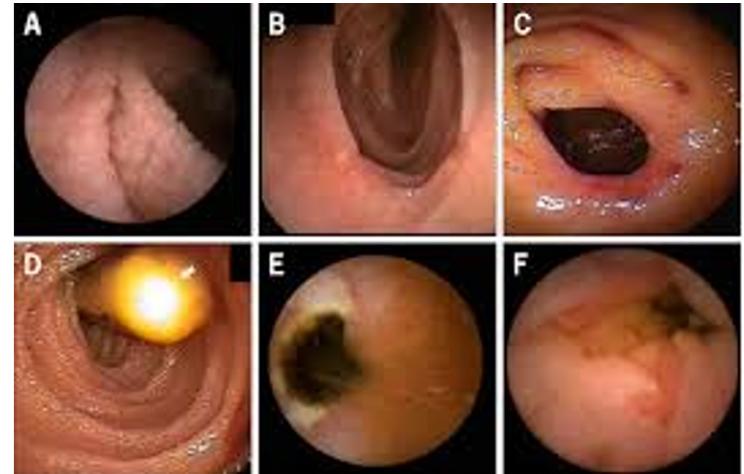
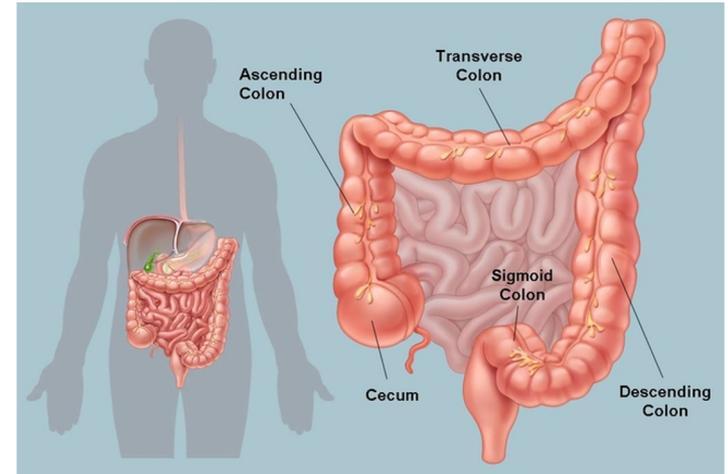
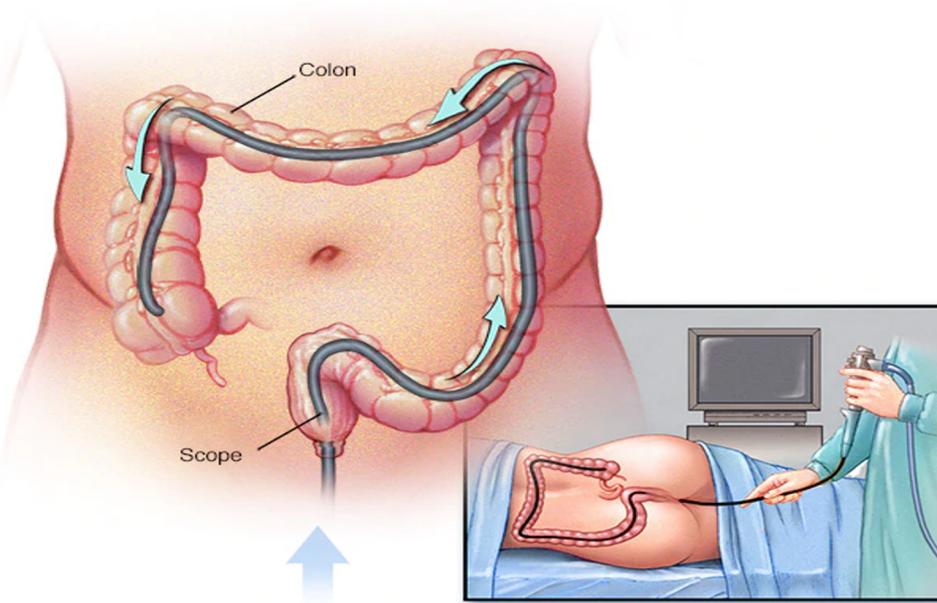


Figure 2. Small bowel endoscopy and enteroscopy: basic and advanced techniques. Hoffmann

Colonoscopy



Endoscopic examination of rectum, colon and limited portion of the terminal ileum.





normal colon





normal colon



normal colon





Indications for Procedures



Evaluate upper GI symptoms:

- nausea/vomiting, atypical chest pain, abdominal pain.

Evaluate abnormalities noted on UGI radiology studies:

- strictures or inflammation, ulcers, tumors, hernias, diverticula, etc...

Surveillance of chronic conditions:

- GERD and Barrett's esophagus.

Therapeutic Interventions of the Upper GI Tract



Biopsy of any abnormal appearing tissue.

Treatment of bleeding conditions.

Removal of foreign bodies.

Placement of feeding tube (PEG).

Stent placement (benign or malignant conditions).

Dilation of narrowed areas (esophageal strictures, etc...).

Management of operative complications - leaks after surgery, etc...

Indications for Colonoscopy



Detection and removal of polyps

Treatment of lower GI bleeding

Treatment of strictures/obstructions

Colonic decompression

Foreign body removal



Preparation

Bowel Preparation



Allows for visualization of the GI tract.

- EGD: requires a period of fasting to ensure that the stomach is empty of food to allow for examination while reducing risk of aspiration into the lungs.
- Colonoscopy: Fasting the day before drinking only clear liquids with a bowel purge with laxatives required to allow examination of the colon.

Specific instructions are given by the physician



Patients need to take most of their usual medications prior to their procedure (especially blood pressure and cardiac medications) with a small sip of water.

Anti-inflammatory medications are generally held for 1 week prior.

- Aspirin, ibuprofen, naproxen, meloxicam

Anticoagulants / antiplatelet medications are generally held for 3-5 days.

- Warfarin, Plavix, Eliquis, etc...

EGD Patient Experience



Generally very easy with minimal patient discomfort.

- Fasting prior to procedure as directed
- IV placement to administer anesthesia
- Vital signs monitored continuously (heart rate, blood pressure, oxygen saturation levels throughout procedure)
- Anesthesia is provided: choice per physician (moderate sedation with low doses of narcotic and sedatives vs. monitored anesthesia care (MAC) with propofol- *preferred in most instances*).
- Air is inflated into the GI tract to allow visualization and the procedure is performed.
- Patient awakes within a few minutes afterwards generally without sore throat or pain (may have some bloating from gas)
- Needs a driver to take them home.



Post-operative discharge instructions are given to the patient and the driver both verbally and in writing with details on diet, restarting medications as well as prescriptions for any new medications.

Follow up patient care instructions are provided to resume normal daily activity as well as the need to make a follow up office visit to review any pathology results and to arrange for any further testing.

Colonoscopy Patient Experience



Generally well tolerated with minimal patient discomfort.

- Fasting the day prior to the procedure by drinking clear liquids and taking laxatives.
 - Multiple bowel preparation options available- should discuss with physician.
- IV placement to administer anesthesia
- Vital signs monitored continuously (heart rate, blood pressure, oxygen saturation levels throughout procedure).
- Anesthesia is provided: choice per physician (moderate sedation vs. MAC).
- Air is inflated into the GI tract to allow visualization and the procedure is performed.
- Patient awakes from procedure within a few minutes generally without pain (may have some bloating from gas)
- Needs a driver to take them home.

After Colonoscopy



Post operative instructions and follow up plans are discussed with the patient and the driver upon completion.



Contraindications for Procedures

EGD Contraindications



Patients unable to cooperate with examination despite the procedure despite adequate attempts at sedation/anesthesia.

Inability to obtain informed consent.

Presence of a suspected or known perforation of an organ.

Patient failing to follow dietary restrictions prior to the EGD (NPO status).

Colonoscopy Contraindications



Generally same as for EGD.

Inability to obtain informed consent, adequately sedate, suspected perforation or medical instability.



Potential Complications



Overall rare as these procedures are quite safe.

Complications related to:

- Sedation
- Preparation
- Directly related to the procedure.



Most common are cardiopulmonary complications.

Primarily affects:

- Elderly or frail patients
- Medical instability (low blood pressure, oxygen levels, etc...)
- Obesity.
- History of difficult airway management.



Holding antiplatelet therapy prior to procedures may increase risk for thromboembolic complications.

- CVA, PE, etc...

Bowel preparation for colonoscopy may lead to dehydration and possible electrolyte imbalances.

- Caution in patients with chronic renal insufficiency or concurrent diuretic use.

Complications During Procedures



Aspiration: swallowing gastric contents into lungs leading to pneumonia.

Bleeding: increased risk if biopsy or polyp removal performed during the procedure (especially if taking anticoagulation).

Perforation: tearing of the GI tract due to intervention which may require surgery.

Infection: patient related factors
(immunocompromised, diabetics, etc...)

Summary and Conclusions



Our research on general GI endoscopic procedures shows us that a gastroenterologist has a variety of procedures available to them.

All procedures require a careful evaluation and preparation.

While there are always some risks associated with procedures, they are generally very safe.

Acknowledgments



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Bibliography



<https://www.mayoclinic.org/tests-procedures/endoscopy/about/pac-20395197>

https://www.uptodate.com/contents/adverse-events-related-to-procedural-sedation-for-gastrointestinal-endoscopy?search=colonoscopy&topicRef=13927&source=see_link#H4149063999

https://www.uptodate.com/contents/bowel-preparation-before-colonoscopy-in-adults?search=colonoscopy&source=search_result&selectedTitle=2~150&usage_type=default&display_rank=2#H148492007

https://www.uptodate.com/contents/overview-of-colonoscopy-in-adults?search=colonoscopy&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1#H133249465

https://www.uptodate.com/contents/overview-of-upper-gastrointestinal-endoscopy-esophagogastroduodenoscopy?search=gi%20anatomy&usage_type=default&source=search_result&selectedTitle=1~150&display_rank=1#H6143287

https://www.uptodate.com/contents/overview-of-upper-gastrointestinal-endoscopy-esophagogastroduodenoscopy?search=EGD%20patient%20experience&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1#H1213982066

<https://healthengine.com.au/info/gastrointestinal-system>

<https://southern-gastro.com/>

https://www.uptodate.com/contents/management-of-anticoagulants-in-patients-undergoing-endoscopic-procedures?search=gi%20anatomy&topicRef=13928&source=see_link#H3610754384

<https://www.med.umich.edu/1libr/MPU/UpperEndoscopyPrep.pdf>

https://www.asge.org/docs/default-source/education/practice_guidelines/doc-5f63a8cf-9594-4e73-b206-7d48f5926dda.pdf?sfvrsn=d73a4a51_6

https://www.emedicinehealth.com/gastrointestinal_endoscopy/article_em.htm#how_do_you_prepare_for_a_gastrointestinal_endoscopy

<https://www.sages.org/publications/patient-information/patient-information-for-ercp-endoscopic-retrograde-cholangio-pancreatography-from-sages/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3831194/>

<https://academic.oup.com/jcag/advance-article/doi/10.1093/jcag/gwz016/5519702>

https://www.hopkinsmedicine.org/gastroenterology_hepatology/clinical_services/basic_endoscopy/esophagogastroduodenoscopy.html

https://www.uptodate.com/contents/overview-of-colonoscopy-in-adults?search=colonoscopy&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1#H133249352